Concordia University
Computer Science & Software Engineering
Faculty of Engineering and Computer Science

**Concordia University**
**COMP 248 – Fall 2015**
**Revised Assignment 1**
**Note:** Revisions are marked in green

| | |
|---|---|
| **New Due Date:** | By 11:59pm Wednesday **October 7,** 2015 |
| **Evaluation:** | 3% of final mark (see marking rubric at the end of handout) |
| **Late Submission:** | none accepted |
| **Purpose:** | The purpose of this assignment is to help you learn the Java selection and flow of control statements, if, if/else, while and do/while loops - can use for loops but not required. |
| **CEAB/CIPS Attributes:** | Design/Problem analysis/Communication Skills |

**General Guidelines When Writing Programs:**

- Include the following comments at the top of your source codes

```
// -------------------------------------------------------
// Assignment (include number)
// Written by: (include your name(s) and student id(s))
// For COMP 248 Section (your section) – Fall 2015
// -------------------------------------------------------
```

- In a comment, give a general explanation of what your program does. As the programming questions get more complex, the explanations will get lengthier.
- Include comments in your program describing the main steps in your program.
- Display a welcome message.
- Display clear prompts for users when you are expecting the user to enter data from the keyboard.
- All output should be displayed with clear messages and in an easy to read format.
- End your program with a closing message so that the user knows that the program has terminated.

## Question 1

Write a program that asks the user how many males and females are registered in the class. Once that information is entered your program should display the total number of students registered in the class and the percentage of male and female students, in both decimal and percentage notation. You can assume the user will enter valid integers.

Here are a few sample outputs to illustrate the expected behavior of your program.

Note: user input is highlighted in grey.

```
-----------------------------------------------------------
          Nancy's Male/Female Ratio Program
-----------------------------------------------------------

How many female students are registered for your course?
33

How many male students are registered for your course?
55
Congratulations! You have 88 students registered in your course.
       Percentage of females = 0.375 or ~37%
       Percentage of males = 0.625 or ~62%
Have a good term!!!
```

```
-----------------------------------------------------------
          Nancy's Male/Female Ratio Program
-----------------------------------------------------------

How many female students are registered for your course?
72

How many male students are registered for your course?
27
Congratulations! You have 99 students registered in your course.
       Percentage of females = 0.7272727272727273 or ~72%
       Percentage of males = 0.2727272727272727 or ~27%
Have a good term!!!
```

## Question 2

**Write a program that:**

**asks the user to enter a date. You are to read each part of the date into its own integer type variable. The year should be a 4 digit number. You can assume the user enters a correct date (no error checking required).**

- **determines whether the entered date is a magic date. Here are the rules for a magic date:**
  - **mm*dd is a 1-digit number that matches the last digit of yyyy**
  - **mm*dd is a 2-digit number that matches the last 2 digits of yyyy**
  - **mm*dd is a 3-digit number that matches the last 3 digits of yyyy, */**
- **The program should then display the date in the form dd/mm/yyyy sand indicate if the date is magic, or not magic if it is not.**

Here are a few sample outputs to illustrate the expected behavior of your program.
Note: user input is highlighted in grey.

```
-------------------------------------------------------
          Nancy's Magic Date Program
-------------------------------------------------------

Enter a date as mm dd yyyy and I will tell you if it is magic or not:
1 1 2011
1/1/2011 is a magic date!!!!

Come back for another try sometime!
```

```
-------------------------------------------------------
          Nancy's Magic Date Program
-------------------------------------------------------

Enter a date as mm dd yyyy and I will tell you if it is magic or not:
4 1 2001
4/1/2001 is NOT a magic date!!!

Come back for another try sometime!
```

```
-------------------------------------------------------
          Nancy's Magic Date Program
-------------------------------------------------------

Enter a date as mm dd yyyy and I will tell you if it is magic or not:
2 12 2024
2/12/2024 is a magic date!!!!

Come back for another try sometime!
```

```
-------------------------------------------------------
          Nancy's Magic Date Program
-------------------------------------------------------

Enter a date as mm dd yyyy and I will tell you if it is magic or not:
12 12 2015
12/12/2015 is NOT a magic date!!!

Come back for another try sometime!
```

## Question 3

An internet service provider has three different subscription packages for its customers:

Package A: For $9.95/month 10 hours of access are provided. Additional hours are $2.00 per hour.

