



Timetable Database Restructuring

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Supervisor: Stephen Houston

- Introduction
- Syllabus Program
- Project aims
- Development
- Conclusions
- Suggested future work

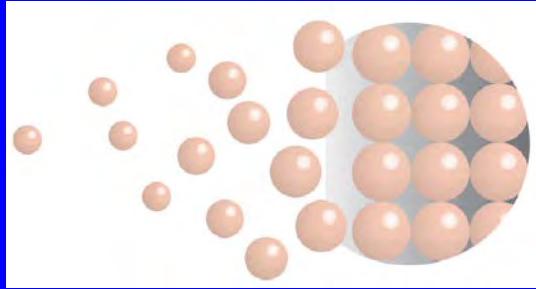
- *Introduction*
- Syllabus Plus program
- Project aims
- Development
- Conclusions
- Suggested future work

Introduction

- Timetable data will need to be converted into a new teaching pattern
- This project has two functions, both with practical and relevant applications to the timetabling of the university
- The timetable database will need to be amended to reflect the changes in the academic year

- Introduction
- *Syllabus Program*
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Syllabus Plus



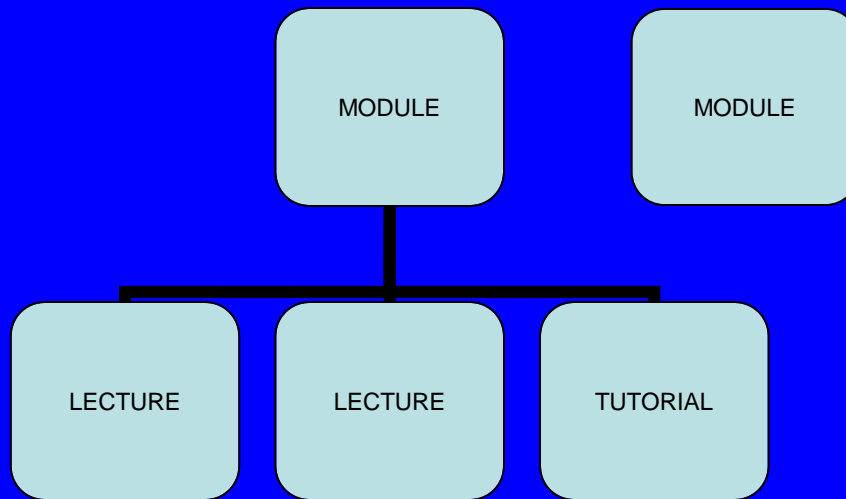
Syllabus Plus (Heriot-Watt University)

SYLLABUS PLUS

- The university uses a software package called Syllabus Plus for its timetabling
- Syllabus plus has the ability to schedule taught activities based on student registration and room and staff requirements
- The software is used as a repository for room booking information

Syllabus Plus

Programme of Study



Selection of modules


Each module has a number of activities associated with it

Syllabus Plus

Course Planner at Heriot Watt University - final.img

File Edit View Scheduling Timetabler Windows Help

Institution

ID	User Text	Labels	Availability	Usage	Starts	Timetable
Name	Host Key	Department				
Heriot-Watt University 2006/7	HWTT2007	(none)				
Description Heriot-Watt University Timetable 2006/2007 (HWTT2007)						
Dataset		Default Activity Factor				
		1				
Activities: 8756	Activity Groups: 1		Activity Groups: 1			
Scheduled: 7931	Unscheduled: 825		Unscheduled: 825			
Activity Templates: 47	Activity Template Groups: 0		Activity Template Groups: 0			
Constraint Profiles: 0	Constraint Profile Groups: 0		Constraint Profile Groups: 0			
Departments: 60	Department Groups: 0		Department Groups: 0			
Equipment: 0	Equipment Groups: 0		Equipment Groups: 0			
Locations: 190	Location Groups: 8		Location Groups: 8			
Modules: 2066	Module Groups: 2		Module Groups: 2			
Pooled Resources: 0	Pooled Resource Groups: 0		Pooled Resource Groups: 0			
Posts: 0	Post Groups: 0		Post Groups: 0			
Programmes of Study: 628	Programme of Study Groups: 0		Programme of Study Groups: 0			
Staff: 277	Staff Groups: 1		Staff Groups: 1			
Students: 1	Student Groups: 0		Student Groups: 0			
Student Sets: 122	Student Set Groups: 0		Student Set Groups: 0			
Suitabilities: 20	Suitability Groups: 0		Suitability Groups: 0			
Time Blocks: 0	Time Block Groups: 0		Time Block Groups: 0			
Zones: 0	Zone Groups: 0		Zone Groups: 0			
Problems: 530						
Completed 						

Problems

Summary Problems

Constraint Type	Problem Count
Activity/Location Size	0
Avoid Deferred Resourcing Constraint	0
Avoid Double Booking Constraint	422
Avoid Resource Mismatch Constraint	39
Avoid Sequencing Constraint	0
Avoid concurrency	0
Free Block	0
Maximum Hours	0
Maximum Work Span	0
Maximum time per week	0
Non-Contact Time Constraint	0
Resource Break	0
Same Time Activities Constraint	0
Share with Department	17
Total	530

530 Modify Refresh New

- Introduction
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- Ability to change population number of modules and activities
- Delete term 3 modules and activities
- Ability to change module and activity name
- Change the teaching week pattern from term to semester

To do these changes in the program I need:

- To top up dates of file in Access Table (Module, Activity)
- Two programs to change the population number.
- One program to change module and activity name, at the same time to change module term week.
- One program to change activity term week.

