JOINT RMIT AND CSIRO PARALLEL SYSTEMS ARCHITECTURE PROJECT

A Language and Compiler System for Specifying Timetable Requirements

D. Abramson

(RMIT refers to the Department of Communication and Electronic Engineering, Royal Melbourne Institute of Technology, Box 2476V, Melbourne VIC 3001 Australia)

Abstract

This paper describes a language and compiler for specifying school timetable constraints. The language allows specification using a high level notation. The compiler translates the description into the internal data structures required by a separate scheduling program. The paper describes the syntax and semantics of the language, and then gives some examples. The operation of the scheduler is described in a companion paper.

1. INTRODUCTION

Specifying timetable requirements and constraints can be a complex and time consuming task. In this paper a language is presented which allows easy specification of such requirements. Requirements are entered using a readable high level language. Constraints are also entered at the same time, together with various parameters which are used when the requirements are scheduled. In another paper a timetable scheduling algorithm is described [1]. This algorithm requires the timetable requirements to be specified in a low level coded format. A compiler has been developed which translates the high level description into the low level data. The compiler also checks the validity of timetable requests.

2. THE TIMETABLE PROBLEM

The problem of creating a valid timetable involves scheduling classes, teachers and rooms in such a way that no *teacher, class or room* is used more than once per period. The timetable is to be distributed across a fixed number of periods per week. A class consists of a number of students. We will assume that students have already been grouped into classes. Classes may either be disjoint, that is, they have *no students in common*, or may intersect with each other in arbitrary ways. In each period a class is taught a *subject*. It is possible for a subject to appear more than once in a period. A particular combination of a teacher, a subject, a room and a class is called an *element*. An element may be required more than once per week. The combination of an *element* and a frequency is called a *requirement*. Thus, the timetabling problem can be phrased as scheduling a number of requirements such that a requirement, teacher, class or room does not appear more than once per period. The task of forming requirements is handled separately and will not be discussed further.

3. TOOL SET

Timetable specifications are entered into a text file, and are manipulated using a conventional text editor. A compiler accepts specifications and creates a number of files, which are then used by a scheduling program. Syntax errors, and illegal requests are reported if the specification is in error. These must be corrected before the scheduler can be run.

The compiler translates all teacher, class, room and subject names into numeric data. A number of translation files are also emitted so that the numeric data can be later printed in symbolic form. A teacher, room and class usage report is also generated. This report gives the number of periods required by each teacher, room and class.

A pretty printer program generates timetable reports for all or selected teachers, classes, rooms and subjects. The pretty printer also performs room assignment where appropriate.

4. SPECIFICATION LANGUAGE

4.1 Timetable Structure and Basic Concepts

Each timetable specificaton must start with the following header:

TIMETABLE DATA nnn periods per day mmm days per week

and end with the following trailer:

END OF TIMETABLE

The timetable header indicates the number of periods per day, and the number of days per week. A timetable is assumed to be rectangular in shape. If some days contain more periods than others, then a timetable of equal length days must be specified, but some periods can be denoted as

unavailable to all teachers. All periods must be of equal length.

Periods can be specified by the position they occupy in the week, or by a day name followed by a relative number in the day. Periods are number in the week with first period Monday being period 1, and first period Tuesday being period nnn, where nnn is the number of periods per day. Period nnn * mmm is the last period of the week, where mmm is the number of days per week. If a day name is used, then it must be followed by a number if a single period is to be specified. If a range of periods is to be specified then it is permissible to use the day name alone. A range can also be specified by giving a starting period followed by the reserved word **through**, and another period.

Some examples are shown below:

Example	Meaning
1	Period 1 Monday
7	Period 7 Monday if there are 7 periods per day
Monday 4	Period 4 Monday
Tuesday	All periods of tuesday
1 through 7	All periods of Monday
Monday **through** Tuesday	All periods of Monday and Tuesday

Teachers, Rooms and Subjects are denoted by unique names. A name need only be unique within its own type, i.e. a teacher name must be unique, but may the same identifier as another room or subject identifier.
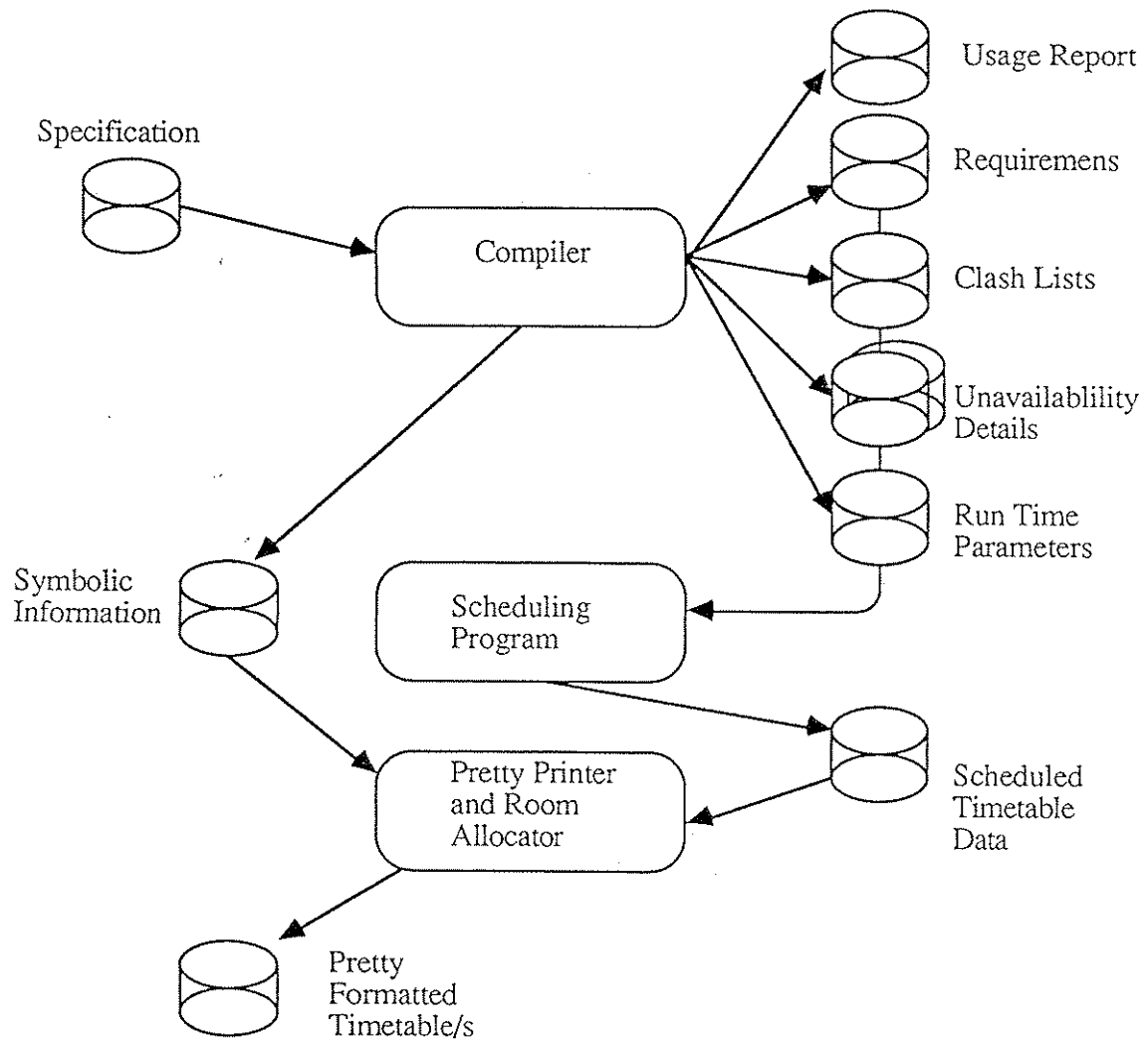

Figure 1 - Timetable Computation Tool Set

4.2 Requirements

The main input to the timetable compiler is a set of scheduling requirements. Each requirement specifies which class is to be taught, which subject they require, who should teach the subject, which room the class should be taught in (or set of plausible rooms), and how many times per week the class is required. A requirement can be specified using the following syntax:

Schedule {classid} **taught** {subjectid} **by** {teacherid} **in** {roomid} n **times**

Classid, subjectid, teacherid and roomid are alphanumeric identifiers that uniquely name a class, subject, teacher or room respectively. They may contain either numeric digits or alphabetic characters, but must start with an alphabetic character. A **schedule** statement is necessary for every requirement. An example of a legal requirement is:

Schedule Yr7a taught English **by** daa **in** EngRm1 5 **times**

Sometimes it is neccesary to request that some classes are <u>always</u> taught with other classes. For example, one may always want to teach Year 7 Art, and Year 7 Music at the same time. This desire can be expressed using one or more requirements linked with **Together with** clauses. The form of these requirements is:

Schedule {classid} **taught** {subjectid} **by** {teacherid} **in** {roomid} n **times**
Together with {classid} **taught** {subjectid} **by** {teacherid} **in** {roomid}
Together with {classid} **taught** {subjectid} **by** {teacherid} **in** {roomid}
Together with ....

Such requirements are called **grouped requirements** because they are always scheduled as a group. A grouped requirement must not contain any clashes. Grouped requirements are also useful because they reduce the number of rquirements that the scheduler has to place. In this case the scheduler knows that a collection can be placed together, and does not have to find such a grouping.

An example of a grouped requirement is shown below:

Schedule Year7a taught Art **by** da **in** ArtRoom 2 **times**
Together with Year7b taught Woodwork **by** bm **in** Woodroom
Together with Year7c taught Craft **by** jm **in** Room1a

It is often necessary to allocate classes in blocks of multiple periods. For example, it may be desirable to teach sport as a two period block, rather than two single periods. This information can be expressed using the **block** clause. A **block** clause can be added to a requirement, or a grouped requirement, in which case the block is applied to all requirements of the group. A block size is also specified to indicate how many periods are needed. For example,

Schedule Year7a taught Sport **by** da **in** Oval 2 **times block** 2

would request sport being taught to Year7a in one, two period block (i.e. 2 periods per week, but in 1 block).

Schedule Year7a taught Sport **by** da **in** Oval 5 **times block** 2

would request the same combination taught in two, two period blocks and a one period block. If more complex combinations are required then multiple schedule statements are required. For example, to request a block of 3 period and a block of 2 periods, two schedule statements are necessary.

Sometimes it is desirable to fix the time of a particular period. This can be done using the **fixed** clause, followed by a period descriptor. A **fixed** clause can follow a schedule statement, and if the requirement is grouped, the period will apply to all of the requirements of the group. Thus, the

following example:

>   Schedule Year7a taught Sport by da in Oval 1 times fixed 3

would allocate Year7a Sport to period 3. If a **fixed** statement is used then the requirement can only be scheduled once. If multiple periods per week are required then multiple schedule statements must be used.

An alternative to the **fixed** statement is the **with ... preference** statement. A **with ...** preference statement allows the timetabler to request that a requirement is scheduled in a particular period, or set of periods, but does allow the requirement to be placed in other periods. The statement accepts either a single period, a period range, or a set of periods or ranges separated by commas. An importance is also applied to the preference. Importance values may be **high** medium, and **low**. Thus, an example is:

>   Schedule Year7a taught Sport by da in Oval 1 times
>   with high preference for Monday 3

This example requests that the requirement be scheduled for 3rd period Monday. It will be assigned as close to Monday 3 as possible. The following example demonstrates the use of a set of periods:

>   Schedule Year7a taught Sport by da in Oval 1 times
>   with high preference for Monday , Tuesday 3 through 4

In this example, the requirement can be placed in any period monday, or periods 3 and 4 of Tuesday with equal preference. It is also possible to order preferences by using a greater than sign rather than a comma to separate periods. Thus, the following example indicates that the requirement can be placed in any period on Monday with equal preference, but also in periods 3 and 4 of Tuesday with slightly less preference.

