# *Programming III (420-B31-HR)*

# *Assignment 1 – Arrays*

Date assigned: Friday, August 28, 2015

Date Due: Friday, Sept. 11, 2015

***Objectives:***

After completing this assignment, the student should be able to:

1. Draw a class diagram.
2. Read data from a file.
3. Add to, find and traverse an array.

***Problem Specifications:***

Develop a program to read your school timetable from a file named Timetable.txt and store it in arrays. From the command line, your program should allow you to enter a day of the week and hour, and your program will return the course that you are in at that time and the room number. It should also allow you to change the entry in the timetable. Your program should provide the following services:

* Read in the timetable from Timetable.txt and populate the array for each day. The format for Timetable.txt is given at the end of this assignment.
* Provide error checking on the data in Timetable.txt to ensure it is valid. If there is invalid data, then the program should return an error to the user stating “Invalid entry in the Timetable.txt file on line number x”, where x is the line number with the error. The program should then terminate gracefully and not crash.
* Accept input from the user to determine the timetable entry for a given day of the week and time. The user should enter either “M”, “Tu”, “W”, “Th”, “F” as the days of the week. Any other input is invalid and should return the error “Invalid day entered, please enter a different day”. The user should enter a number between 8 and 17 for the time, representing the hour of the day. Any other input is invalid and should return the error “Invalid hour entered, please enter a different hour between 8 and 17”.
* Provide the entry in the timetable for the given day and time. If you do not have a class at that time, the program should output “Free”. If you do have a class at that time, then it should output the course code, such as “420-B31” or “420-E11” and the room number, such as “220” or 136”.
* Accept input from the user to change the entry in the timetable for the given day and time. If the user does not enter a course code in the format “420-B31” or “Free” then the error “Invalid course code” should be displayed. If the user does not enter the room number as a 3 digit number, such as “220” or 136”, then the error “Invalid room number” should be displayed. \*Note that changing the timetable entry should only change the array, and not write to the Timetable.txt file.

Your design must include the following:

* 1. **Hour** class that represents an hour in a day. The Hour class must contain the course number and the room number.
  2. **Day** class that represents a day of the week. The Day class must contain an **array** of **Hour** classes.
  3. **Week** class that represents the five workdays of the week. The Week class must contain an **array** of Day classes.
  4. **Timetable** class that reads in the Timetable.txt file and runs the command line. From the command line you must be able to look up the timetable, and change a timetable entry.

***To Do:***

1. Draw a class diagram for the program. Make sure that all classes listed in the problem specification are included. I recommend showing this to the teacher before you proceed with coding, to ensure you are correct.
2. Code the program and fully test the program for all error conditions described in the specification. You must use arrays where specified in this assignment to obtain a passing grade.

***Marking Scheme:***

|  |  |  |
| --- | --- | --- |
|  | **Mark** | **Out of** |
| Class Diagram |  | 10 |
| Hour class code |  | 10 |
| Day class code |  | 10 |
| Week class code |  | 10 |
| Timetable class code – loads Timetable.txt file, command line execution for accessing and updating timetable. |  | 30 |
| Correct execution |  | 10 |
| Organization |  | 5 |
| **Total** |  | **85** |

***Organization Marks:***

Marks will be given for organization. This includes:

* naming files and folders according to the department standards
* giving meaningful names to variables, classes, objects and methods
* formatting and indenting Java classes using the Eclipse format tool
* submitting the assignment in correctly on **Moodle**
* including all required files in the submitted assignment folder
* using the same version of Visual Paradigm as the lab version for class diagrams.

***To be handed in:***

The following files should be included in a ***username*\_B31\_A01\_Arrays** folder and uploaded to **Moodle**:

1. The class diagram for the assignment.
2. The java project for the assignment. The project name should be ***username*\_B31\_A01\_Arrays** .

# Timetable.txt file format:

Each line should have a single day and hour on it. No hour should be skipped.

M 8 420-E11 219

M 9 420-E11 219

M 10 420-E11 219

M 11 420-E11 219

M 12 FREE

M 13 FREE

M 14 420-B31 221

M 15 FREE

M 16 345-102 125

M 17 345-102 125

TU 8 420-C30 220

TU 9 420-C30 220

TU 10 420-C30 220

TU 11 FREE

TU 12 FREE

TU 13 420-E11 126

TU 14 FREE

TU 15 420-C30 108

TU 16 420-B31 220

TU 17 FREE

W 8 420-D10 219

W 9 420-D10 219

W 10 420-D10 219

W 11 420-D10 219

W 12 FREE

W 13 FREE

W 14 420-B31 221

W 15 FREE

W 16 345-102 125

W 17 345-102 125

TH 8 FREE

TH 9 FREE

TH 10 420-C30 221

TH 11 FREE

TH 12 FREE

TH 13 420-E11 126

TH 14 FREE

TH 15 420-C30 108

TH 16 420-B31 220

TH 17 FREE

F 8 420-D10 219

F 9 420-D10 219

F 10 420-D10 219

F 11 420-D10 219

F 12 FREE

F 13 FREE

F 14 FREE

F 15 FREE

F 16 FREE

F 17 FREE