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- *Development*
 - *Add dates file to Access Tables*
 - Change population number
 - Delete term 3
 - Change module and activity name.
 - Change pattern week

Development Fields

Module table:

hostkey	Title(name)	Description	nDepartment	Term
---------	-------------	-------------	-------------	------

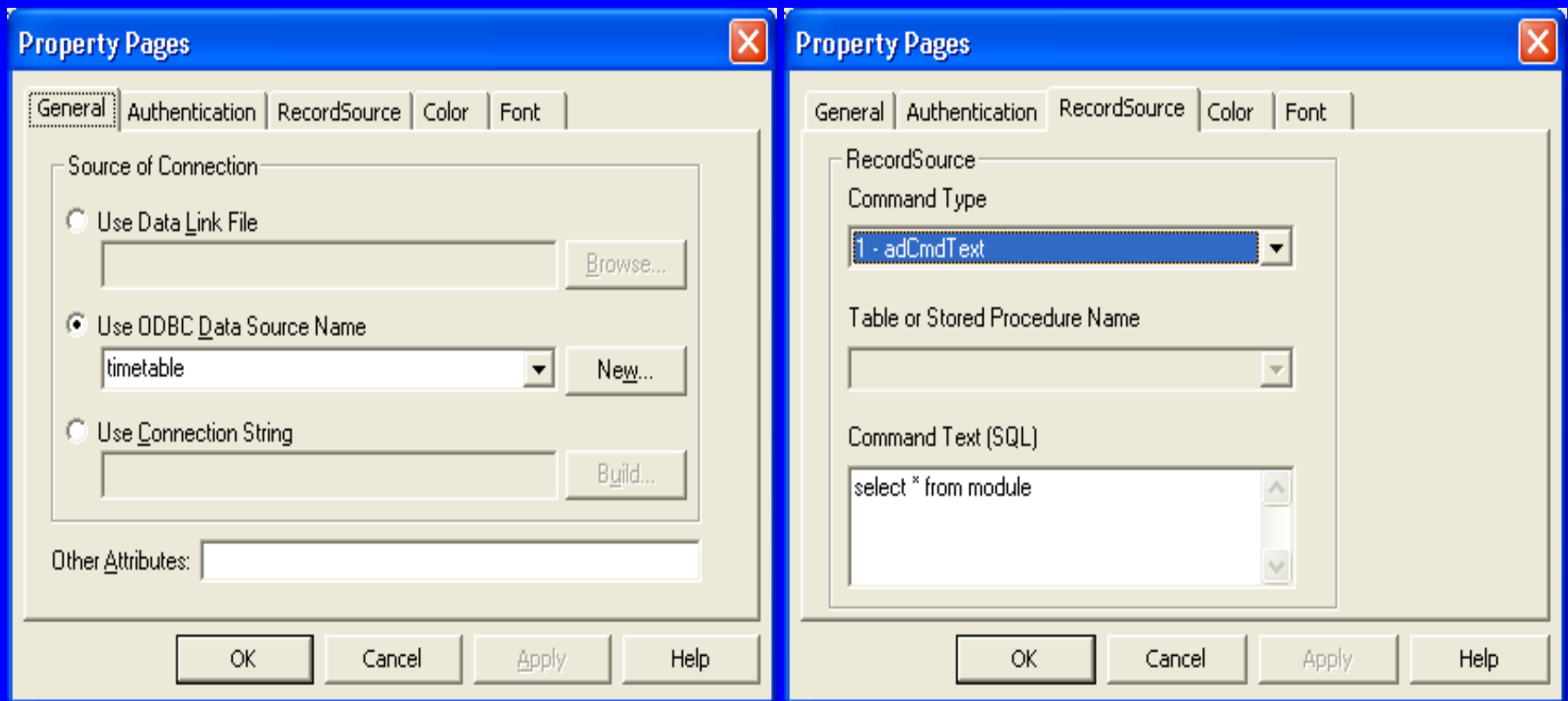
Activity table:

hostkey	Title(name)	Description	nDepartment	nModule	Activity Type
---------	-------------	-------------	-------------	---------	---------------

