Lab Session 3 – Week 4

1. Listen the **first video** available in the 'computer lab 3' in Blackboard.

2. Download the code Salary.java from Blackboard. Modify the code adding the following requirements (one by one):

   a. The input will be number of hours worked in a week (it will not be normal and extra hours).
   b. Calculate the salary as: for the first 40 hours worked in a week the pay rate is $10/hour and after that initial 40 hours the pay rate is $15/hour
   c. Calculate the total salary after **5 weeks**. You need to input the number of worked hours every week. For every single week, the salary for that week will be calculated as stated in **b**. Use a `while`, `do-while` or `for` to complete this task.
   d. Test your code. Try the following inputs (number of hours every week)
      - 10 50 60 20 30 *(the result is 1850)*
      - 0 10 20 30 40 *(the result is 1000)*
      - 40 39 41 45 50 *(the result is 2230)*
      - 20 -1 10 10 10 *(invalid input)*
   e. Add the following bonus: If the total salary (for the entire 5 weeks) is less or equal to $1000, the employee will receive 10% bonus. If the salary is greater than $1000 and less or equal to $2000, the employee will receive 5% bonus. If the salary is greater than $2000 and less or equal to $3000, the employee will receive 1% bonus.
      At this point you should show your code to your demonstrator. Your code should be easy to read (use indentation) and should have a comment block at the top of the file (date, name and student number).
   f. Add name as input: in the beginning of the program, the user will input the name of the employee. In the end of the program, the output should be "Salary of <name> is <value>". If the employee received bonus, the output should include "which includes x% bonus", where x should be 1% or 5% or 10% as stated in e.
   g. In the loop statement, try to use `while`, `do-while` and `for`. Listen the **second video** to understand the difference between `while`, `do-while` or `for`.
   h. Instead of 5 weeks, consider changing the program so that the number of weeks is an input.

3. Write a program that calculates the repayment/month when you buy a product which will be paid off in M months with an interest calculated monthly. Inform the user how much the total interest is at the end of the period. This exercise was discussed last lecture. See more details in the lecture slides.

4. Using the program structure templates provided via the program files ExampleTio.java and ExampleGui.java that you can download from Blackboard, write a Java program for the problems given below. Try to use GUI and TIO. The **third video** shows an implementation using TIO and GUI.

   a. $2 + 4 + 6 + \ldots + n$, where n is input
   b. $(1/2)^2 + (2/3)^2 + (3/4)^2 + \ldots + (n\text{-}1/n)^2$, where n is input
   c. $1*3 + 3*5 + 5*7 + \ldots + n*(n+2)$, where n is input
   d. $1! -3! + 5! - 7! + \ldots + n!$, where n is input

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1. Modify the Java source code from exercise 1 (above) to use GUI.
2. Explore the Java API documentation at http://docs.oracle.com/javase/9/docs/api
   a. Check the different methods in Math class. Try to use a couple of them in the exercises 2 above.

Try to do all exercises! Ask a lot of questions to your demonstrators!
Discuss different approaches for the same problem! Compare with your friends!
If you can't finish during the tutorials, finish any other time in the labs or in your home.
Use the discussion board/PASS/Help Desk to ask questions.

Prof Regina Berretta
Mar - 18