>   Schedule Year7a taught Sport by da in Oval 1 times
>   with high preference for Monday > Tuesday 3 through 4

Both greater than sign delimiters and comma delimiters can be mixed in the one requirement **Preference** statements and **fixed** statements are mutually exclusive. Those periods which are specified in the preference list are recorded. All other periods are assigned preferences which decrease linearly proportional to their distance from the recorded periods. In this way a contour created in which a requirement will be placed as close as possible to the recorded periods. If the keyword **discreet** is placed after the preference period list, then the contour is discreet. Thus, the preference is not proportional to the distance from a recorded period. The preference of all no recorded periods is set lower than the period with the least preference.

Normally a requirment would contain a complete class, subject, teacher and room set. However it is possible to specify **nil** classes, teachers or rooms. This feature is useful for requirements which either do not contain a class, teacher or room, or for requirements which are part of a group. For example, if Year7 is split into a number of option classes which are taught simultaneously, grouped requirement can be specified. The class identifier can only be entered once, otherwise the group would contain clashes. The following declaration would achieve this requirement:

>   Schedule Year7 taught Art by da in ArtRoom 2 times
>   Together with nil taught Woodwork by bm in Woodroom
>   Together with nil taught Craft by jm in Room1a

Another example is when two teachers are required for a particular class. For example, year9 sport may require two teachers, but only one class and only one room. The following declaration would achieve this.

>   Schedule Year9 taught Sport by da in Gym 2 times

Together with nil taught Sport by bm in nil

4.3 Class Clashes

The discussion above assumes that classes are disjoint, that is, they have no students in common. This situation is generally true for classes in lower high shool, where the years are broken into segments, each of which can be scheduled indepently. However, in upper high school students below to more than one *class* because they choose subjects freely. For example, one student may be part of a Maths class (called M1), a Biology class (B1) and an English class (E1). Another student may be part of the same English class (E1), the same Biology class (B1), but a different Maths class (M2). This means that even though M1, B1 and E1 are different classes, they cannot be taught simultaneously because they contain a common student. Further, class M2 cannot be scheduled together with B1 and E1, but can be scheduled together with M1. This arrangement can be summarised by a Venn diagram, as shown below.

A special statment allows clash information to be recorded. The statement has the following form:

Class {class id} clashes with {class id} , {class id} , ...
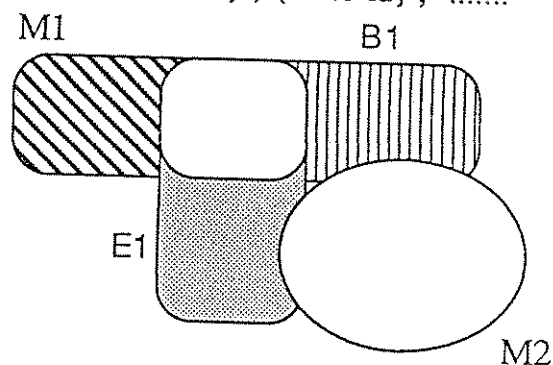
The following declarations capture this information.

```
Class M1 clashes with  E1,B1
Class E1 clashes with  B1
Class M2 clashes with  E1,B1
```

A further example is that of a year level which is split into three segments. Some subjects are taught to the entire year level, whereas most subjects are taught to individual segments. For example, Year 7 may have a morning assembly, but the years then splits into Year7a, Year7b and Year7c for individual subjects. Clearly, Years 7a,b and c are disjoint, and can be scheduled together freely,but Year7 cannot be scheduled with any of 7a,b or c. This situation can be coded as:

Class Year7 clashes with Year7a, Year7b, Year7c

4.4 Room Specification

The requirement structure given above allows a given class, subject and teacher to be scheduled in a particular room. In most schools there are a number of special purpose rooms, and the rest are roughly equivalent. The scheduling flexibility can be increased by allowing a class to be assigned to a particular room after the scheduling has been done. The scheduler only needs to know how many equivalent rooms are available in any period.

Room groups allow a room identifier to contain more than one room. Any requirement may name either a room identifier, or a room group identifier. The Room Group statement allows the room in a group to be declared. The general form is:

Room group {room id} contains {room id} , {room id} , ...

An example may be the subject science, which can be taught from any of three science rooms:

Room group science_rooms **contains** science1, science2, science3

Rooms which are part of a room group are assigned to requirements when the timetable is printed. At this time the user has the choice of which particular room to assign, whether the room should be assigned consistently to a requirement, or whether a random choice can be made.

A room may be listed in a room group and in a schedule statement. This rule increases significant flexibility in room assignment. For example, the subject Art may require the Art room. However, there may only be 3 Art classes per week, in which case the Art room would be idle for most of the week. Thus, the Art room may be used for other subjects if it is free and there are insufficient general rooms free in the period. This is illustrated by the following code:

Room group general_rooms **contains** artroom,craftroom,Rm1,Rm2,Rm3
Schedule Year7 **taught** Art **by** da **in** Artroom 2 **times**
Schedule Year8 **taught** English **by** ma **in** General_Rooms 1 **times**
Schedule Year9 **taught** Craft **by** ff **in** craftroom 2 **times**

At present, a room may be included in more than one room group (a main group and secondary group) providing all other rooms of the secondary group are named in the main room group. This is illustrated using the following code.

Room group art_rooms **contains** artroom1,craftroom1 {Secondary group}
Room group general_rooms **contains** artroom1,craftroom1,Rm1,Rm2,Rm3 {Main group}
Schedule Year7 **taught** Art **by** da **in** Art_Rooms 2 **times**
Schedule Year8 **taught** English **by** ma **in** General_Rooms 1 **times**
Schedule Year9 **taught** Craft **by** ff **in** craftroom1 2 **times**

However, the following code is illegal, because craftroom is only listed in secondary group, but room is in both groups:

Room group art_rooms **contains** artroom1,craftroom1 {Secondary group}
Room group general_rooms **contains** artroom1,Rm1,Rm2,Rm3 {Main group}

Room groups may not directly contain other room groups.

4.5 Unavailable Times

At times certain teachers and rooms are unavailable. It is possible to prevent requirements being assigned to periods in which the room or teacher is unavailable. The following declarations denote unavailable periods:

Teacher {teacher id} **unavailable** [{limits}] {period} | {period range} , [{limits}] {period} | {period range} ...
Room {room id} **unavailable** {period} | {period range} , {period} | {period range} ...

If a particular period is given, then the teacher or room is unavailable for that period. If a range given, then the teacher or room is unavailable for all of the periods in the range. More than one range may be given. The following examples illustrate the power of the unavailbility clause.

Teacher da **unavailable** 1,2,3,4
Room WoodWorkRoom **unavailable** Monday
Room WoodWorkRoom **unavailable** 1 through 3
Room WoodWorkRoom **unavailable** Monday through Tuesday 4

It is also possible to limit the number of times a teacher is scheduled over a period range. For example, it may be desirable to limit the number of classes a teacher takes in a day. This can be achieved by adding a **limits** clause to the **unavailable** clause. A **limits** clause has the following form:

... more than nnn times ....

The following example shows how the limits clause is used:

Teacher da unavailable more than 5 times Monday.

This statement would attempt to limit the number of times the teacher **da** was scheduled on Monday, but would not actually make the teacher unavailable. An **unavailable** clause may contain mixed periods and limits clauses. For example, the following statement would make the teacher unavailable on Monday, Wednesday period 3 and 4, and would only allow scheduling 3 or fewer times between first period Thursday and last period friday.

Teacher da unavailable   **Monday,**
Wednesday 3 through Wednesday 4,
more than 5 times Thursday through Friday.

4.7 Break Specifications

The timetable scheduler assumes that multiple periods should not be scheduled across day boundaries. It is also necessary that these periods are not assigned across lunch or other breaks. A **Breaks after** specifications allows the user to denote when breaks occur. It has the following form

Breaks after {period} , {period} ...

An example is:

Breaks after Monday 5, Tuesday 5, Wednesday 4

4.8 Scheduling Parameters

The scheduler requires a number of paramters before it can produce a timetable. These are specified using the **importance** clause, and the **cooling rate** clause. The **importance** clause informs the scheduler of the relative importance of the various constraints. The five main constraints are teacher clashes, class clashes, room clashes, multiple periods, scheduling preferences and teacher limits. If it is important that there are no clashes in any of these categories, then their importance should be high. Importance values are **high, medium, low,** and **nil.** The importance of a particular clash is given relative to other clashes. Thus, making the importance of all clashes **high** is equivalent to making them all **low.** It is also possible to give numeric importance values, in which case their relative values are used.

Examples of importance specifications are:

Importance of Classclashes is NIL
Importance of Teacherclashes is LOW
Importance of Roomclashes is MEDIUM
Importance of Blocks is HIGH
Importance of Preference is HIGH
Importance of Limits is HIGH

In this example class clashes are not considered important, teacher clashes are considered

unimportant, room clashes are moderately important and multiple period blocks should be allocated contiguously.

The **cooling rate** specification is used to control how long the scheduling algorithm searches for a solution. The value of the cooling rate must be > 0.1 and < 1.0. It must start with a decimal point. If the cooling rate is low, then a solution will be found quickly, but it may not be as good as a solution which is found slowly. For a full discussion on cooling rate the reader is referred to [1]. The clause also specifies how deeply the search is performed at each stage. A depth may be **verydeep, deep, medium, shallow** and **veryshallow**. An example of a **cooling rate** clause is:

Cooling rate is .9 depth is shallow

5. PRINTING TIMETABLES

The timetable compiler is also used for printing timetables. A print specification consists of

PRINT TIMETABLE {print commands}

and end with the following trailer:

END OF TIMETABLE

A number of print commands may be specified in the one file. The format of a print command is

FOR [CLASS IS {class id}]
     [SUBJECT IS {subject id}]
     [ROOM IS {room id}]
     [TEACHER IS {teacher id}]

Each print command may contain more than one occurrence of a class, teacher, subject or room request. A timetable is printed for those classes, teachers, subjects and rooms selected. If all entities are required, then the id should be replaced with the key word **ALL**.

If more than one **FOR** statement is present, then multiple timetables will be printed.

Some examples are shown below

PRINT TIMETABLE
    FOR   **Class is Yr11**
                 Subject is English
                 Room is ALL
                 Teacher is ALL

    FOR   **Class is ALL**
                 Teacher is ALL
                 Room is ALL
                 Subject is ALL

    FOR   **Class is Yr1a**
                 Class is Yr1b
                 Room is ALL
                 Teacher is ALL
                 Subject is ALL

    END OF TIMETABLE

6. SOME EXAMPLES

Below we show some sample input data, and some sample output reports. The first timetable is for a University faculty. It demonstrates the use of fixed requirements for those classes which are fixed by other faculties. The movable ones are then scheduled around the fixed ones. This data also demonstrates the use of preferences. Lectures are requested for the mornings, and practical classes for the afternoon. Further, it is preferable not to use the first and last periods of the day. The output shows that most of the preferences have been filled, but one practical class has been placed in the morning.

The second timetable is for a secondary school. This data has many different classes which clash with eachother. It also has grouped rooms. It should be noted that the science rooms are contained in more than one room group, and that some of the general rooms are named in requirements. This allows special purpose rooms to be used as general rooms if they are not in use. Grouped requirements are used extensively to reduce the number of objects. Without grouped requirements, the problem is too large to solve. This timetable is exteremely complex, and required a very slow, deep cooling cycle to solve.