Development

Add dates file to Access Tables

Adoc1

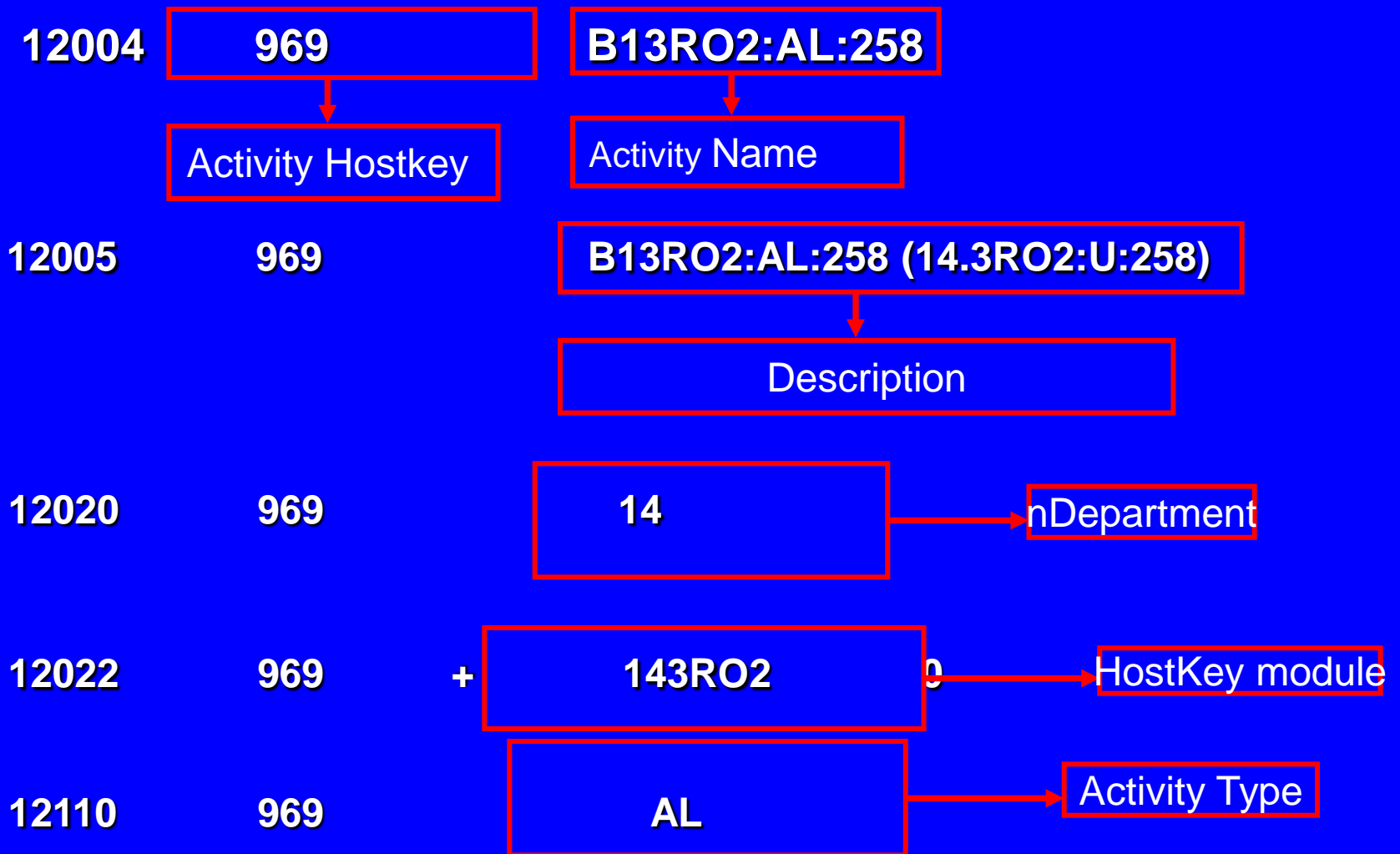


Development

REM Activity: B13RO2:AL:258

12004	969	B13RO2:AL:258			
12005	969	B13RO2:AL:258 (14.3RO2:U:258)			
12020	969	14			
12036	969	0			
12021	969	0			
12022	969	+	143RO2	0	HostKey module
12028	969	1			
12031	969	-all			
12031	969	+	#SPLUS0CC89E		
12032	969	-all			
12035	969				
12039	969	0			
12051	969	1			
12051	969	0			
12060	969	60			
12061	969	98	159		
12062	969	9			
12063	969	000000000000001111111100000000000000000000000000000000			
12081	969	-all	00	0	0
12081	969	+	1111111111111000000000111111111111111111111111111111110	0	1095
12081	969	+	1111111111111000000000111111111111111111111111111111111	0	1095
12081	969	+	1111111111111000000000111111111111111111111111111111112	0	1095
12081	969	+	1111111111111000000000111111111111111111111111111111113	0	1095
12081	969	+	1111111111111000000000111111111111111111111111111111114	0	1095
12100	969	2			
12101	969	4	975		
12102	969	102	975		
12106	969	-all			
12106	969	+	14	4	975
12106	969	+	15	4	975
12106	969	+	16	4	975
12106	969	+	17	4	975
12110	969	AL			