Package B: For $13.95/month 20 hours of access are provided. Additional hours are $1.00 per hour.

Package C: For $19.95/month unlimited access is provided.

Write a program that calculates a customer's monthly bill. It should ask the user to enter the letter of the package the customer has purchase (A, B or C) and the number of hours that were used. It should display the total charge **and possible savings in the following way. If the user has package A then see if the bill would be cheaper with package B or C. If the user has package B see if it would be cheaper for the user to have package C. If the user has package C then no comparison is needed. If it would be cheaper for the user to upgrade to a higher package say so with the saving on the current bill.** If there would be no savings, no message should be printed. **If the user has entered a package other than A, B or C then an error message should display telling the user there is no such package.**
Here are a few sample outputs to illustrate the expected behavior of your program.
Note: user input is highlighted in grey.

```
-----------------------------------------------------
       Nancy's Internet Use Monthly Bill Program
-----------------------------------------------------

How many hours did you use (whole number please): 10
Do you have package A, B or C? S

      Your monthly bill with Package S is $--.--
Sorry but unable to calculate your monthly bill since Package S does not exist.

Come back next month ...
```

```
-----------------------------------------------------
       Nancy's Internet Use Monthly Bill Program
-----------------------------------------------------

How many hours did you use (whole number please): 15
Do you have package A, B or C? A

      Your monthly bill with Package A is $19.95
      If you were on Package B you could have saved $6.0

Come back next month ...
```

```
-----------------------------------------------------
       Nancy's Internet Use Monthly Bill Program
-----------------------------------------------------

How many hours did you use (whole number please): 20
Do you have package A, B or C? A

      Your monthly bill with Package A is $29.95
      If you were on Package B you could have saved $16.0
      If you were on Package C you could have saved $10.0

Come back next month ...
```

```
--------------------------------------------------
       Nancy's Internet Use Monthly Bill Program
--------------------------------------------------

How many hours did you use (whole number please): 23
Do you have package A, B or C? B

       Your monthly bill with Package B is $16.95

Come back next month ...
```

```
--------------------------------------------------
       Nancy's Internet Use Monthly Bill Program
--------------------------------------------------

How many hours did you use (whole number please): 10
Do you have package A, B or C? C

       Your monthly bill with Package C is $19.95

Come back next month ...
```

```
--------------------------------------------------
       Nancy's Internet Use Monthly Bill Program
--------------------------------------------------

How many hours did you use (whole number please): 33
Do you have package A, B or C? B

       Your monthly bill with Package B is $26.95
       If you were on Package C you could have saved $7.0

Come back next month ...
```

## Submitting Assignment 1

- Zip the source code (the .java file only please) of this assignment.
- Naming convention for zip file: Create one zip file, containing the source files for your assignment using the following naming convention:
  - The zip file should be called *a#_studentID*, where # is the number of the assignment and *studentID* is your student ID number.
    For example, for the first assignment, student 123456 would submit a zip file named a1_123456.zip
- Submit your zip file at: https://fis.encs.concordia.ca/eas/
- Submit your assignment as "**Programming Assignment**" and select Submission **1** for assignment #1. **Assignments not submitted to the correct location will not be graded.**
- **Be sure to keep your submission confirmation email.**

## **Evaluation Criteria for Assignment 1** (20 points)

| **Source Code** | |
|---|---|
| **Comments for all 3 questions (5 pts.)** | |
| Description of the program (authors, date, purpose) | 2 pts. |
| Description of variables and constants | 1 pt. |
| Description of the algorithm | 2 pts. |
| **Programming Style for all 3 questions (3 pts.)** | |
| Use of significant names for identifiers | 1 pt. |
| Indentation and readability | 1 pt. |
| Welcome Banner/Closing message | 1 pt. |
| **Question 1 (3 pts.)** | |
| Prompting user/reading data | 1 pt. |
| Calculation of total students & percentage | 1 pt. |
| Display results | 1 pt. |
| **Question 2 (3 pts.)** | |
| Read in date | 1 pt. |
| Calculation of total students & percentage | 1 pt. |
| Display results | 1 pt. |
| **Question 3 (6 pts.)** | |
| Prompting user/reading data | 1 pt. |
| Cost with user's package | 2 pts. |
| Savings with other package(s) | 2 pts. |
| Display results | 1 pt. |
| **TOTAL** | **20 pts.** |