6.1 Timetable 1

TIMETABLE DATA 9 periods per day 5 days per week

breaks after Monday 5, Tuesday 5, Wednesday 5, Thursday 5, Friday 5

(* the immovable items first *)
(* starting with maths *)
schedule yr1engA taught maths191_04 by nil in nil 1 times fixed Tuesday 2
schedule yr1engA taught maths191_04 by nil in nil 1 times fixed Friday 2
schedule yr1engB taught maths191_04 by nil in nil 1 times fixed Monday 5
schedule yr1engB taught maths191_04 by nil in nil 1 times fixed Wednesday 4
schedule yr1engB taught maths191_04 by nil in nil 1 times fixed Friday 4
schedule yr1engA taught maths191_04 by nil in nil 1 times fixed Monday 4
together with yr1engB taught maths191_04 by nil in nil
(* chemistry *)
schedule yr1engA taught chem171_04 by nil in nil 1 times fixed Monday 5
schedule yr1engA taught chem171_04 by nil in nil 1 times fixed Wednesday 4
schedule yr1engB taught chem171_04 by nil in nil 1 times fixed Monday 6
schedule yr1engB taught chem171_04 by nil in nil 1 times fixed Wednesday 6
schedule yr1engA taught chem171_04 by nil in nil 1 times fixed Tuesday 3
schedule yr1engA taught chem171_04 by nil in nil 1 times fixed Tuesday 4
schedule yr1engA taught chem171_04 by nil in nil 1 times fixed Tuesday 5

schedule yr1engB taught chem171_04 by nil in nil 1 times fixed Thursday 3
schedule yr1engB taught chem171_04 by nil in nil 1 times fixed Thursday 4
schedule yr1engB taught chem171_04 by nil in nil 1 times fixed Thursday 5
(* physics *)
schedule yr1engA taught phys181_04 by nil in nil 1 times fixed Monday 6
schedule yr1engB taught phys181_04 by nil in nil 1 times fixed Friday 6
schedule yr1engA taught phys181_04 by nil in nil 1 times fixed Tuesday 6
schedule yr1engA taught phys181_04 by nil in nil 1 times fixed Tuesday 7
schedule yr1engA taught phys181_04 by nil in nil 1 times fixed Tuesday 8
schedule yr1engA taught phys181_04 by nil in nil 1 times fixed Tuesday 9
schedule yr1engB taught phys181_04 by nil in nil 1 times fixed Thursday 6
schedule yr1engB taught phys181_04 by nil in nil 1 times fixed Thursday 7
schedule yr1engB taught phys181_04 by nil in nil 1 times fixed Thursday 8
schedule yr1engB taught phys181_04 by nil in nil 1 times fixed Thursday 9
(* combined degree specials *)
schedule yr1cscA taught maths191_04 by nil in nil 1 times fixed Monday 5
together with yr1cscB taught maths191_04 by nil in nil
schedule yr1cscA taught maths191_04 by nil in nil 1 times fixed Tuesday 5
together with yr1cscB taught maths191_04 by nil in nil
schedule yr1cscA taught maths191_04 by nil in nil 1 times fixed Wednesday 5
together with yr1cscB taught maths191_04 by nil in nil
schedule yr1cscA taught maths191_04 by nil in nil 1 times fixed Friday 5

together with yr1cscB taught maths191_04 by nil in nil
schedule yr1cscA taught compsci101 by nil in nil 1 times fixed Monday 4
together with yr1cscB taught compsci101 by nil in nil
schedule yr1cscA taught compsci101 by nil in nil 1 times fixed Tuesday 3
together with yr1cscB taught compsci101 by nil in nil
schedule yr1cscA taught compsci101 by nil in nil 1 times fixed Thursday 4
together with yr1cscB taught compsci101 by nil in nil
schedule yr1cscA taught phys181_04 by nil in nil 1 times fixed Tuesday 4
together with yr1cscB taught phys181_04 by nil in nil
schedule yr1cscA taught phys181_04 by nil in nil 1 times fixed Wednesday 4
together with yr1cscB taught phys181_04 by nil in nil
schedule yr1cscA taught phys181_04 by nil in nil 1 times fixed Friday 4
together with yr1cscB taught phys181_04 by nil in nil
schedule yr1chmA taught chem171_04 by nil in nil 1 times fixed Tuesday 4
together with yr1chmB taught chem171_04 by nil in nil
schedule yr1chmA taught chem171_04 by nil in nil 1 times fixed Wednesday 4
together with yr1chmB taught chem171_04 by nil in nil
schedule yr1chmA taught chem171_04 by nil in nil 1 times fixed Friday 4
together with yr1chmB taught chem171_04 by nil in nil
schedule yr1chmA taught maths191_04 by nil in nil 1 times fixed Monday 6
together with yr1chmB taught maths191_04 by nil in nil
schedule yr1chmA taught maths191_04 by nil in nil 1 times fixed Tuesday 6
together with yr1chmB taught maths191_04 by nil in nil
schedule yr1chmA taught maths191_04 by nil in nil 1 times fixed Thursday 6
together with yr1chmB taught maths191_04 by nil in nil
schedule yr1chmA taught maths191_04 by nil in nil 1 times fixed Friday 6
together with yr1chmB taught maths191_04 by nil in nil
schedule yr1chmA taught phys181_04 by nil in nil 1 times fixed Monday 4
together with yr1chmB taught phys181_04 by nil in nil
schedule yr1chmA taught phys181_04 by nil in nil 1 times fixed Thursday 3
schedule yr1chmA taught phys181_04 by nil in nil 1 times fixed Thursday 4
schedule yr1chmA taught phys181_04 by nil in nil 1 times fixed Thursday 5
together with yr1chmB taught phys181_04 by nil in nil
(* at last, the engineers_ *)
(* these constraints are for combined degree people *)
schedule yr1cscB taught eng1 by nil in DO3 1 times fixed Wednesday 6
schedule yr1cscB taught eng1 by nil in DO3 1 times fixed Wednesday 7
schedule yr1cscB taught eng1 by nil in DO3 1 times fixed Wednesday 8
schedule yr1cscB taught eng1 by nil in DO3 1 times fixed Wednesday 9
together with yr1chmB taught eng1 by nil in nil
schedule yr1cscA taught eng1 by nil in nil 1 times fixed Wednesday 6
schedule yr1cscA taught eng1 by nil in nil 1 times fixed Wednesday 7
schedule yr1cscA taught eng1 by nil in nil 1 times fixed Wednesday 8
schedule yr1cscA taught eng1 by nil in nil 1 times fixed Wednesday 9
together with yr1chmA taught eng1 by nil in nil
(* finally, the disposable part! *)
schedule yr1engA taught eng111_04 by nil in E1 2 times
with low preference for   Monday 2 through Monday 5,
                                 Tuesday 2 through Tuesday 5,
                                 Wednesday 2 through Wednesday 5,
                                 Thursday 2 through Thursday 5,
                                 Friday 2 through Friday 5
together with yr1cscA taught eng111_04 by nil in nil
together with yr1chmA taught eng111_04 by nil in nil

schedule yr1engA taught eng111_04prac by nil in nil 2 times
with low preference for   Monday 6 through Monday 8,
                                 Tuesday 6 through Tuesday 8,
                                 Wednesday 6 through Wednesday 8,
                                 Thursday 6 through Thursday 8,
                                 Friday 6 through Friday 8   block 2
together with yr1cscA taught eng111_04prac by nil in nil
together with yr1chmA taught eng111_04prac by nil in nil

schedule yr1engA taught eng121_04 by nil in E1 2 times
with low preference for   Monday 2 through Monday 5,
                                 Tuesday 2 through Tuesday 5,
                                 Wednesday 2 through Wednesday 5,
                                 Thursday 2 through Thursday 5,
                                 Friday 2 through Friday 5
together with yr1cscA taught eng121_04 by nil in nil
together with yr1chmA taught eng121_04 by nil in nil

schedule yr1engA taught eng121_04prac by nil in DO3 2 times
with low preference for   Monday 6 through Monday 8,
                                 Tuesday 6 through Tuesday 8,
                                 Wednesday 6 through Wednesday 8,
                                 Thursday 6 through Thursday 8,
                                 Friday 6 through Friday 8   block 2
together with yr1cscA taught eng121_04prac by nil in DO4
together with yr1chmA taught eng121_04prac by nil in nil

schedule yr1engA taught eng131_04 by nil in E1 2 times
with low preference for   Monday 2 through Monday 5,
                                 Tuesday 2 through Tuesday 5,
                                 Wednesday 2 through Wednesday 5,
                                 Thursday 2 through Thursday 5,
                                 Friday 2 through Friday 5
together with yr1cscA taught eng131_04 by nil in nil
together with yr1chmA taught eng131_04 by nil in nil

schedule yr1engA taught eng131_04prac by nil in DO3 2 times
with low preference for   Monday 6 through Monday 8,
                                 Tuesday 6 through Tuesday 8,
                                 Wednesday 6 through Wednesday 8,
                                 Thursday 6 through Thursday 8,
                                 Friday 6 through Friday 8   block 2
together with yr1cscA taught eng131_04prac by nil in DO4
together with yr1chmA taught eng131_04prac by nil in nil

schedule yr1engB taught eng141_04 by nil in E1 2 times
with low preference for   Monday 2 through Monday 5,
                                 Tuesday 2 through Tuesday 5,
                                 Wednesday 2 through Wednesday 5,
                                 Thursday 2 through Thursday 5,
                                 Friday 2 through Friday 5
together with yr1cscB taught eng141_04 by nil in nil
together with yr1chmB taught eng141_04 by nil in nil

schedule yr1engA taught eng141_04prac by nil in DO3 2 times
with low preference for   Monday 6 through Monday 8,
                                 Tuesday 6 through Tuesday 8,
                                 Wednesday 6 through Wednesday 8,
                                 Thursday 6 through Thursday 8,
                                 Friday 6 through Friday 8   block 2
together with yr1cscA taught eng141_04prac by nil in DO4
together with yr1chmA taught eng141_04prac by nil in nil

schedule yr1engB taught eng151_04 by nil in E1 2 times
with low preference for   Monday 2 through Monday 5,
                                 Tuesday 2 through Tuesday 5,
                                 Wednesday 2 through Wednesday 5,
                                 Thursday 2 through Thursday 5,
                                 Friday 2 through Friday 5
together with yr1cscB taught eng151_04 by nil in nil
together with yr1chmB taught eng151_04 by nil in nil

schedule yr1engB taught eng151_04prac by nil in DO3 2 times

with low preference for   Monday 6 through Monday 8,
                                 Tuesday 6 through Tuesday 8,
                                 Wednesday 6 through Wednesday 8,
                                 Thursday 6 through Thursday 8,
                                 Friday 6 through Friday 8   block 2
together with yr1cscB taught eng151_04prac by nil in DO4
together with yr1chmB taught eng151_04prac by nil in nil

schedule yr1engB taught eng161_04 by nil in E1 2 times
with low preference for   Monday 2 through Monday 5,
                                 Tuesday 2 through Tuesday 5,
                                 Wednesday 2 through Wednesday 5,
                                 Thursday 2 through Thursday 5,
                                 Friday 2 through Friday 5
together with yr1cscB taught eng161_04 by nil in nil
together with yr1chmB taught eng161_04 by nil in nil

schedule yr1engB taught eng161_04prac by nil in nil 2 times
with low preference for   Monday 6 through Monday 8,
                                 Tuesday 6 through Tuesday 8,
                                 Wednesday 6 through Wednesday 8,
                                 Thursday 6 through Thursday 8,
                                 Friday 6 through Friday 8
together with yr1cscB taught eng161_04prac by nil in nil
together with yr1chmB taught eng161_04prac by nil in nil

cooling rate is .9 depth is medium

Importance of Classclashes is 5
Importance of Teacherclashes is 5
Importance of Roomclashes is 5
Importance of Blocks is 4
Importance of preference is 1