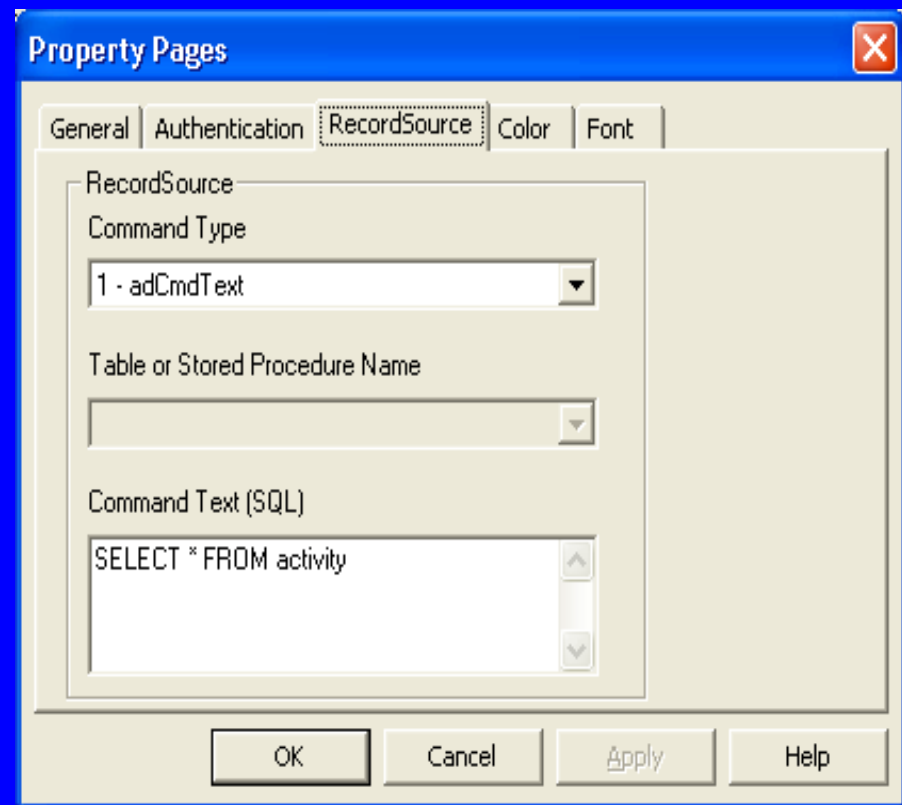
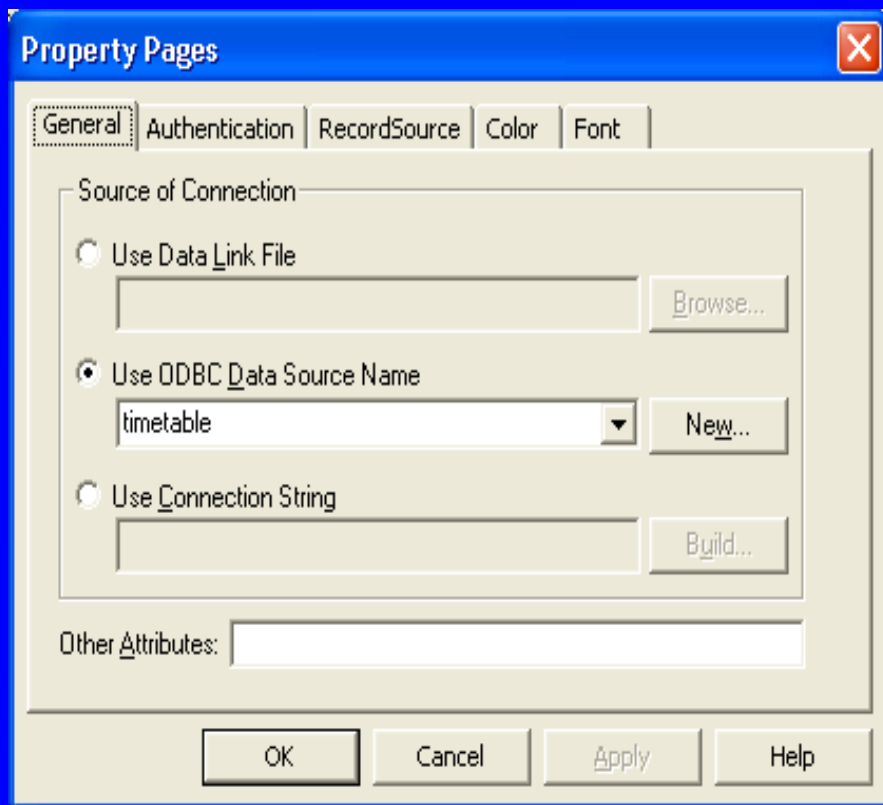
Development



Development

Add dates file to Access Tables

Adodc1



Development

Microsoft Access

File Edit View Insert Format Records Tools Window Help

Type a question for help

activity : Table

HostKey	Title	nModule	nDepartment	Description	ActivityTypes
#SPLUS000A1E	F72SD1:T:127	F72SD1	17	F74SQ1:AL:146 (17.4SQ1:CL:146)	T
#SPLUS000A20	F74AM1:LC:132	174AM1	17		LC
#SPLUS005B4E	C.SML:wk37:341.9	#SPLUS33F54F	39	SML Internal Honours Module Exam Boards (graduating studen	#SPLUSADDAI
#SPLUS005B50	C.SML:wk37:346.3	#SPLUS33F54F	39	A&F Module Exam Board (graduating students): booked at req	#SPLUSADDAI
#SPLUS005B54	C.SML:wk38:351.5	#SPLUS33F54F	39	SML Honours Progression Exam Boards (graduating students):	#SPLUSADDAI
#SPLUS005B5C	C.SML:wk40:335.5-E	#SPLUS33F54F	39	SML Progression Exam Boards (non-graduating students): boo	#SPLUSADDAI
#SPLUS005B5E	C.SML:wk49:336.3-E	#SPLUS33F54F	39	Economics Progression Exam Board: booked at request of Mr	#SPLUSADDAI
#SPLUS005B60	C.SML:wk49:342.3-E	#SPLUS33F54F	39	A&F Progression Exam Board: booked at request of Mr Campb	#SPLUSADDAI
#SPLUS005B62	C.SML:wk49:352.3-E	#SPLUS33F54F	39	Management Progression Exam Board: booked at request of M	#SPLUSADDAI
#SPLUS00717C	SBE Th wk11 2hrs - C	#SPLUS31B613	#SPLUS6F66F	Invitation to Tender - UK trade & Investment Meeting	#SPLUSADDAI
#SPLUS008539	comp:srb:155:Wk3	#SPLUS2519F1	#SPLUS14760	bb16 Group project	#SPLUSADDAI
#SPLUS008597	SBE T wk12 6hrs - P	#SPLUS31B613	#SPLUS6F66F	Research Meeting	#SPLUSADDAI
#SPLUS00887F	C1MSC3:AL:311	C1MSC3	39	MSc in Logistics: booked at request of Mrs Gillian Townsend (x	AL
#SPLUS008881	C1MSC3:AL:352	C1MSC3	39	MSc in Logistics: booked at request of Mrs Gillian Townsend (x	AL
#SPLUS008883	C1MSC3:AL:351	C1MSC3	39	MSc in Logistics: booked at request of Mrs Gillian Townsend (x	AL
#SPLUS008885	C1MSC3:AL:321	C1MSC3	39	MSc in Logistics: booked at request of Mrs Gillian Townsend (x	AL
#SPLUS008887	C1MSC3:AL:341	C1MSC3	39	MSc in Logistics: booked at request of Mrs Gillian Townsend (x	AL
#SPLUS008889	C1MSC3:AL:313	C1MSC3	39	MSc in Logistics: booked at request of Mrs Gillian Townsend (x	AL
#SPLUS00888B	C1MSC3:AL:343	C1MSC3	39	MSc in Logistics: booked at request of Mrs Gillian Townsend (x	AL
#SPLUS00888D	C1MSC3:AL:317	C1MSC3	39	MSc in Logistics: booked at request of Mrs Gillian Townsend (x	AL
#SPLUS00888F	C21PA3:T:315	321PA3	39		T
#SPLUS008891	C14DN3:AL:354	C14DN3	39		AL
#SPLUS008895	C21PA3:T:325	321PA3	39		T
#SPLUS008897	C21PA3:T:335	321PA3	39		T
#SPLUS008899	C21PA3:T:345	321PA3	39		T
#SPLUS00889B	C21PA3:T:355	321PA3	39		T
#SPLUS00889D	C21PA3:T:321	321PA3	39		T

