

Spring 2018 – 2ndTerm 2018

Course Code: CPCS202

Course Name: Programming I

Assignment # 02 (KAU Library)

Assigned Date : Sunday 4/3/2018

Course Learning Outcomes (CLOs 1,2,3,4,5,6,7) SOs c c b a a a a

1. Construct algorithms for solving simple problems.
2. *Use a programming language to implement, test, and debug algorithms for solving simple problems.
3. Analyze and explain the behavior of simple programs involving the fundamental programming constructs.
4. Identify and describe uses of primitive data types and standard library functions/methods.
5. Write programs that use primitive data types and standard library functions/methods.
6. Apply appropriate conditional and iteration constructs for a given programming task.
7. Write and/or modify short programs that use standard conditional structures.

Submission Guidelines and Rules

1. This program must ONLY be submitted on the Blackboard!
2. This is an INDIVIDUAL project. You must solve it on your own. Any form of plagiarism will result in receiving -4 (less than zero) in the project.
3. This project worth 6% of the overall module marks (100%).
4. **Important Note:** If a student cheated on a project for the second time. He/ she will receive **Grade F** in the course .
5. Submit your assignment on the Blackboard ONLY and must be Java file containing the Java code .
6. Your program should include a header comment with the following information: your name, **email**, course number, section number, assignment title, and date.
7. Your program should look EXACTLY like the sample run given in this PDF.
8. **The grade distribution (Main Menu 5%- Input and Input Validation 20%- Borrow option 35%- and**

Read and fully understand this document BEFORE starting the program!
Once the solution is 100% clear to you, and then begin making your code.

Happy Coding & Start Early!!☺

Project 2 Description:

Suppose a University Library (like **KAU Library**) has provided the KAU members (faculty members, staff, Phd/Master students, Undergraduate students and others) the facilities of borrowing books. Information of borrowing and returning books are entered by user at runtime.

Write a Java program that allows the user to enter the required information such as Identity number, First name, Last name, Category (faculty members, staff, PhD/Master students, Undergraduate students and Other), and other required information. The program then displays the output similar to the one shown below. You should study the sample runs (output) of the program to identify for yourself what is required.

Input validation

The user has to enter **Borrow** (Upper case or lower) for Borrowing books, **Return** (Upper case or lower) for Returning books and **Exit** (Upper case or lower) for exiting from the program. Then, user will enter **F or f (for Faculty members)**, **S or s (for Staff)**, **G or g (for PhD/Master Students)**, **U or u (for Undergraduate Students)** and **O or o (for Others)**. Next, the user will enter the number of books for borrowing or returning. Finally the user will enter the remaining information.

1. If the user inputs a character that is not recognized (NOT from **F, f, S, s, G, g, U or u, O or o**) for category name, then the program displays *“Wrong Selection of category name!”*, and exits.
2. If the user inputs a word that is not recognized (NOT **Borrow, Return or Exit**) for transaction type, then the program displays *“Wrong Selection of transaction type!”*, and exits.
3. If the user inputs number of books greater than number of books allowed for that category, the program displays *“Sorry! Number of books are exceeding the allowed quantity!”*, and exits.
4. If the user enters **O or o** for other member, then he should also enter the following information: (number of allowed books, number of allowed months) for **Borrowing** transaction and same information plus percentage of penalty for **returning** transaction.
5. You have to calculate the **penalties** if the member returns the books after due date, according to the data mentioned in the table below.
6. The program output should be similar to the one shown below. **You should strictly make sure your output is 100% identical to the output shown below.**

Type	Designation	# of books Allowed	# of days/Month Allowed	Penalty Per Book
Borrowing	KAU Staff	10	4 Months	50% of Price
	Employee	8	3 Months	40% of Price
	PhD/Master Student	6	1 Months	30% of Price
	Under Graduate Student	3	15 Days	20% of Price
	Other Member	User Input		

ⓘ Information: For Other Member Choice: Number of books allowed, days/months and penalty per book are asked by user and later used for calculation **[see sample Program Run#13]**

Note: you can use statement `System.exit(0);` to exit from the program

The program should display a Menu, like the one shown in sample output, for the user to choose options.