END OF TIMETABLE

Monday		Class	Subject	Teacher	Room
2		YR1ENGA	ENG111_04		E1
	->	YR1CSCA	ENG111_04		
	->	YR1CHMA	ENG111_04		
3		YR1ENGA	ENG121_04		E1
	->	YR1CSCA	ENG121_04		
	->	YR1CHMA	ENG121_04		
4		YR1CSCA	COMPSCI101		
	->	YR1CSCB	COMPSCI101		
		YR1CHMA	PHYS181_04		
	->	YR1CHMB	PHYS181_04		
		YR1ENGA	MATHS191_04		
	->	YR1ENGB	MATHS191_04		
5		YR1CSCA	MATHS191_04		
	->	YR1CSCB	MATHS191_04		
		YR1ENGB	MATHS191_04		
		YR1ENGA	CHEM171_04		
6		YR1ENGA	PHYS181_04		
		YR1CHMA	MATHS191_04		
	->	YR1CHMB	MATHS191_04		
		YR1ENGB	CHEM171_04		
7		YR1ENGA	ENG111_04PRAC		
	->	YR1CSCA	ENG111_04PRAC		
	->	YR1CHMA	ENG111_04PRAC		
		YR1ENGB	ENG151_04PRAC		DO3
	->	YR1CSCB	ENG151_04PRAC		DO4
	->	YR1CHMB	ENG151_04PRAC		
8		YR1ENGA	ENG111_04PRAC		
	->	YR1CSCA	ENG111_04PRAC		
	->	YR1CHMA	ENG111_04PRAC		
		YR1ENGB	ENG151_04PRAC		DO3
	->	YR1CSCB	ENG151_04PRAC		DO4
	->	YR1CHMB	ENG151_04PRAC		

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Tuesday		Class	Subject	Teacher	Room	
1		YR1ENGA	ENG131_04		E1	Pref
	->	YR1CSCA	ENG131_04			
	->	YR1CHMA	ENG131_04			
2		YR1ENGB	ENG161_04		E1	
	->	YR1CSCB	ENG161_04			
	->	YR1CHMB	ENG161_04			
		YR1ENGA	MATHS191_04			
3		YR1CSCA	COMPSCI101			
	->	YR1CSCB	COMPSCI101			
		YR1ENGA	CHEM171_04			
4		YR1CSCA	PHYS181_04			
	->	YR1CSCB	PHYS181_04			
		YR1CHMA	CHEM171_04			
	->	YR1CHMB	CHEM171_04			
		YR1ENGA	CHEM171_04			
5		YR1ENGA	CHEM171_04			
		YR1CSCA	MATHS191_04			
	->	YR1CSCB	MATHS191_04			
6		YR1ENGA	PHYS181_04			
		YR1CHMA	MATHS191_04			
	->	YR1CHMB	MATHS191_04			
7		YR1ENGA	PHYS181_04			
8		YR1ENGA	PHYS181_04			
9		YR1ENGA	PHYS181_04			

Wednesday						
		Class	Subject	Teacher	Room	
1		YR1ENGB	ENG141_04		E1	Pref
	->	YR1CSCB	ENG141_04			
	->	YR1CHMB	ENG141_04			
		YR1ENGA	ENG141_04PRAC		DO3	Pref
	->	YR1CSCA	ENG141_04PRAC		DO4	
	->	YR1CHMA	ENG141_04PRAC			
2		YR1ENGA	ENG141_04PRAC		DO3	Pref
	->	YR1CSCA	ENG141_04PRAC		DO4	
	->	YR1CHMA	ENG141_04PRAC			
		YR1ENGB	ENG151_04		E1	
	->	YR1CSCB	ENG151_04			
	->	YR1CHMB	ENG151_04			
3		YR1ENGA	ENG111_04		EI	
	->	YR1CSCA	ENG111_04			
	->	YR1CHMA	ENG111_04			
4		YR1CSCA	PHYS181_04			
	->	YR1CSCB	PHYS181_04			
		YR1CHMA	CHEM171_04			
	->	YR1CHMB	CHEM171_04			
		YR1ENGB	MATHS191_04			
		YR1ENGA	CHEM171_04			
5		YR1CSCA	MATHS191_04			
	->	YR1CSCB	MATHS191_04			
6		YR1CSCB	ENG1		DO3	
		YR1CSCA	ENG1			
		YR1ENGB	CHEM171_04			
7		YR1CSCB	ENG1		DO3	
		YR1CSCA	ENG1			
8		YR1CSCB	ENG1		DO3	
		YR1CSCA	ENG1			
9		YR1CSCB	ENG1		DO3	
	->	YR1CHMB	ENG1			
		YR1CSCA	ENG1			
	->	YR1CHMA	ENG1			

Thursday		Class	Subject	Teacher	Room	
1		YR1ENGB	ENG161_04		E1	Pref
	->	YR1CSCB	ENG161_04			
	->	YR1CHMB	ENG161_04			
2		YR1ENGB	ENG141_04		E1	
	->	YR1CSCB	ENG141_04			
	->	YR1CHMB	ENG141_04			
3		YR1ENGB	CHEM171_04			
		YR1CHMA	PHYS181_04			
4		YR1ENGB	CHEM171_04			
		YR1CSCA	COMPSCI101			
	->	YR1CSCB	COMPSCI101			
		YR1CHMA	PHYS181_04			
5		YR1ENGB	CHEM171_04			
		YR1CHMA	PHYS181_04			
	->	YR1CHMB	PHYS181_04			
6		YR1ENGB	PHYS181_04			
		YR1CHMA	MATHS191_04			
	->	YR1CHMB	MATHS191_04			
7		YR1ENGA	ENG121_04PRAC		DO3	
	->	YR1CSCA	ENG121_04PRAC		DO4	
	->	YR1CHMA	ENG121_04PRAC			
		YR1ENGB	PHYS181_04			
8		YR1ENGA	ENG121_04PRAC		DO3	
	->	YR1CSCA	ENG121_04PRAC		DO4	
	->	YR1CHMA	ENG121_04PRAC			
		YR1ENGB	PHYS181_04			
9		YR1ENGB	PHYS181_04			

Friday					
		Class	Subject	Teacher	Room
1		YR1ENGA	ENG121_04		E1 Pref
	->	YR1CSCA	ENG121_04		
	->	YR1CHMA	ENG121_04		
2		YR1ENGB	ENG151_04		E1
	->	YR1CSCB	ENG151_04		
	->	YR1CHMB	ENG151_04		
		YR1ENGA	MATHS191_04		
3		YR1ENGA	ENG131_04		E1
	->	YR1CSCA	ENG131_04		
	->	YR1CHMA	ENG131_04		
4		YR1CSCA	PHYS181_04		
	->	YR1CSCB	PHYS181_04		
		YR1CHMA	CHEM171_04		
	->	YR1CHMB	CHEM171_04		
		YR1ENGB	MATHS191_04		
5		YR1CSCA	MATHS191_04		
	->	YR1CSCB	MATHS191_04		
6		YR1ENGB	PHYS181_04		
		YR1CHMA	MATHS191_04		
	->	YR1CHMB	MATHS191_04		
7		YR1ENGA	ENG131_04PRAC		DO3
	->	YR1CSCA	ENG131_04PRAC		DO4
	->	YR1CHMA	ENG131_04PRAC		
:		YR1ENGB	ENG161_04PRAC		
	->	YR1CSCB	ENG161_04PRAC		
	->	YR1CHMB	ENG161_04PRAC		
8		YR1ENGA	ENG131_04PRAC		DO3
	->	YR1CSCA	ENG131_04PRAC		DO4
	->	YR1CHMA	ENG131_04PRAC		
		YR1ENGB	ENG161_04PRAC		
	->	YR1CSCB	ENG161_04PRAC		
	->	YR1CHMB	ENG161_04PRAC		

6.2 Timetable 2

Timetable Data 6 periods per day 5 days per week
Schedule Yr10a Taught cra By jg In gr 1 Times
Schedule Yr10a Taught ena By jh In genrm 5 Times
Schedule Yr10a Taught maa By ac In genrm 3 Times
Together with Yr10b Taught mab By ag In genrm
Together with Yr10c Taught mac By rz In genrm
Schedule Yr10a Taught sca By mg In science 3 Times
Together with Yr10b Taught scb By ag In science
Together with Yr10c Taught scc By bh In science
Schedule Yr10b Taught crb By jg In gr 1 Times
Schedule Yr10b Taught enb By hl In genrm 5 Times
Schedule Yr10c Taught crc By jg In gr 1 Times
Schedule Yr10c Taught enc By dc In genrm 5 Times
Schedule Yr10d Taught emb By bh In genrm 3 Times
Together With Yr10e Taught dr By dc In genrm
Together With Yr10f Taught gnr By gf In genrm
Schedule Yr10g Taught tyb By nm In genrm 3 Times
Together With Yr10h Taught gel By ac In genrm
Together With Yr10i Taught enw By md In genrm
Schedule Yr10j Taught pe By as In genrm 1 Times
Together With Yr10k Taught has By sh In genrm
Together With Yr10l Taught tex By gc In nw
Schedule Yr10j Taught pe By as In gym 2 Times
Together With Yr10k Taught has By sh In genrm
Together With Yr10l Taught tex By gc In nw
Schedule Yr10m Taught tya By nm In genrm 2 Times
Together With Yr10n Taught hlh By sh In genrm
Together With Yr10o Taught ww By ax In ww
Together With Yr10p Taught pe By as In gym
Schedule Yr10m Taught tya By nm In genrm 1 Times
Together With Yr10n Taught hlh By sh In genrm
Together With Yr10o Taught ww By ax In ww
Together With Yr10p Taught pe By as In genrm
Schedule Yr10q Taught ema By sc In genrm 3 Times
Together With Yr10r Taught ger By dj In genrm
Together With Yr10s Taught csa By rz In genrm
Together With Yr10t Taught art By lm In ar
Schedule Yr10u Taught csa By ja In genrm 3 Times
Together With Yr10v Taught bkp By ts In genrm
Together With Yr10w Taught hec By cr In dr
Together With Yr10x Taught gra By bm In gr
Schedule Yr111 Taught psa By mb In genrm 1 Times
Together With Yr112 Taught psb By mjd In genrm
Schedule Yr11a Taught ena By sj In genrm 5 Times
Schedule Yr11b Taught enb By jh In genrm 5 Times
Schedule Yr11c Taught enc By dc In genrm 5 Times
Schedule Yr11d Taught ch By kr In genrm 1 Times
Schedule Yr11d Taught ch By kr In science 3 Times
Schedule Yr11e Taught pe By as In gym 2 Times
Schedule Yr11e Taught pe By mb In genrm 2 Times
Schedule Yr11g Taught hi By th In genrm 4 Times
Schedule Yr11h Taught bio By rz In genrm 2 Times
Schedule Yr11h Taught bio By rz In science 2 Times
Schedule Yr11i Taught ls By pt In genrm 4 Times
Schedule Yr11j Taught mab By sc In genrm 4 Times
Together With Yr11k Taught lit By dj In genrm
Together With Yr111 Taught eco By pt In genrm
Together With Yr11m Taught gra By bm In gr
Schedule Yr11n Taught ph By dm In science 4 Times
Together With Yr11o Taught mco By ci In genrm
Together With Yr11p Taught mag By mg In genrm
Together With Yr11q Taught mal By ag In genrm
Schedule Yr11r Taught lan By ar In genrm 2 Times
Schedule Yr11s Taught cpr By ja In genrm 2 Times
Together With Yr11t Taught tex By cr In nw
Together With Yr11u Taught pde By gf In genrm
Together with Yr11v Taught pde By ax In nil
Schedule Yr11s Taught cpr By ja In genrm 2 Times
Together With Yr11t Taught tex By cr In nw
Together With Yr11u Taught pde By gf In genrm
Schedule Yr11w Taught ma2 By bh In genrm 4 Times
Together With Yr11x Taught acc By nm In genrm
Together With Yr11y Taught art By lm In ar
Together With Yr11z Taught ag By ja In genrm
Schedule Yr12a Taught ena By jg In genrm 5 Times
Together With Yr12b Taught enb By md In genrm
Schedule Yr12c Taught maa By sc In genrm 5 Times
Together With Yr12d Taught hau By sh In genrm
Schedule Yr12e Taught bio By ag In science 5 Times
Together With Yr12f Taught sec By eh In genrm
Together With Yr12g Taught lit By dj In genrm
Schedule Yr12h Taught mab By bh In genrm 5 Times
Together With Yr12i Taught acc By nm In genrm
Together With Yr12j Taught art By lm In ar
Together With Yr12k Taught cc By sj In genrm
Together With Yr12l Taught geo By ac In genrm
Schedule Yr12m Taught ch By ci In science 5 Times
Together With Yr12n Taught pe By mm In genrm
Together With Yr12o Taught ls By nm In genrm
Schedule Yr12p Taught eco By pt In genrm 5 Times
Together With Yr12q Taught ph By dm In science
Together With Yr12r Taught heu By ar In genrm
Together With Yr12s Taught hds By gc In genrm
Schedule Yr7a Taught ena By jh In genrm 5 Times
Together with Yr7b Taught enb By jg In genrm