Record: 1 of 8763

Datasheet View

NUM

Development

```
Open "D:\pat\ timetable\final_uf_free_availability.uef" For Input As #1
```

```
Adodc1.Refresh
```

```
Do Until EOF(1)
```

```
Line Input #1, VarTexto
```

```
i = nCharactersUntilEmpty(VarTexto, 1)
```

```
miLinia = Mid(VarTexto, 1, i) 'Take Id
```

```
VarTexto = Mid(VarTexto, i + 1, Len(VarTexto)) 'delete Id
```

```
Select Case miLinia
```

```
Case "11004"
```

```
Adodc1.Recordset.AddNew
```

```
Adodc1.Recordset!hostKey = Mid(VarTexto, 2, nCharactersUntilEmpty(VarTexto, i) - 1)
```

```
j = nCharactersUntilEmpty(VarTexto, 2)
```

```
Adodc1.Recordset!title = Mid(VarTexto, j + 2, Len(VarTexto))
```

```
Case "11005"
```

```
j = nCharactersUntilEmpty(VarTexto, 2)
```

```
Adodc1.Recordset!Description = Mid(VarTexto, j + 1, Len(VarTexto))
```

```
Case "11020"
```

```
j = nCharactersUntilEmpty(VarTexto, 2)
```

```
Adodc1.Recordset!nDepartment = Mid(VarTexto, j + 2, Len(VarTexto))
```

```
Case "11063"
```

```
j = nCharactersUntilEmpty(VarTexto, 2)
```

```
Adodc1.Recordset!Term_11063 = Mid(VarTexto, j + 2, Len(VarTexto))
```

```
Adodc1.Recordset.Update
```

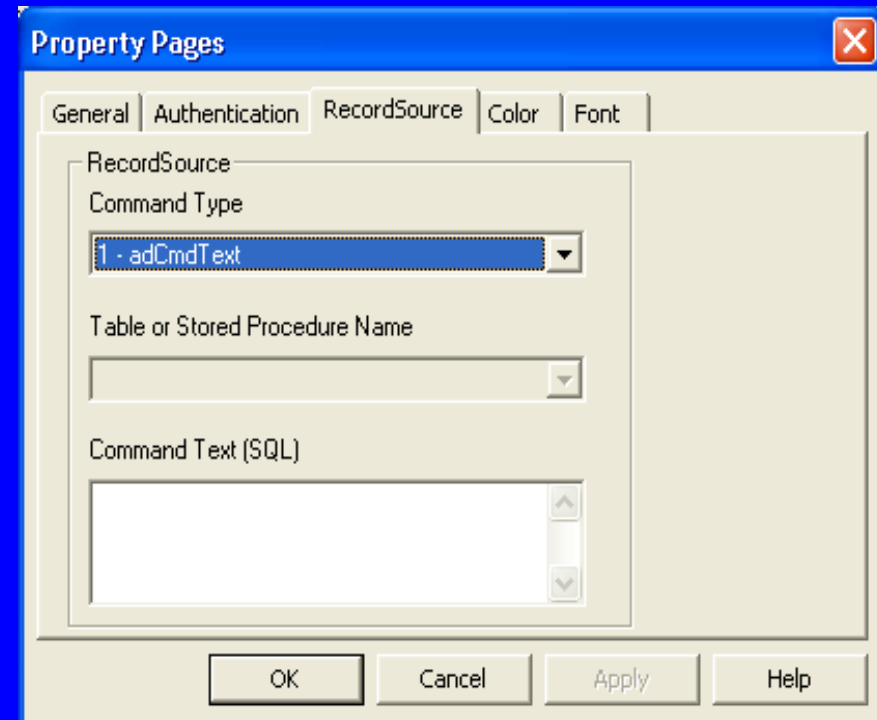
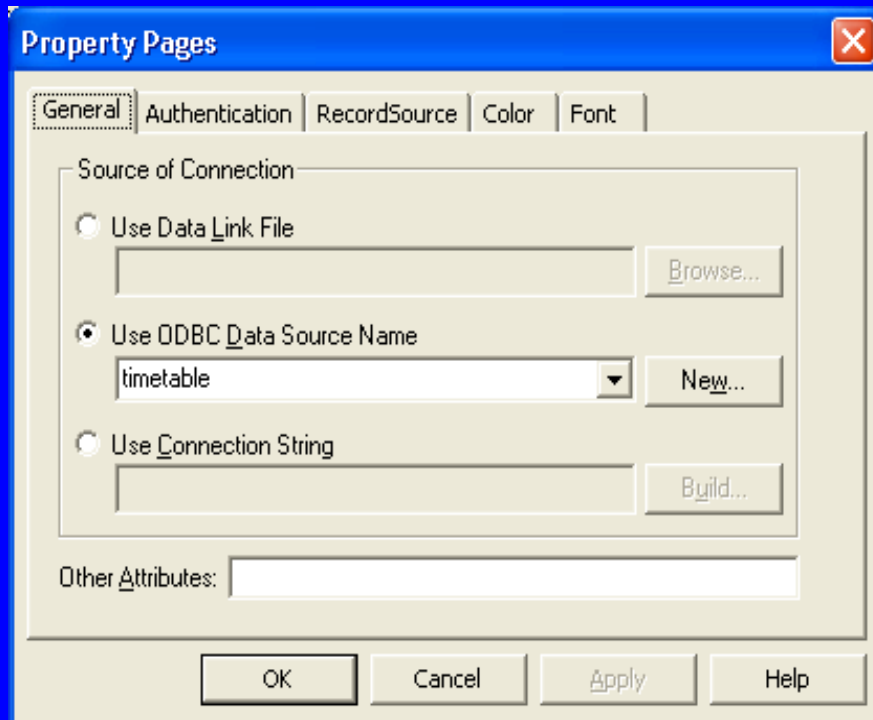
- *Development*
 - Add dates file to Access Tables
 - *Change population number*
 - Delete term 3
 - Change module and activity name
 - Change pattern week