Sample Program Run #1

```
-----  
Welcome to KAU Library  
-----  
Enter "Borrow" for Borrowing Books  
Enter "Return" for Returning Books  
Enter "Exit" for Exiting the Program  
Enter the Choice: lend  
  
Wrong Selection of Transaction Type!
```

Sample Program Run #2

```
-----  
Welcome to KAU Library  
-----  
Enter "Borrow" for Borrowing Books  
Enter "Return" for Returning Books  
Enter "Exit" for Exiting the Program  
Enter the Choice: borrow  
  
Press F or f for Faculty Members:  
Press S or s for Staff:  
Press G or g for PhD/Master Student:  
Press U or u for Undergraduate Student:  
Press O or o for Other Member:  
Enter the Choice: a  
  
Wrong Selection of member type!
```

Sample Program Run #3

```
-----  
Welcome to KAU Library  
-----  
Enter "Borrow" for Borrowing Books  
Enter "Return" for Returning Books  
Enter "Exit" for Exiting the Program  
Enter the Choice: borrow  
  
Press F or f for Faculty Members:  
Press S or s for Staff:  
Press G or g for PhD/Master Student:  
Press U or u for Undergraduate Student:  
Press O or o for Other Member:  
Enter the Choice: f  
  
Enter the number of books being borrowed: 12  
  
Sorry! Number of books are exceeding the allowed quantity!
```

Sample Program Run #4

Welcome to KAU Library

Enter "Borrow" for Borrowing Books
Enter "Return" for Returning Books
Enter "Exit" for Exiting the Program
Enter the Choice: **Borrow**

Press F or f for Faculty Members:
Press S or s for Staff:
Press G or g for PhD/Master Student:
Press U or u for Undergraduate Student:
Press O or o for Other Member:
Enter the Choice: **F**

Enter the number of books being borrowed: **8**
Enter the Name (First and Last): Ahmed Alzahrani
Enter ID: 1234567

Information Details for **BORROWING**

Name	: AHMED ALZHRANI	Identity Number	: 1234567
Member Category	: Faculty Member	Number of Borrowed Books:	8
Number of Allowed Months:	4	Number of Allowed Books :	10

*** Thank you for Visiting ***

Sample Program Run #5

Welcome to KAU Library

Enter "Borrow" for Borrowing Books
Enter "Return" for Returning Books
Enter "Exit" for Exiting the Program
Enter the Choice: **BORRow**

Press F or f for Faculty Members:
Press S or s for Staff:
Press G or g for PhD/Master Student:
Press U or u for Undergraduate Student:
Press O or o for Other Member:
Enter the Choice: **U**

Enter the number of books being borrowed: **2**
Enter the Name (First and Last): Tourky Alqarni
Enter ID: 1234567

Information Details for **BORROWING**

Name	: TOURKY ALQARNI	Identity Number	: 1234567
Member Category	: Undergraduate	Number of Borrowed Books:	2
Number of Allowed Days :	15	Number of Allowed Books :	3

*** Thank you for Visiting ***

Sample Program Run #6

Welcome to KAU Library

Enter "Borrow" for Borrowing Books
Enter "Return" for Returning Books
Enter "Exit" for Exiting the Program

Enter the Choice: **Return**

Press F or f for Faculty Members:
Press S or s for Staff:
Press G or g for PhD/Master Student:
Press U or u for Undergraduate Student:
Press O or o for Other Member:

Enter the Choice: **O**

Enter the number of books returning: **5**
Enter the number of holding months: **3**
Enter the number of months allowed: **4**
Enter the name (first and last): **Fahd Alotaibi**
Enter ID: **1352487**

Information Details for RETURNING

Name	: FAHD ALOTAIBI	Identity Number	: 1352487
Member Category	: Other	Number of Borrowed Books:	5
Number of Allowed Months:	4	Number of Holding Months:	3

*** Thank you for Visiting ***

Sample Program Run #7

Welcome to KAU Library

Enter "Borrow" for Borrowing Books
Enter "Return" for Returning Books
Enter "Exit" for Exiting the Program

Enter the Choice: **Borrow**

Press F or f for Faculty Members:
Press S or s for Staff:
Press G or g for PhD/Master Student:
Press U or u for Undergraduate Student:
Press O or o for Other Member:

Enter the Choice: **O**

Enter the number of books being borrowed: 5
Enter the number of books allowed: 6
Enter the number of months allowed: 3
Enter the name (first and last): Omar Ahmed
Enter ID: 1265342

Information Details for **BORROWING**

Name	: OMAR AHMED	Identity Number	: 1265342
Member Category	: Other	Number of Borrowed Books:	5
Number of Allowed Months:	3	Number of Allowed Books :	6

*** Thank you for Visiting ***

Sample Program Run #8

Welcome to KAU Library

Enter "Borrow" for Borrowing Books
Enter "Return" for Returning Books
Enter "Exit" for Exiting the Program