Together with Yr7c Taught enc By hl In genrm
Schedule Yr7a Taught gea By hl In genrm 2 Times
Schedule Yr7a Taught hia By sj In genrm 2 Times
Schedule Yr7a Taught laa By ar In genrm 2 Times
Schedule Yr7a Taught maa By mg In genrm 4 Times
Schedule Yr7a Taught mu By lh In genrm 2 Times
Schedule Yr7a Taught pea By mm In genrm 1 Times
Schedule Yr7a Taught pea By mm In gym 2 Times

Together with Yr7d Taught end By dc In genrm

block 2
Together with Yr7b Taught peb By mb In gym
Schedule Yr7a Taught sca By kr In science 3 Times
Schedule Yr7a Taught ssa By hl In genrm 2 Times
Schedule Yr7b Taught geb By ca In genrm 2 Times
Schedule Yr7b Taught hib By th In genrm 2 Times
Schedule Yr7b Taught lab By ar In genrm 2 Times
Schedule Yr7b Taught mab By sc In genrm 4 Times
Schedule Yr7b Taught mu By lh In genrm 2 Times
Schedule Yr7b Taught peb By mb In genrm 1 Times
Schedule Yr7b Taught scb By kr In science 3 Times
Schedule Yr7b Taught ssb By hl In genrm 2 Times
Schedule Yr7c Taught csa By ja In genrm 1 Times
Schedule Yr7c Taught csc By ja In genrm 1 Times
Schedule Yr7c Taught gec By ca In genrm 2 Times
Schedule Yr7c Taught hic By sj In genrm 2 Times
Schedule Yr7c Taught lac By ar In genrm 2 Times
Schedule Yr7c Taught mac By mb In genrm 4 Times
Schedule Yr7c Taught pec By as In genrm 1 Times
Schedule Yr7c Taught pec By as In gym 2 Times
Schedule Yr7c Taught scc By mg In science 3 Times
Schedule Yr7c Taught ssc By pt In genrm 2 Times
Schedule Yr7d Taught csa By dm In genrm 2 Times
Schedule Yr7d Taught ged By ca In genrm 2 Times
Schedule Yr7d Taught hid By th In genrm 2 Times
Schedule Yr7d Taught lad By ar In genrm 2 Times
Schedule Yr7d Taught mad By ag In genrm 4 Times
Schedule Yr7d Taught ped By mm In genrm 1 Times
Schedule Yr7d Taught ped By mm In gym 2 Times
Schedule Yr7d Taught scd By mg In science 3 Times
Schedule Yr7d Taught ssd By hl In genrm 2 Times
Schedule Yr7e Taught art By lm In ar 4 Times
Together With Yr7g Taught tex By gc In nw
Schedule Yr7e Taught art By lm In ar 1 Times
Together With Yr7g Taught tex By cr In nw

Together With Yr7f Taught cer By ax In ce
Together With Yr7h Taught ww By bm In ww
Together With Yr7f Taught cer By ax In ce
Together With Yr7h Taught ww By bm In ww

Schedule Yr8a Taught ena By md In genrm 5 Times
Together with Yr8c Taught enc By mjd In genrm

Together with Yr8b Taught enb By jh In genrm

Schedule Yr8a Taught gea By mb In genrm 2 Times
Schedule Yr8a Taught csa By bh In genrm 1 Times
Schedule Yr8a Taught hia By th In genrm 2 Times
Schedule Yr8a Taught maa By kr In genrm 4 Times
Schedule Yr8a Taught pea By mm In genrm 1 Times
Schedule Yr8a Taught sca By rz In science 4 Times
Schedule Yr8a Taught ssa By pt In genrm 2 Times

Schedule Yr8a Taught pea By mm In gym 2 Times block 2
Together with Yr8b Taught peb By as In gym

Schedule Yr8b Taught csa By mg In genrm 1 Times
Schedule Yr8b Taught geb By mb In genrm 2 Times
Schedule Yr8b Taught hib By th In genrm 2 Times
Schedule Yr8b Taught mab By bh In genrm 4 Times
Schedule Yr8b Taught peb By as In genrm 1 Times
Schedule Yr8b Taught scb By ci In science 4 Times

Schedule Yr8b Taught ssb By pt In genrm 2 Times

Schedule Yr8c Taught csa By bh In genrm 1 Times
Schedule Yr8c Taught gec By mb In genrm 2 Times
Schedule Yr8c Taught hic By th In genrm 2 Times
Schedule Yr8c Taught mac By ci In genrm 4 Times
Schedule Yr8c Taught pec By mb In genrm 1 Times
Schedule Yr8c Taught pec By mb In gym 2 Times
Schedule Yr8c Taught scc By rz In science 4 Times
Schedule Yr8c Taught ssc By pt In genrm 2 Times
Schedule Yr8d Taught cer By ax In ce 2 Times   Together With Yr8e Taught ww By bm In ww
Together With Yr8f Taught hec By gc In dr   Together With Yr8g Taught tex By cr In nw
Schedule Yr8d Taught cer By ax In ce 2 Times   Together With Yr8e Taught ww By bm In ww
Together With Yr8f Taught hec By lm In dr   Together With Yr8g Taught tex By cr In nw
Schedule Yr8h Taught ge1 By ar In genrm 1 Times   Together with Yr8i Taught ge2 By dj In genrm
Together with Yr8j Taught hor By ja In genrm   Together with Yr8k Taught mu By lh In genrm
Together with Yr8l Taught psk By ag In genrm
Schedule Yr8h Taught ge1 By ar In genrm 1 Times   Together with Yr8i Taught ge2 By dj In genrm
Together with Yr8j Taught hor By ja In genrm   Together with Yr8k Taught mu By lh In genrm
Together with Yr8l Taught psk By jh In genrm
Schedule Yr8h Taught ge1 By dj In genrm 1 Times   Together with Yr8i Taught ge2 By ar In genrm
Together with Yr8j Taught hor By ja In genrm   Together with Yr8k Taught mu By lh In genrm
Together with Yr8l Taught psk By mm In genrm
Schedule Yr9a Taught ena By dj In genrm 5 Times
Schedule Yr9a Taught gea By ac In genrm 3 Times
Schedule Yr9a Taught hia By th In genrm 3 Times
Schedule Yr9a Taught maa By sc In genrm 4 Times
Schedule Yr9a Taught pea By as In genrm 1 Times
Schedule Yr9a Taught pea By as In gym 2 Times
Schedule Yr9a Taught sca By rz In science 3 Times
Schedule Yr9a Taught tya By eh In genrm 3 Times
Schedule Yr9b Taught enb By md In genrm 5 Times
Schedule Yr9b Taught geb By eh In genrm 3 Times
Schedule Yr9b Taught hib By dc In genrm 3 Times
Schedule Yr9b Taught mab By ci In genrm 4 Times
Schedule Yr9b Taught peb By as In genrm 1 Times
Schedule Yr9b Taught peb By as In gym 2 Times
Schedule Yr9b Taught scb By dm In science 3 Times
Schedule Yr9b Taught tyb By eh In genrm 3 Times
Schedule Yr9c Taught enc By sj In genrm 5 Times
Schedule Yr9c Taught gec By ac In genrm 3 Times
Schedule Yr9c Taught hic By hl In genrm 3 Times
Schedule Yr9c Taught mac By kr In genrm 4 Times
Schedule Yr9c Taught pec By mm In genrm 1 Times
Schedule Yr9c Taught pec By mm In gym 2 Times
Schedule Yr9c Taught scc By kr In science 3 Times
Schedule Yr9c Taught tyc By eh In genrm 3 Times
Schedule Yr9d Taught ger By ar In genrm 3 Times   Together With Yr9e Taught hor By dm In science
Together With Yr9f Taught tex By cr In nw   Together With Yr9g Taught ww By ax In ww
Schedule Yr9h Taught ww By bm In ww 3 Times   Together With Yr9i Taught hec By gc In dr
Together With Yr9j Taught tex By cr In nw   Together With Yr9k Taught cer By ax In ce

ROOMGROUP science CONTAINS sa,sb,sc
ROOMGROUP gym CONTAINS gy1,gy2
ROOMGROUP genrm CONTAINS Rm1,Rm2,Rm3,Rm4,Rm5,Rm6,Rm7,Rm8,Rm9,Rm10,Rm11,LF,
                         Rm13,Rm14,ce,nw,dr,ar,gr,sa,sb,sc

Class Yr7a clashes with Yr7e,Yr7f,Yr7g,Yr7h
Class Yr7b clashes with Yr7e,Yr7f,Yr7g,Yr7h
Class Yr7c clashes with Yr7e,Yr7f,Yr7g,Yr7h
Class Yr7d clashes with Yr7e,Yr7f,Yr7g,Yr7h
Class Yr8a clashes with Yr8d,Yr8e,Yr8f,Yr8g,Yr8h,Yr8i,Yr8j,Yr8k,Yr8l
Class Yr8b clashes with Yr8d,Yr8e,Yr8f,Yr8g,Yr8h,Yr8i,Yr8j,Yr8k,Yr8l
Class Yr8c clashes with Yr8d,Yr8e,Yr8f,Yr8g,Yr8h,Yr8i,Yr8j,Yr8k,Yr8l