Change population number

Module Name	Number Population
B31CI3	3
B31DI2	109
B31EI3	128
B31EN1	105
B31MY2	14
B31PX1	55
B31PY2	146

Development

Adodc 2



Development

```
Open "D:\pat\timetable\add_population_activities.txt" For Input As #1
Open "D:\pat\timetable\add_population_modules.txt" For Output As #2
```

```
Adodc2.RecordSource = "select Title from module"
Do Until EOF(1)
```

```
Line Input #1, VarTexto
```

```
Adodc2.Refresh
Adodc2.Recordset.MoveFirst
Do Until Adodc2.Recordset.EOF
    If Line = "REM Module: " + Adodc2.Recordset!title Then
        Module = Adodc2.Recordset!title
        Select Case Module
            Case "B31CI3" '3
                Print #2, VarTexto
                VarTexto = number_population_module(3)
                Line Input #1, VarTexto
                .....
```

Development

Function number_population_module(number As Integer)

Line Input #1, VarText0

```
i = nCharactersUntilEmpty(VarText0, 1)
Line = Mid(VarText0, 1, i) 'Take Id
```

```
While Line <> "11021"
```

```
Print #2, VarText0
```

```
Line Input #1, VarText0
```

```
i = nCharactersUntilEmpty(VarText0, 1)
```

```
Line = Mid(VarText0, 1, i) 'Take Id
```

```
myLine = Mid(VarText0, i + 1, Len(VarText0)) 'delete Id
```

```
j = nCharactersUntilEmpty(myLine, 2)
```

```
Wend
```

```
Text = Line & Mid(myLine, 1, j) & Chr(9) & number
```

```
Print #2, Text
```

```
Line Input #1, VarText0
```

```
While Line <> "11039"
```

```
Print #2, VarText0
```

```
Line Input #1, VarText0
```

```
i = nCharactersUntilEmpty(VarText0, 1)
```

```
Line = Mid(VarText0, 1, i) 'Take Id
```

```
myLine = Mid(VarText0, i + 1, Len(VarText0)) 'delete Id
```

```
j = nCharactersUntilEmpty(myLine, 2)
```

```
Wend
```

```
Text = Line & Mid(myLine, 1, j) & Chr(9) & number
```

```
Print #2, Text
```

End Function

Development

REM Module: B31CI3

```
11004      221CI3      B31CI3
11005      221CI3      Engineering Design
11020      221CI3      #SPLUS147609
11036      221CI3      0
11021     221CI3      3
11027      221CI3      -all                0
11027      221CI3      -all                1
11030      221CI3      -all
11039     221CI3      3
11051      221CI3      1
11051      221CI3      0
11061      221CI3      196                264
11063      221CI3      00000000000000000000000011111111110000000000000
11081      221CI3      -all                00000000000000000000000000000000000000000000000000000000 0
0
11081      221CI3      +                11111111111111111111111111111111111111111111000000000011111111111111 0
1095
11081      221CI3      +                11111111111111111111111111111111111111111111100000000001111111111111 0
1095
11081      221CI3      +                11111111111111111111111111111111111111111111110000000000111111111111 0
1095
11081      221CI3      +                11111111111111111111111111111111111111111111111000000000111111111111 0
1095
11081      221CI3      +                11111111111111111111111111111111111111111111111100000000011111111111 0
1095
11331      221CI3      -all
11331      221CI3      +
11332      221CI3
11333      221CI3
11334      221CI3
11335      221CI3
REM
```

Development

Change number population Activity

```
Adodc2.RecordSource="select hostKey, Title from module where Title= 'B31C13' or Title=  
'B31D12' OR Title= 'B31E13'...
```

```
sql1 = "select Title, ActivityTypes, nModule from activity where nModule = ""  
Adodc3.RecordSource = sql1
```

```
Do Until Adodc2.Recordset.EOF
```

```
    hostKey = Adodc2.Recordset!hostKey
```

```
    If count = 1 Then
```

```
        sql1 = sql1 + "" & hostKey & ""
```

```
    Else
```

```
        sql1 = sql1 + "OR " + "nModule = "" & hostKey & ""
```

```
    End If
```

```
    count = count + 1
```

```
Adodc2.Recordset.MoveNext
```

```
Loop 'ado2
```