Enter the Choice: Return

Press F or f for Faculty Members:
Press S or s for Staff:
Press G or g for PhD/Master Student:
Press U or u for Undergraduate Student:
Press O or o for Other Member:

Enter the Choice: F

Enter the number of books returning: 8
Enter the number of holding months: 2
Enter the name (first and last): Ahmed Alghamdi
Enter ID: 1654821

Information Details for **RETURNING**

Name	: AHMED ALGHAMDI	Identity Number	: 1654821
Member Category	: Faculty Member	Number of Borrowed Books:	8
Number of Allowed Months:	4	Number of Holding Months:	2

*** Thank you for Visiting ***

Sample Program Run #9

Welcome to KAU Library

Enter "Borrow" for Borrowing Books
Enter "Return" for Returning Books
Enter "Exit" for Exiting the Program

Enter the Choice: **return**

Press F or f for Faculty Members:
Press S or s for Staff:
Press G or g for PhD/Master Student:
Press U or u for Undergraduate Student:
Press O or o for Other Member:

Enter the Choice: **g**

Enter the number of books returning: **4**
Enter the number of holding months: **1**
Enter the name (first and last): **Ali Alshehri**
Enter ID: **1258951**

Information Details for RETURNING

Name	: ALI ALSHEHRI	Identity Number	: 1258951
Member Category	: Graduate	Number of Borrowed Books:	4
Number of Allowed Months:	1	Number of Holding Months:	1

*** Thank you for Visiting ***

Sample Program Run #10

Welcome to KAU Library

Enter "Borrow" for Borrowing Books
Enter "Return" for Returning Books
Enter "Exit" for Exiting the Program

Enter the Choice: **Return**

Press F or f for Faculty Members:
Press S or s for Staff:
Press G or g for PhD/Master Student:
Press U or u for Undergraduate Student:
Press O or o for Other Member:

Enter the Choice: **u**

Enter the number of books returning: **2**
Enter the number of holding days: **20**
Enter the total prices of the books: **200**
Enter the name (first and last): **Ali Alshomrani**
Enter ID: **1296345**

Information Details for RETURNING

Name	: ALI ALSHOMRANI	Identity Number	: 1296345
Member Category	: Undergraduate	Number of Borrowed Books:	2
Number of Allowed Days	: 15	Number of Holding Days	: 20
Total Price	: 200.00	Penalty	: 40.00 SAR

You exceeded the allowed period! The Penalty is "20%" of original price of the books.

*** Thank you for Visiting ***

Sample Program Run #11

```
-----  
Welcome to KAU Library  
-----  
Enter "Borrow" for Borrowing Books  
Enter "Return" for Returning Books  
Enter "Exit" for Exiting the Program  
Enter the Choice: Borrow  
  
Press F or f for Faculty Members:  
Press S or s for Staff:  
Press G or g for PhD/Master Student:  
Press U or u for Undergraduate Student:  
Press O or o for Other Member:  
Enter the Choice: O  
  
Enter the number of books being borrowed: 5  
Enter the number of books allowed: 4  
  
Sorry! Number of books are exceeding the allowed quantity!
```

Sample Program Run #12

```
-----  
Welcome to KAU Library  
-----  
Enter "Borrow" for Borrowing Books  
Enter "Return" for Returning Books  
Enter "Exit" for Exiting the Program  
Enter the Choice: return  
  
Press F or f for Faculty Members:  
Press S or s for Staff:  
Press G or g for PhD/Master Student:  
Press U or u for Undergraduate Student:  
Press O or o for Other Member:  
Enter the Choice: w  
  
Wrong Selection of member type!
```

Sample Program Run #13

Welcome to KAU Library

Enter "Borrow" for Borrowing Books
Enter "Return" for Returning Books
Enter "Exit" for Exiting the Program

Enter the Choice: ReTuRN

Press F or f for Faculty Members:
Press S or s for Staff:
Press G or g for PhD/Master Student:
Press U or u for Undergraduate Student:
Press O or o for Other Member:

Enter the Choice: O

Enter the number of books returning: 5
Enter the number of holding months: 4
Enter the number of months allowed: 3
Enter the total prices of the books: 350
Enter Penalty Percentage per book: 15
Enter the name (first and last): Meshari Ahmed
Enter ID: 1532647

Information Details for RETURNING

Name	: MESHARI AHMED	Identity Number	: 1532647
Member Category	: Other	Number of Borrowed Books:	5
Number of Allowed Months:	3	Number of Holding Months:	4
Total Price	: 350.00	Penalty	: 52.50 SAR

You exceeded the allowed period! The Penalty is "15%" of original price of the books.

*** Thank you for Visiting ***