Class Yr8d clashes with Yr8h,Yr8i,Yr8j,Yr8,Yr8l
Class Yr8e clashes with Yr8h,Yr8i,Yr8j,Yr8k,Yr8l
Class Yr8f clashes with Yr8h,Yr8i,Yr8j,Yr8k,Yr8l
Class Yr8g clashes with Yr8h,Yr8i,Yr8j,Yr8k,Yr8l
Class Yr9a clashes with Yr9d,Yr9e,Yr9f,Yr9g,Yr9h,Yr9i,Yr9j,Yr9k
Class Yr9b clashes with Yr9d,Yr9e,Yr9f,Yr9g,Yr9h,Yr9i,Yr9j,Yr9k
Class Yr9c clashes with Yr9d,Yr9e,Yr9f,Yr9g,Yr9h,Yr9i,Yr9j,Yr9k
Class Yr9d clashes with Yr9h,Yr9i,Yr9j,Yr9k
Class Yr9e clashes with Yr9h,Yr9i,Yr9j,Yr9k
Class Yr9f clashes with Yr9h,Yr9i,Yr9j,Yr9k
Class Yr9g clashes with Yr9h,Yr9i,Yr9j,Yr9k
Class Yr10a clashes with Yr10d,Yr10e,Yr10f,Yr10g,Yr10h,Yr10i,Yr10j,Yr10k,Yr10l,
    Yr10m,Yr10n,Yr10o,Yr10p,Yr10q,Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10b clashes with Yr10d,Yr10e,Yr10f,Yr10g,Yr10h,Yr10i,Yr10j,Yr10k,Yr10l,
    Yr10m,Yr10n,Yr10o,Yr10p,Yr10q,Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10c clashes with Yr10d,Yr10e,Yr10f,Yr10g,Yr10h,Yr10i,Yr10j,Yr10k,Yr10l,
    Yr10m,Yr10n,Yr10o,Yr10p,Yr10q,Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10d clashes with Yr10g,Yr10h,Yr10i,Yr10j,Yr10k,Yr10l,Yr10m,Yr10n,Yr10o,
    Yr10p,Yr10q,Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10e clashes with Yr10g,Yr10h,Yr10i,Yr10j,Yr10k,Yr10l,Yr10m,Yr10n,Yr10o,
    Yr10p,Yr10q,Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10f clashes with Yr10g,Yr10h,Yr10i,Yr10j,Yr10k,Yr10l,Yr10m,Yr10n,Yr10o,
    Yr10p,Yr10q,Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10g clashes with Yr10j,Yr10k,Yr10l,Yr10m,Yr10n,Yr10o,Yr10p,Yr10q,Yr10r,
    Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10h clashes with Yr10j,Yr10k,Yr10l,Yr10m,Yr10n,Yr10o,Yr10p,Yr10q,Yr10r,
    Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10i clashes with Yr10j,Yr10k,Yr10l,Yr10m,Yr10n,Yr10o,Yr10p,Yr10q,Yr10r,
    Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10j clashes with Yr10m,Yr10n,Yr10o,Yr10p,Yr10q,Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10k clashes with Yr10m,Yr10n,Yr10o,Yr10p,Yr10q,Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10l clashes with Yr10m,Yr10n,Yr10o,Yr10p,Yr10q,Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10m clashes with Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10n clashes with Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10o clashes with Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10p clashes with Yr10r,Yr10s,Yr10t,Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10q clashes with Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10r clashes with Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10s clashes with Yr10u,Yr10v,Yr10w,Yr10x
Class Yr10t clashes with Yr10u,Yr10v,Yr10w,Yr10x
Class Yr11l clashes with Yr11a,Yr11b,Yr11c,Yr11d,Yr11e,Yr11f,Yr11g,Yr11h,Yr11i,
    Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,Yr11o,Yr11p,Yr11q,Yr11r,
    Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr112 clashes with Yr11a,Yr11b,Yr11c,Yr11d,Yr11e,Yr11f,Yr11g,Yr11h,Yr11i,
    Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,Yr11o,Yr11p,Yr11q,Yr11r,
    Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr11a clashes with Yr11f,Yr11g,Yr11h,Yr11i,Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,
    Yr11o,Yr11p,Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr11b clashes with Yr11d,Yr11e,Yr11h,Yr11i,Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,
    Yr11o,Yr11p,Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr11c clashes with Yr11d,Yr11e,Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,Yr11o,Yr11p,
    Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr11d clashes with Yr11f,Yr11g,Yr11h,Yr11i,Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,
    Yr11o,Yr11p,Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr11e clashes with Yr11f,Yr11g,Yr11h,Yr11i,Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,
    Yr11o,Yr11p,Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr11f clashes with Yr11h,Yr11i,Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,Yr11o,Yr11p,
    Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr11g clashes with Yr11h,Yr11i,Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,Yr11o,Yr11p,
    Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr11h clashes with Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,Yr11o,Yr11p,Yr11q,Yr11r,
    Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z
Class Yr11i clashes with Yr11j,Yr11k,Yr11l,Yr11m,Yr11n,Yr11o,Yr11p,Yr11q,Yr11r,
    Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11j clashes with Yr11n,Yr11o,Yr11p,Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,
Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11k clashes with Yr11n,Yr11o,Yr11p,Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,
Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11l clashes with Yr11n,Yr11o,Yr11p,Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,
Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11m clashes with Yr11n,Yr11o,Yr11p,Yr11q,Yr11r,Yr11s,Yr11t,Yr11u,Yr11v,
Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11n clashes with Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11o clashes with Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11p clashes with Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11q clashes with Yr11s,Yr11t,Yr11u,Yr11v,Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11r clashes with Yr11v,Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11s clashes with Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11t clashes with Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11u clashes with Yr11w,Yr11x,Yr11y,Yr11z

Class Yr11v clashes with Yr11w,Yr11x,Yr11y,Yr11z

Class Yr12a clashes with Yr12c,Yr12d,Yr12e,Yr12f,Yr12g,Yr12h,Yr12i,Yr12j,Yr12k,
Yr12l,Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12b clashes with Yr12c,Yr12d,Yr12e,Yr12f,Yr12g,Yr12h,Yr12i,Yr12j,Yr12k,
Yr12l,Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12c clashes with Yr12e,Yr12f,Yr12g,Yr12h,Yr12i,Yr12j,Yr12k,Yr12l,Yr12m,
Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12d clashes with Yr12e,Yr12f,Yr12g,Yr12h,Yr12i,Yr12j,Yr12k,Yr12l,Yr12m,
Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12e clashes with Yr12h,Yr12i,Yr12j,Yr12k,Yr12l,Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12f clashes with Yr12h,Yr12i,Yr12j,Yr12k,Yr12l,Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12g clashes with Yr12h,Yr12i,Yr12j,Yr12k,Yr12l,Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12h clashes with Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12i clashes with Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12j clashes with Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12k clashes with Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12l clashes with Yr12m,Yr12n,Yr12o,Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12m clashes with Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12n clashes with Yr12p,Yr12q,Yr12r,Yr12s

Class Yr12o clashes with Yr12p,Yr12q,Yr12r,Yr12s

Importance of classclashes is low
Importance of teacherclashes is medium
Importance of roomclashes is medium
Importance of blocks is medium
Importance of preference is low

Cooling rate is .99 depth is deep

End of Timetable

Monday		Class	Subject	Teacher	Room
1		YR10Q	EMA	SC	GENRM
	->	YR10R	GER	DJ	GENRM
	->	YR10S	CSA	RZ	GENRM
	->	YR10T	ART	LM	AR
		YR11A	ENA	SJ	GENRM
		YR11D	CH	KR	GENRM
		YR11E	PE	AS	GYM
		YR12P	ECO	PT	GENRM
	->	YR12Q	PH	DM	SCIENCE
	->	YR12R	HEU	AR	GENRM
	->	YR12S	HDS	GC	GENRM
		YR7A	ENA	JH	GENRM
	->	YR7B	ENB	JG	GENRM
	->	YR7C	ENC	HL	GENRM
	->	YR7D	END	DC	GENRM
		YR8A	GEA	MB	GENRM
		YR8B	MAB	BH	GENRM
		YR8C	MAC	CI	GENRM
		YR9A	HIA	TH	GENRM
		YR9B	ENB	MD	GENRM
		YR9C	PEC	MM	GYM
2		YR10D	EMB	BH	GENRM
	->	YR10E	DR	DC	GENRM
	->	YR10F	GNR	GF	GENRM
		YR11J	MAB	SC	GENRM
	->	YR11K	LIT	DJ	GENRM
	->	YR11L	ECO	PT	GENRM
	->	YR11M	GRA	BM	GR
		YR12A	ENA	JG	GENRM
	->	YR12B	ENB	MD	GENRM
	->	YR7A	SCA	KR	SCIENCE
		YR7B	MU	LH	GENRM
		YR7C	HIC	SJ	GENRM
		YR7D	MAD	AG	GENRM
	->	YR8A	SCA	RZ	SCIENCE
		YR8B	HIB	TH	GENRM
		YR8C	MAC	CI	GENRM
		YR9D	GER	AR	GENRM
	->	YR9E	HOR	DM	SCIENCE
	->	YR9F	TEX	CR	NW
	->	YR9G	WW	AX	WW

Monday					
		Class	Subject	Teacher	Room
3		YR10A	ENA	JH	GENRM
	->	YR10B	CRB	JG	GR
		YR10C	ENC	DC	GENRM
		YR11S	CPR	JA	GENRM
	->	YR11T	TEX	CR	NW
	->	YR11U	PDE	GF	GENRM
	->	YR11V	PDE	AX	
		YR12H	MAB	BH	GENRM
	->	YR12I	ACC	NM	GENRM
	->	YR12J	ART	LM	AR
	->	YR12K	CC	SJ	GENRM
	->	YR12L	GEO	AC	GENRM
		YR7A	LAA	AR	GENRM
		YR7B	MAB	SC	GENRM
		YR7C	MAC	MB	GENRM
		YR7D	PED	MM	GENRM
		YR8A	MAA	KR	GENRM
	->	YR8B	SCB	CI	SCIENCE
	->	YR8C	SCC	RZ	SCIENCE
		YR9A	ENA	DJ	GENRM
		YR9B	ENB	MD	GENRM
		YR9C	TYC	EH	GENRM
4		YR10M	TYA	NM	GENRM
	->	YR10N	HLH	SH	GENRM
	->	YR10O	WW	AX	WW
	->	YR10P	PE	AS	GYM
		YR11S	CPR	JA	GENRM
	->	YR11T	TEX	CR	NW
	->	YR11U	PDE	GF	GENRM
	->	YR12E	BIO	AG	SCIENCE
	->	YR12F	SEC	EH	GENRM
	->	YR12G	LIT	DJ	GENRM
	->	YR7A	SCA	KR	SCIENCE
		YR7B	GEB	CA	GENRM
		YR7C	SSC	PT	GENRM
	->	YR7D	SCD	MG	SCIENCE
		YR8A	GEA	MB	GENRM
		YR8B	HIB	TH	GENRM
		YR8C	CSA	BH	GENRM
		YR9A	GEA	AC	GENRM
	->	YR9B	SCB	DM	SCIENCE
		YR9C	HIC	HL	GENRM

Monday					
		Class	Subject	Teacher	Room
5		YR10A	MAA	AC	GENRM
	->	YR10B	MAB	AG	GENRM
	->	YR10C	MAC	RZ	GENRM
		YR11W	MA2	BH	GENRM
	->	YR11X	ACC	NM	GENRM
	->	YR11Y	ART	LM	AR
	->	YR11Z	AG	JA	GENRM
		YR12C	MAA	SC	GENRM
	->	YR12D	HAU	SH	GENRM
		YR7A	MAA	MG	GENRM
	->	YR7B	SCB	KR	SCIENCE
		YR7C	PEC	AS	GENRM
		YR7D	GED	CA	GENRM
		YR8A	ENA	MD	GENRM
	->	YR8B	ENB	JH	GENRM
	->	YR8C	ENC	MJD	GENRM
	->	YR9H	WW	BM	WW
	->	YR9I	HEC	GC	DR
	->	YR9J	TEX	CR	NW
	->	YR9K	CER	AX	CE
6		YR10D	EMB	BH	GENRM
	->	YR10E	DR	DC	GENRM
	->	YR10F	GNR	GF	GENRM
	->	YR11N	PH	DM	SCIENCE
	->	YR11O	MCO	CI	GENRM
	->	YR11P	MAG	MG	GENRM
	->	YR11Q	MA1	AG	GENRM
		YR12C	MAA	SC	GENRM
	->	YR12D	HAU	SH	GENRM
	->	YR7E	ART	LM	AR
	->	YR7F	CER	AX	CE
	->	YR7G	TEX	GC	NW
	->	YR7H	WW	BM	WW
		YR8H	GE1	AR	GENRM
	->	YR8I	GE2	DJ	GENRM
	->	YR8J	HOR	JA	GENRM
	->	YR8K	MU	LH	GENRM
	->	YR8L	PSK	JH	GENRM
		YR9A	GEA	AC	GENRM
		YR9B	ENB	MD	GENRM
		YR9C	ENC	SJ	GENRM