Development

Change number population Activity

```
Do Until Adodc3.Recordset.EOF
```

```
If Line = "REM Activity: " + Adodc3.Recordset!title Then  
  If Adodc3.Recordset!ActivityTypes = "AL" Then
```

```
    Adodc2.Refresh
```

```
    Adodc2.Recordset.MoveFirst
```

```
    Do Until Adodc2.Recordset.EOF
```

```
      If Adodc2.Recordset!hostKey = Adodc3.Recordset!nModule Then  
        Module = Adodc2.Recordset!title
```

```
      Select Case Module
```

```
        Case "B31PX1" '55
```

```
          Print #2, VarTexto
```

```
          VarTexto = number_population_activity(55)
```

```
          Line Input #1, VarTexto
```

```
          .....
```


- *Development*
 - Add dates file to Access Tables
 - Change population number
 - *Delete term 3*
 - Change module and activity name
 - Change pattern week

Development

REM Module: B31CI3

```
11004      221CI3      B31CI3
11005      221CI3      Engineering Design
11020      221CI3      #SPLUS147609
11036      221CI3      0
11021      221CI3      3
11027      221CI3      -all              0
11027      221CI3      -all              1
11030      221CI3      -all
11039      221CI3      3
11051      221CI3      1
11051      221CI3      0
11061      221CI3      196              264
11063      221CI3      000000000000000000000000000000000111111111100000000000000
11081      221CI3      -all              00000000000000000000000000000000000000000000000000000000000000 0
0
11081      221CI3      +              11111111111111111111111111111111110000000000111111111111110 0
1095
11081      221CI3      +              11111111111111111111111111111111110000000000111111111111111 0
1095
11081      221CI3      +              11111111111111111111111111111111110000000000111111111111112 0
1095
11081      221CI3      +              11111111111111111111111111111111110000000000111111111111113 0
1095
11081      221CI3      +              11111111111111111111111111111111110000000000111111111111114 0
1095
11331      221CI3      -all
11331      221CI3      +
11332      221CI3
11333      221CI3
11334      221CI3
11335      221CI3
REM
```


Development

```
Do Until EOF(1)
Line Input #1, VarText0
```

```
i = nCharactersUntilEmpty(VarText0, 1)
Line = Mid(VarText0, 1, i) 'take id
```

```
Adodc2.Recordset.MoveFirst
Do Until Adodc2.Recordset.EOF
```

```
    If Line = "11000" Then 'declaration part
        myLine = Mid(VarText0, i + 1, Len(VarText0)) 'delete Id (11000)
        j = nCharactersUntilEmpty(myLine, 2)
        hostKey = Mid(VarText0, j, Len(VarText0))
            If (Adodc2.Recordset!hostKey = hostKey) Then 'delete module
                Line Input #1, VarText0
            End If
        End If
    End If
```

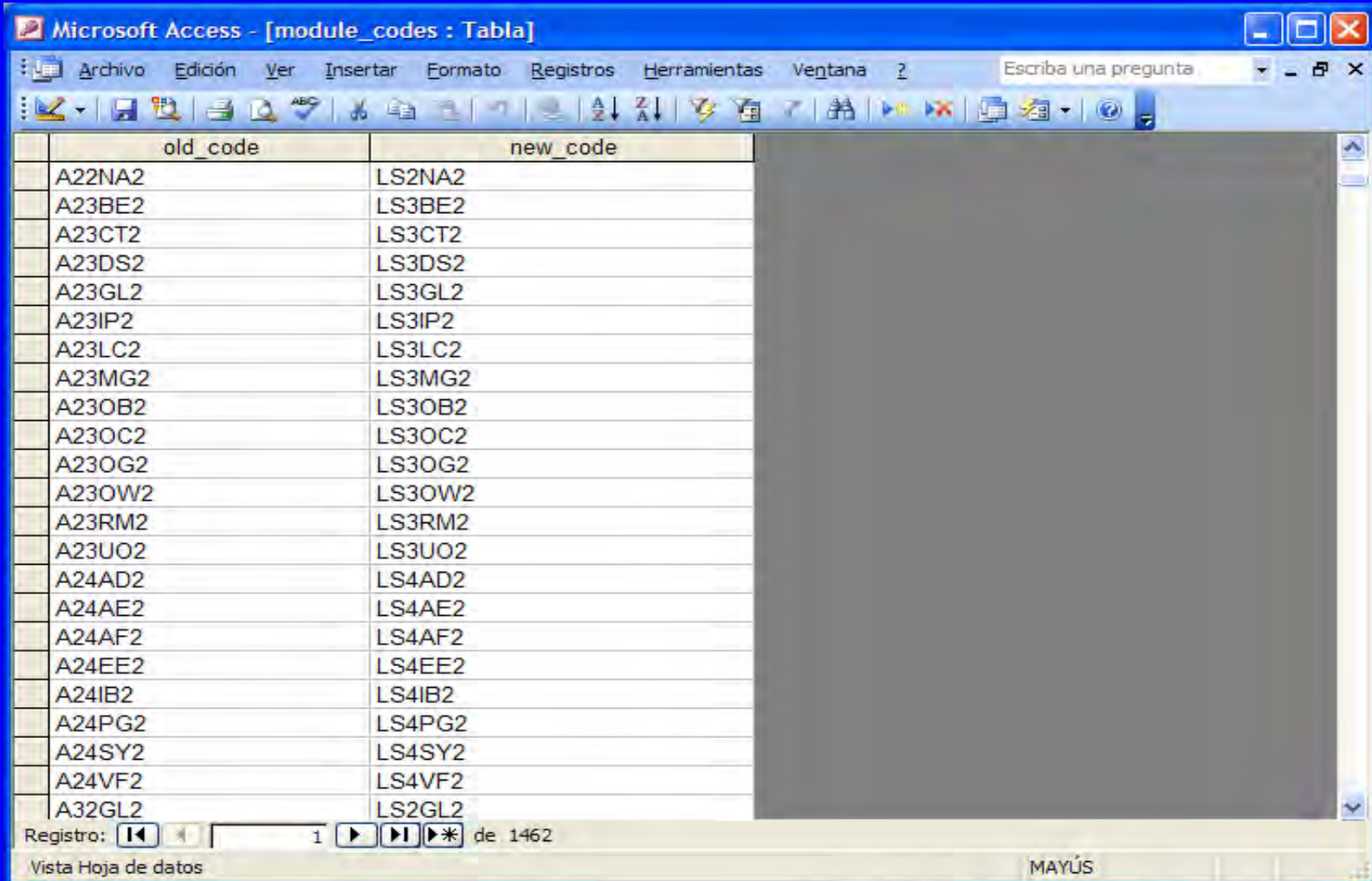
```
    title = Adodc2.Recordset!title
    If Line = "REM Module: " + title Then
        Line Input #1, VarText0
        i = nCharactersUntilEmpty(VarText0, 1)
        Line = Mid(VarText0, 1, i)
        While Line <> "REM"
            Line Input #1, VarText0
            i = nCharactersUntilEmpty(VarText0, 1)
            Line = Mid(VarText0, 1, i)
        Wend
    End If
```

```
Adodc2.Recordset.MoveNext
Loop
```

