

## **PROGRAMMING PROJECT #2**

### **Purpose:**

- Define class using OO approach
- Understand how to create and manipulate list of objects
- Handle input errors and invalid values
- Design and create a well-structure program using basic programming constructs and classes.

### **General Requirements:**

- Must handle the following errors: no command line argument for data file name is given, negative number of units, negative course id and session number must be unique.
- All data members must be declared as private
- Must produce expected output including all informational messages
- Commands are case-insensitive. "Catalog" and "catalog" should produce the same command output.
- The search is by "word" and not "substring". In another words, "all" is not found in "Hallo" string
- Word search is case-insensitive. "java" and "Java" should produce the same search result.
- "save" and "catalog" should have the exact same output except one to go to the display and the other goes to the given file name.

### **"Available commands"**

- end  
Terminate the program
- help  
Show all available commands
- catalog  
Show all available course in the catalog
- addcourse  
Add a new course to the catalog (id, session number, units and title)
- search word  
Show all courses in the catalog that contains the given word in the id or the title
- units>= number  
Show all courses in the catalog that has the number of units equal or greater than the given number
- save filename  
Save the current list to the given file

Here is the minimum list of classes that you must have:

**“Course”** class

- Manages a course (id, session number, number of units, and title)

**“CourseCatalog”** class

- Manages a list of Courses. It provides operations such as search, print and add new courses.

**“ManageCourses”** class

Implement the main program that reads in the data file given in the command line. It processes all the commands to manage the courses in the catalog.

Here is a sample of the catalog data file (e.g. “catalog.txt”):

```
CIS001  43045  2  Computer Literacy
CIS002  47341  4  Introduction to Computing
CIS002  48462  4  Introduction to Computing
CIS002  47344  4  Introduction to Computing
CIS004A 48450  4  C++ Programming
CIS004A 48452  4  C++ Programming
CIS004A1 48453  4  Computer Programming I ( Java )
CIS004B 48460  4  Computer Programming II (C++)
CIS007  45552  4  Python Programming
CIS037A 45553  4  Introduction to C Programming
CIS043  45557  4  Software Development With Java
CIS044  45559  4  Introduction to Data Structure Using Java
CIS045  45561  3  Linux Essential I
CIS048  46555  3  Linux System Administration
CIS060  45564  4  Mobile Apps Programming
```

### **Sample Output**

```
C:\>java ManageCourses
Invalid usage. Please give a data file name.
Syntax: java ManageCourses catalog-data-file-name
```

```
C:\>java ManageCourses catalog.txt
```

Welcome to the Course Catalog

Please enter a command.

Type in 'help' for more info and 'end' to exit the program.

**help**

- end  
Terminate the program
- help  
Show all available commands
- catalog  
Show all available course in the catalog
- addcourse  
Add a new course to the catalog (id, session number, units and title)
- search word  
Show all courses in the catalog that contains the given word in the id or the title
- units>= number  
Show all courses in the catalog that has the number of units equal or greater than the given number
- save filename  
Save the current list to the given file

**abc**

Invalid command.

**display**

Invalid command.

**save**

Invalid command.

**addcourse**

Please enter the course id: CIS010

Please enter the session number: 6111

Please enter the number of units: 5

Please enter the title: Computer Programming Lab

Add a course successfully.

**catalog**

```
CIS001 43045 2 Computer Literacy
CIS002 47341 4 Introduction to Computing
CIS002 48462 4 Introduction to Computing
CIS002 47344 4 Introduction to Computing
CIS004A 48450 4 C++ Programming
CIS004A 48452 4 C++ Programming
CIS004A1 48453 4 Computer Programming I ( Java )
CIS004B 48460 4 Computer Programming II (C++)
CIS007 45552 4 Python Programming
CIS037A 45553 4 Introduction to C Programming
CIS043 45557 4 Software Development With Java
CIS044 45559 4 Introduction to Data Structure Using Java
CIS045 45561 3 Linux Essential I
CIS048 46555 3 Linux System Administration
CIS060 45564 4 Mobile Apps Programming
CIS010 6111 5 Computer Programming Lab
```

**save catalog2.txt**

Saved successfully.

**search java**

CIS004A1 48453 4 Computer Programming I ( Java )  
CIS043 45557 4 Software Development With Java  
CIS044 45559 4 Introduction to Data Structure Using Java

**search programming**

CIS004A 48450 4 C++ Programming  
CIS004A 48452 4 C++ Programming  
CIS004A1 48453 4 Computer Programming I ( Java )  
CIS004B 48460 4 Computer Programming II (C++)  
CIS007 45552 4 Python Programming  
CIS037A 45553 4 Introduction to C Programming  
CIS060 45564 4 Mobile Apps Programming  
CIS010 6111 5 Computer Programming Lab

**search ruby**

"ruby" is found in the catalog.

**units>= 4**

CIS002 47341 4 Introduction to Computing  
CIS002 48462 4 Introduction to Computing  
CIS002 47344 4 Introduction to Computing  
CIS004A 48450 4 C++ Programming  
CIS004A 48452 4 C++ Programming  
CIS004A1 48453 4 Computer Programming I ( Java )  
CIS004B 48460 4 Computer Programming II (C++)  
CIS007 45552 4 Python Programming  
CIS037A 45553 4 Introduction to C Programming  
CIS043 45557 4 Software Development With Java  
CIS044 45559 4 Introduction to Data Structure Using Java  
CIS060 45564 4 Mobile Apps Programming  
CIS010 6111 5 Computer Programming Lab

**units>= 5**

CIS010 6111 5 Computer Programming Lab

**addcourse**

Please enter the course id: CIS011

Please enter the session number: -1

Invalid session number. Please try it again.

Please enter the session number: -2

Invalid session number. Please try it again.

Please enter the session number: 43045

Invalid session number. Session already exists. Please try it again.

Please enter the session number: 46555

Invalid session number. Session already exists. Please try it again.

Please enter the session number: 6111

Invalid session number. Session already exists. Please try it again.

Please enter the session number: 7222  
Please enter the number of units: -5  
Invalid unit number. Please try it again.  
Please enter the number of units: -1  
Invalid unit number. Please try it again.  
Please enter the number of units: 2  
Please enter the title: Computer Basics  
Add a course successfully.

**catalog**

CIS001 43045 2 Computer Literacy  
CIS002 47341 4 Introduction to Computing  
CIS002 48462 4 Introduction to Computing  
CIS002 47344 4 Introduction to Computing  
CIS004A 48450 4 C++ Programming  
CIS004A 48452 4 C++ Programming  
CIS004A1 48453 4 Computer Programming I ( Java )  
CIS004B 48460 4 Computer Programming II (C++)  
CIS007 45552 4 Python Programming  
CIS037A 45553 4 Introduction to C Programming  
CIS043 45557 4 Software Development With Java  
CIS044 45559 4 Introduction to Data Structure Using Java  
CIS045 45561 3 Linux Essential I  
CIS048 46555 3 Linux System Administration  
CIS060 45564 4 Mobile Apps Programming  
CIS010 6111 5 Computer Programming Lab  
CIS011 7222 2 Computer Basics

**save catalog3.txt**

Saved successfully.

**quit**

Invalid command.

**end**

Thank you for using the program. Goodbye.

**EXTRA CREDIT:**

Enhance the program to support the following features:

1. "edit" command to allow users to change the course information
2. "search" for distinct words with other non-alphabet characters such as (java) versus ( java ) or "java" versus " java " or "java." versus "java ."
3. Better "units" command that accepts the comparison operators as the argument such as  
units >= 5  
units > 5  
units == 5  
units < 5  
units <= 5