Tuesday					
		Class	Subject	Teacher	Room
1		YR10J	PE	AS	GYM
	->	YR10K	HAS	SH	GENRM
	->	YR10L	TEX	GC	NW
		YR11J	MAB	SC	GENRM
	->	YR11K	LIT	DJ	GENRM
	->	YR11L	ECO	PT	GENRM
	->	YR11M	GRA	BM	GR
		YR12H	MAB	BH	GENRM
	->	YR12I	ACC	NM	GENRM
	->	YR12J	ART	LM	AR
	->	YR12K	CC	SJ	GENRM
	->	YR12L	GEO	AC	GENRM
		YR7A	LAA	AR	GENRM
		YR7B	PEB	MB	GENRM
	->	YR7C	SCC	MG	SCIENCE
		YR7D	CSA	DM	GENRM
		YR8A	ENA	MD	GENRM
	->	YR8B	ENB	JH	GENRM
	->	YR8C	ENC	MJD	GENRM
		YR9A	HIA	TH	GENRM
		YR9B	MAB	CI	GENRM
	->	YR9C	SCC	KR	SCIENCE
2		YR10J	PE	AS	GYM
	->	YR10K	HAS	SH	GENRM
	->	YR10L	TEX	GC	NW
	->	YR11H	BIO	RZ	SCIENCE
		YR11I	LS	PT	GENRM
	->	YR12M	CH	CI	SCIENCE
	->	YR12N	PE	MM	GENRM
	->	YR12O	LS	NM	GENRM
		YR7A	SSA	HL	GENRM
		YR7B	HIB	TH	GENRM
		YR7C	GEC	CA	GENRM
		YR7D	MAD	AG	GENRM
		YR8A	ENA	MD	GENRM
	->	YR8B	ENB	JH	GENRM
	->	YR8C	ENC	MJD	GENRM
		YR9A	ENA	DJ	GENRM
	->	YR9B	SCB	DM	SCIENCE
		YR9C	GEC	AC	GENRM

Tuesday					
		Class	Subject	Teacher	Room
3		YR10U	CSA	JA	GENRM
	->	YR10V	BKP	TS	GENRM
	->	YR10W	HEC	CR	DR
	->	YR10X	GRA	BM	GR
		YR11A	ENA	SJ	GENRM
	->	YR11D	CH	KR	SCIENCE
		YR11E	PE	MB	GENRM
		YR12A	ENA	JG	GENRM
	->	YR12B	ENB	MD	GENRM
		YR7A	MU	LH	GENRM
		YR7B	GEB	CA	GENRM
	->	YR7C	SCC	MG	SCIENCE
		YR7D	MAD	AG	GENRM
	->	YR8A	SCA	RZ	SCIENCE
		YR8B	MAB	BH	GENRM
		YR8C	MAC	CI	GENRM
		YR9A	ENA	DJ	GENRM
		YR9B	PEB	AS	GENRM
		YR9C	TYC	EH	GENRM
4		YR10A	MAA	AC	GENRM
	->	YR10B	MAB	AG	GENRM
	->	YR10C	MAC	RZ	GENRM
		YR11W	MA2	BH	GENRM
	->	YR11X	ACC	NM	GENRM
	->	YR11Y	ART	LM	AR
	->	YR11Z	AG	JA	GENRM
		YR12P	ECO	PT	GENRM
	->	YR12Q	PH	DM	SCIENCE
	->	YR12R	HEU	AR	GENRM
	->	YR12S	HDS	GC	GENRM
		YR7A	GEA	HL	GENRM
		YR7B	MAB	SC	GENRM
		YR7C	HIC	SJ	GENRM
	->	YR7D	SCD	MG	SCIENCE
		YR8A	MAA	KR	GENRM
		YR8B	GEB	MB	GENRM
		YR8C	HIC	TH	GENRM
		YR9A	PEA	AS	GYM
		YR9B	ENB	MD	GENRM
		YR9C	PEC	MM	GYM

Tuesday		Class	Subject	Teacher	Room
5		YR10G	TYB	NM	GENRM
	->	YR10H	GEL	AC	GENRM
	->	YR10I	ENW	MD	GENRM
		YR11C	ENC	DC	GENRM
	->	YR11H	BIO	RZ	SCIENCE
		YR11I	LS	PT	GENRM
	->	YR12E	BIO	AG	SCIENCE
	->	YR12F	SEC	EH	GENRM
	->	YR12G	LIT	DJ	GENRM
		YR7A	PEA	MM	GENRM
		YR7B	SSB	HL	GENRM
		YR7C	PEC	AS	GYM
		YR7D	GED	CA	GENRM
	->	YR8D	CER	AX	CE
	->	YR8E	WW	BM	WW
	->	YR8F	HEC	LM	DR
	->	YR8G	TEX	CR	NW
		YR9A	HIA	TH	GENRM
	->	YR9B	SCB	DM	SCIENCE
		YR9C	ENC	SJ	GENRM
6		YR10U	CSA	JA	GENRM
	->	YR10V	BKP	TS	GENRM
	->	YR10W	HEC	CR	DR
	->	YR10X	GRA	BM	GR
		YR11A	ENA	SJ	GENRM
	->	YR11D	CH	KR	SCIENCE
		YR11E	PE	AS	GYM
		YR12C	MAA	SC	GENRM
	->	YR12D	HAU	SH	GENRM
		YR7A	SSA	HL	GENRM
		YR7B	LAB	AR	GENRM
	->	YR7C	SCC	MG	SCIENCE
		YR7D	PED	MM	GYM
		YR8A	CSA	BH	GENRM
		YR8B	GEB	MB	GENRM
		YR8C	SSC	PT	GENRM
	->	YR9A	SCA	RZ	SCIENCE
		YR9B	MAB	CI	GENRM
		YR9C	GEC	AC	GENRM

Wednesday		Class	Subject	Teacher	Room
1		YR10A	ENA	JH	GENRM
		YR10B	ENB	HL	GENRM
		YR10C	ENC	DC	GENRM
		YR11J	MAB	SC	GENRM
	->	YR11K	LIT	DJ	GENRM
	->	YR11L	ECO	PT	GENRM
	->	YR11M	GRA	BM	GR
	->	YR12M	CH	CI	SCIENCE
	->	YR12N	PE	MM	GENRM
	->	YR12O	LS	NM	GENRM
		YR7A	HIA	SJ	GENRM
		YR7B	MU	LH	GENRM
		YR7C	MAC	MB	GENRM
		YR7D	MAD	AG	GENRM
		YR8A	MAA	KR	GENRM
		YR8B	MAB	BH	GENRM
	->	YR8C	SCC	RZ	SCIENCE
		YR9D	GER	AR	GENRM
	->	YR9E	HOR	DM	SCIENCE
	->	YR9F	TEX	CR	NW
	->	YR9G	WW	AX	WW
2		YR10Q	EMA	SC	GENRM
	->	YR10R	GER	DJ	GENRM
	->	YR10S	CSA	RZ	GENRM
	->	YR10T	ART	LM	AR
		YR11B	ENB	JH	GENRM
		YR11C	ENC	DC	GENRM
		YR11G	HI	TH	GENRM
		YR12A	ENA	JG	GENRM
	->	YR12B	ENB	MD	GENRM
		YR7A	GEA	HL	GENRM
	->	YR7B	SCB	KR	SCIENCE
		YR7C	MAC	MB	GENRM
		YR7D	CSA	DM	GENRM
	->	YR8D	CER	AX	CE
	->	YR8E	WW	BM	WW
	->	YR8F	HEC	GC	DR
	->	YR8G	TEX	CR	NW
		YR9A	TYA	EH	GENRM
		YR9B	MAB	CI	GENRM
		YR9C	ENC	SJ	GENRM

Wednesday					
		Class	Subject	Teacher	Room
3	->	YR10A	SCA	MG	SCIENCE
	->	YR10B	SCB	AG	SCIENCE
	->	YR10C	SCC	BH	SCIENCE
		YR11B	ENB	JH	GENRM
		YR11C	ENC	DC	GENRM
		YR11G	HI	TH	GENRM
		YR12A	ENA	JG	GENRM
	->	YR12B	ENB	MD	GENRM
	->	YR7E	ART	LM	AR
	->	YR7F	CER	AX	CE
	->	YR7G	TEX	GC	NW
	->	YR7H	WW	BM	WW
		YR8A	PEA	MM	GYM
	->	YR8B	PEB	AS	GYM
		YR8C	GEC	MB	GENRM
		YR9A	MAA	SC	GENRM
		YR9B	GEB	EH	GENRM
		YR9C	HIC	HL	GENRM
4		YR10A	ENA	JH	GENRM
		YR10B	ENB	HL	GENRM
	->	YR10C	CRC	JG	GR
		YR11C	ENC	DC	GENRM
		YR11H	BIO	RZ	GENRM
		YR11I	LS	PT	GENRM
		YR12H	MAB	BH	GENRM
	->	YR12I	ACC	NM	GENRM
	->	YR12J	ART	LM	AR
	->	YR12K	CC	SJ	GENRM
	->	YR12L	GEO	AC	GENRM
		YR7A	MAA	MG	GENRM
	->	YR7B	SCB	KR	SCIENCE
		YR7C	CSA	JA	GENRM
		YR7D	LAD	AR	GENRM
		YR8A	PEA	MM	GYM
	->	YR8B	PEB	AS	GYM
		YR8C	PEC	MB	GYM
	->	YR9H	WW	BM	WW
	->	YR9I	HEC	GC	DR
	->	YR9J	TEX	CR	NW
	->	YR9K	CER	AX	CE

Wednesday					
		Class	Subject	Teacher	Room
5		YR10U	CSA	JA	GENRM
	->	YR10V	BKP	TS	GENRM
	->	YR10W	HEC	CR	DR
	->	YR10X	GRA	BM	GR
	->	YR11N	PH	DM	SCIENCE
	->	YR11O	MCO	CI	GENRM
	->	YR11P	MAG	MG	GENRM
	->	YR11Q	MA1	AG	GENRM
		YR12H	MAB	BH	GENRM
	->	YR12I	ACC	NM	GENRM
	->	YR12J	ART	LM	AR
	->	YR12K	CC	SJ	GENRM
	->	YR12L	GEO	AC	GENRM
		YR7A	ENA	JH	GENRM
	->	YR7B	ENB	JG	GENRM
	->	YR7C	ENC	HL	GENRM
	->	YR7D	END	DC	GENRM
	->	YR8A	SCA	RZ	SCIENCE
		YR8B	SSB	PT	GENRM
		YR8C	HIC	TH	GENRM
		YR9A	MAA	SC	GENRM
		YR9B	PEB	AS	GYM
		YR9C	MAC	KR	GENRM
6	->	YR10A	CRA	JG	GR
		YR10B	ENB	HL	GENRM
		YR10C	ENC	DC	GENRM
	->	YR11N	PH	DM	SCIENCE
	->	YR11O	MCO	CI	GENRM
	->	YR11P	MAG	MG	GENRM
	->	YR11Q	MA1	AG	GENRM
		YR11R	LAN	AR	GENRM
		YR12H	MAB	BH	GENRM
	->	YR12I	ACC	NM	GENRM
	->	YR12J	ART	LM	AR
	->	YR12K	CC	SJ	GENRM
	->	YR12L	GEO	AC	GENRM
	->	YR7A	SCA	KR	SCIENCE
		YR7B	MAB	SC	GENRM
		YR7C	PEC	AS	GYM
		YR7D	HID	TH	GENRM
		YR8A	ENA	MD	GENRM
	->	YR8B	ENB	JH	GENRM
	->	YR8C	ENC	MJD	GENRM
	->	YR9H	WW	BM	WW
	->	YR9I	HEC	GC	DR
	->	YR9J	TEX	CR	NW
	->	YR9K	CER	AX	CE