- *Development*
 - Add dates file to Access Tables
 - Change population number
 - Delete term 3
 - *Change module and activity name*
 - Change pattern week

Development

Module codes



The screenshot shows a Microsoft Access window titled "Microsoft Access - [module_codes : Tabla]". The window displays a table with two columns: "old_code" and "new_code". The table contains 25 rows of data, each representing a module code transition. The status bar at the bottom indicates "Registro: 1 de 1462" and "Vista Hoja de datos".

old_code	new_code
A22NA2	LS2NA2
A23BE2	LS3BE2
A23CT2	LS3CT2
A23DS2	LS3DS2
A23GL2	LS3GL2
A23IP2	LS3IP2
A23LC2	LS3LC2
A23MG2	LS3MG2
A23OB2	LS3OB2
A23OC2	LS3OC2
A23OG2	LS3OG2
A23OW2	LS3OW2
A23RM2	LS3RM2
A23UO2	LS3UO2
A24AD2	LS4AD2
A24AE2	LS4AE2
A24AF2	LS4AF2
A24EE2	LS4EE2
A24IB2	LS4IB2
A24PG2	LS4PG2
A24SY2	LS4SY2
A24VF2	LS4VF2
A32GL2	LS2GL2

Development

Old code **New code**

A11AB2

LS1AB2

A11BP2

LS1BP2

A12GP2

LS2GP2

A12LB2

LS2LB2

A12MB2

LS2MB2

A13BR2

LS3BR2

A13CP2

LS3CP2

Development

```
Adodc2.RecordSource=
```

```
"select old_code, new_code from module_codes"
```

```
If myLine = Adodc2.Recordset!old_code Then 'myLine has the module name
```

```
    VarText = Mid(VarText, 1, nCharactersUntilEmpty(VarText, j + 3)) & Chr(9) & _  
    Adodc2.Recordset!new_code
```

```
End If
```

```
If (Mid(myLine , 1, Len(Adodc2.Recordset!old_code)) = Adodc2.Recordset!old_code) Then
```

```
VarText = Mid(VarText , 1, nCharactersUntilEmpty(VarText, 1)) & Mid(myLine 1, 1,  
    nCharactersUntilEmpty(myLine 1, j)) & Chr(9) & Adodc2.Recordset!new_code &  
    Mid(myLine , Len(Adodc2.Recordset!new_code), Len(myLine ))
```

```
End If
```

- *Development*
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 - *Change pattern week*

Content

10 weeks *4 weeks* *10 weeks* *4 weeks* *10 Weeks* *14 Weeks*

1111111111	0000	0000000000	0000	0000000000	00000...
0000000000	0000	1111111111	0000	0000000000	00000...

Term 1

Term 2

14 weeks *3 weeks* *12 weeks* *3 weeks* *4Weeks* *16 Weeks*

11111111111111	000	000000000000	000	0000	00000...
00000000000000	000	111111111111	000	1111	00000...

Semester 1

Semester 2

Function isTerm 1 and isTerm2

<i>10 weeks</i>	<i>4 weeks</i>	<i>10 weeks</i>	<i>4 weeks</i>	<i>10 Weeks</i>	<i>14 Weeks</i>
1111111111	0000	0000000000	0000	0000000000	00000...
0000000000	0000	1111111111	0000	0000000000	00000...

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Conclusions

- Each request for changes to original data file has been completed successfully.
- However, the upload to the timetable software has shown that problems arise. These problems may result from actions taken by the software to resolve problems of unattached activities.
- There was no time to research these issues in detail. But this can be done using the programmes and cleaner data from Syllabus Plus (no term 3 modules or activities)
- This work has shown that textual replacement is possible but a greater understanding of Syllabus Plus is needed.

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Future work

To improve this project:

- Converting activities into activity templates to allow future scheduling possibilities
- Further investigation to ascertain whether or not Syllabus Plus is causing problems when interpreting a uef file



Timetable Database Restructuring

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