Thursday					
		Class	Subject	Teacher	Room
1	->	YR10A	SCA	MG	SCIENCE
	->	YR10B	SCB	AG	SCIENCE
	->	YR10C	SCC	BH	SCIENCE
		YR11C	ENC	DC	GENRM
		YR11H	BIO	RZ	GENRM
		YR11I	LS	PT	GENRM
	->	YR12M	CH	CI	SCIENCE
	->	YR12N	PE	MM	GENRM
	->	YR12O	LS	NM	GENRM
		YR7A	MU	LH	GENRM
		YR7B	LAB	AR	GENRM
		YR7C	MAC	MB	GENRM
		YR7D	SSD	HL	GENRM
	->	YR8D	CER	AX	CE
	->	YR8E	WW	BM	WW
	->	YR8F	HEC	LM	DR
	->	YR8G	TEX	CR	NW
		YR9A	PEA	AS	GYM
		YR9B	TYB	EH	GENRM
		YR9C	ENC	SJ	GENRM
2		YR10M	TYA	NM	GENRM
	->	YR10N	HLH	SH	GENRM
	->	YR10O	WW	AX	WW
	->	YR10P	PE	AS	GYM
		YR11A	ENA	SJ	GENRM
	->	YR11D	CH	KR	SCIENCE
		YR11E	PE	MB	GENRM
		YR12P	ECO	PT	GENRM
	->	YR12Q	PH	DM	SCIENCE
	->	YR12R	HEU	AR	GENRM
	->	YR12S	HDS	GC	GENRM
		YR7A	ENA	JH	GENRM
	->	YR7B	ENB	JG	GENRM
	->	YR7C	ENC	HL	GENRM
	->	YR7D	END	DC	GENRM
		YR8A	PEA	MM	GENRM
		YR8B	CSA	MG	GENRM
	->	YR8C	SCC	RZ	SCIENCE
		YR9A	MAA	SC	GENRM
		YR9B	ENB	MD	GENRM
		YR9C	GEC	AC	GENRM

Thursday					
		Class	Subject	Teacher	Room
3		YR10A	MAA	AC	GENRM
	->	YR10B	MAB	AG	GENRM
	->	YR10C	MAC	RZ	GENRM
		YR11W	MA2	BH	GENRM
	->	YR11X	ACC	NM	GENRM
	->	YR11Y	ART	LM	AR
	->	YR11Z	AG	JA	GENRM
		YR12P	ECO	PT	GENRM
	->	YR12Q	PH	DM	SCIENCE
	->	YR12R	HEU	AR	GENRM
	->	YR12S	HDS	GC	GENRM
		YR7A	ENA	JH	GENRM
	->	YR7B	ENB	JG	GENRM
	->	YR7C	ENC	HL	GENRM
	->	YR7D	END	DC	GENRM
		YR8A	MAA	KR	GENRM
	->	YR8B	SCB	CI	SCIENCE
		YR8C	PEC	MB	GYM
		YR9A	MAA	SC	GENRM
		YR9B	PEB	AS	GYM
		YR9C	TYC	EH	GENRM
4		YR10G	TYB	NM	GENRM
	->	YR10H	GEL	AC	GENRM
	->	YR10I	ENW	MD	GENRM
		YR11S	CPR	JA	GENRM
	->	YR11T	TEX	CR	NW
	->	YR11U	PDE	GF	GENRM
		YR12P	ECO	PT	GENRM
	->	YR12Q	PH	DM	SCIENCE
	->	YR12R	HEU	AR	GENRM
	->	YR12S	HDS	GC	GENRM
		YR7A	ENA	JH	GENRM
	->	YR7B	ENB	JG	GENRM
	->	YR7C	ENC	HL	GENRM
	->	YR7D	END	DC	GENRM
		YR8A	HIA	TH	GENRM
		YR8B	MAB	BH	GENRM
		YR8C	PEC	MB	GENRM
		YR9A	ENA	DJ	GENRM
		YR9B	GEB	EH	GENRM
	->	YR9C	SCC	KR	SCIENCE

Thursday					
		Class	Subject	Teacher	Room
5		YR10Q	EMA	SC	GENRM
	->	YR10R	GER	DJ	GENRM
	->	YR10S	CSA	RZ	GENRM
	->	YR10T	ART	LM	AR
		YR11I	PSA	MB	GENRM
	->	YR11J	PSB	MJD	GENRM
		YR12A	ENA	JG	GENRM
	->	YR12B	ENB	MD	GENRM
		YR7A	HIA	SJ	GENRM
		YR7B	SSB	HL	GENRM
		YR7C	SSC	PT	GENRM
	->	YR7D	SCD	MG	SCIENCE
	->	YR8D	CER	AX	CE
	->	YR8E	WW	BM	WW
	->	YR8F	HEC	GC	DR
	->	YR8G	TEX	CR	NW
		YR9A	TYA	EH	GENRM
		YR9B	MAB	CI	GENRM
		YR9C	PEC	MM	GENRM
6		YR10A	ENA	JH	GENRM
		YR10B	ENB	HL	GENRM
		YR10C	ENC	DC	GENRM
	->	YR11N	PH	DM	SCIENCE
	->	YR11O	MCO	CI	GENRM
	->	YR11P	MAG	MG	GENRM
	->	YR11Q	MA1	AG	GENRM
		YR11R	LAN	AR	GENRM
		YR12C	MAA	SC	GENRM
	->	YR12D	HAU	SH	GENRM
	->	YR7E	ART	LM	AR
	->	YR7F	CER	AX	CE
	->	YR7G	TEX	CR	NW
	->	YR7H	WW	BM	WW
		YR8A	HIA	TH	GENRM
		YR8B	SSB	PT	GENRM
		YR8C	GEC	MB	GENRM
		YR9A	ENA	DJ	GENRM
		YR9B	GEB	EH	GENRM
	->	YR9C	SCC	KR	SCIENCE

Friday		Class	Subject	Teacher	Room
1		YR10G	TYB	NM	GENRM
	->	YR10H	GEL	AC	GENRM
	->	YR10I	ENW	MD	GENRM
		YR11S	CPR	JA	GENRM
	->	YR11T	TEX	CR	NW
	->	YR11U	PDE	GF	GENRM
	->	YR11V	PDE	AX	
	->	YR12E	BIO	AG	SCIENCE
	->	YR12F	SEC	EH	GENRM
	->	YR12G	LIT	DJ	GENRM
		YR7A	PEA	MM	GYM
	->	YR7B	PEB	MB	GYM
		YR7C	LAC	AR	GENRM
		YR7D	HID	TH	GENRM
		YR8A	SSA	PT	GENRM
	->	YR8B	SCB	CI	SCIENCE
	->	YR8C	SCC	RZ	SCIENCE
		YR9A	PEA	AS	GENRM
		YR9B	HIB	DC	GENRM
		YR9C	ENC	SJ	GENRM
2		YR10M	TYA	NM	GENRM
	->	YR10N	HLH	SH	GENRM
	->	YR10O	WW	AX	WW
	->	YR10P	PE	AS	GENRM
		YR11A	ENA	SJ	GENRM
		YR11B	ENB	JH	GENRM
	->	YR12E	BIO	AG	SCIENCE
	->	YR12F	SEC	EH	GENRM
	->	YR12G	LIT	DJ	GENRM
		YR7A	PEA	MM	GYM
	->	YR7B	PEB	MB	GYM
		YR7C	LAC	AR	GENRM
		YR7D	SSD	HL	GENRM
	->	YR8A	SCA	RZ	SCIENCE
	->	YR8B	SCB	CI	SCIENCE
		YR8C	SSC	PT	GENRM
		YR9A	GEA	AC	GENRM
		YR9B	HIB	DC	GENRM
		YR9C	MAC	KR	GENRM

Friday					
		Class	Subject	Teacher	Room
3	->	YR10A	SCA	MG	SCIENCE
	->	YR10B	SCB	AG	SCIENCE
	->	YR10C	SCC	BH	SCIENCE
		YR11B	ENB	JH	GENRM
		YR11G	HI	TH	GENRM
		YR12C	MAA	SC	GENRM
	->	YR12D	HAU	SH	GENRM
	->	YR7E	ART	LM	AR
	->	YR7F	CER	AX	CE
	->	YR7G	TEX	GC	NW
	->	YR7H	WW	BM	WW
		YR8H	GE1	DJ	GENRM
	->	YR8I	GE2	AR	GENRM
	->	YR8J	HOR	JA	GENRM
	->	YR8K	MU	LH	GENRM
	->	YR8L	PSK	MM	GENRM
		YR9A	TYA	EH	GENRM
		YR9B	HIB	DC	GENRM
		YR9C	MAC	KR	GENRM
4		YR10D	EMB	BH	GENRM
	->	YR10E	DR	DC	GENRM
	->	YR10F	GNR	GF	GENRM
		YR11B	ENB	JH	GENRM
		YR11G	HI	TH	GENRM
	->	YR12M	CH	CI	SCIENCE
	->	YR12N	PE	MM	GENRM
	->	YR12O	LS	NM	GENRM
	->	YR7E	ART	LM	AR
	->	YR7F	CER	AX	CE
	->	YR7G	TEX	GC	NW
	->	YR7H	WW	BM	WW
		YR8H	GE1	AR	GENRM
	->	YR8I	GE2	DJ	GENRM
	->	YR8J	HOR	JA	GENRM
	->	YR8K	MU	LH	GENRM
	->	YR8L	PSK	AG	GENRM
	->	YR9A	SCA	RZ	SCIENCE
		YR9B	TYB	EH	GENRM
		YR9C	HIC	HL	GENRM

Friday		Class	Subject	Teacher	Room
5		YR10A	ENA	JH	GENRM
		YR10B	ENB	HL	GENRM
		YR10C	ENC	DC	GENRM
		YR11W	MA2	BH	GENRM
	->	YR11X	ACC	NM	GENRM
	->	YR11Y	ART	LM	AR
	->	YR11Z	AG	JA	GENRM
	->	YR12E	BIO	AG	SCIENCE
	->	YR12F	SEC	EH	GENRM
	->	YR12G	LIT	DJ	GENRM
		YR7A	MAA	MG	GENRM
		YR7B	MAB	SC	GENRM
		YR7C	GEC	CA	GENRM
		YR7D	PED	MM	GYM
		YR8A	SSA	PT	GENRM
		YR8B	PEB	AS	GENRM
		YR8C	MAC	CI	GENRM
		YR9D	GER	AR	GENRM
	->	YR9E	HOR	DM	SCIENCE
	->	YR9F	TEX	CR	NW
	->	YR9G	WW	AX	WW
6		YR10J	PE	AS	GENRM
	->	YR10K	HAS	SH	GENRM
	->	YR10L	TEX	GC	NW
		YR11J	MAB	SC	GENRM
	->	YR11K	LIT	DJ	GENRM
	->	YR11L	ECO	PT	GENRM
	->	YR11M	GRA	BM	GR
	->	YR12M	CH	CI	SCIENCE
	->	YR12N	PE	MM	GENRM
	->	YR12O	LS	NM	GENRM
		YR7A	MAA	MG	GENRM
		YR7B	HIB	TH	GENRM
		YR7C	CSC	JA	GENRM
		YR7D	LAD	AR	GENRM
		YR8A	ENA	MD	GENRM
	->	YR8B	ENB	JH	GENRM
	->	YR8C	ENC	MJD	GENRM
	->	YR9A	SCA	RZ	SCIENCE
		YR9B	TYB	EH	GENRM
		YR9C	MAC	KR	GENRM

7. CONCLUSION

This report has described a language for specifying and printing timetables. The language allows easy specification and modification of requirements. Once the data has been entered and compiled, the scheduler can be executed. The compiler is then used to print timetable output.

Further work is required to enhance to expression of complex constraints. For example, it is often desirable to specify that a requirement should be placed in close proximity to another requirement. This information requires arbitrary linking of requirements with weights, and is difficult to express.

ACKNOWLEDGEMENTS

REFERENCES

[1]   D. Abramson, "Using simulated annealing to solve school timetables: Serial and Parallel Algorithms", Department of Communications Engineering report TR-112-069R, Royal Melbourne Institute of Technology, Melbourne, Australia, 1988.