

# CS 1341 – Lab #2

## PRE-LAB [10 points]

**Must be done prior to your lab session .**

Create a Java program named Retirement.java that prompts for your current age and retirement age. It then calculates and displays the total number of years until retirement.

```
$ java Retirement
What is your current age? 21
What is your retirement age? 65
You have 44 years until retirement
```

**Bring the compiled program (.class file) along with the .java source file to your lab session. Demonstrate the working program to your lab instructor for pre-lab credit.**

## LAB [90 points]

NOTES: Use the given notes as a guide for the program logic. These comments must be included in the programs to explain the logic followed.

Each program should compile without errors and should run to produce outputs described for each exercise. The following points will be discounted if the related element is missing or incorrect:

Reasonable output formatting [20 points]

Proper names for classes and variables [15 points]

Comments [15 points]

Program doesn't compile [ 20 points]

Source code (java files) missing [ points specified for each problem below]

The following programs are all based on the spreadsheet assignments you completed for lab 1. Complete the code for each of the three programs so they compile and run successfully.

**This assignment is due by 6:00AM Saturday, February 11, 2023.**

Submit the *java* and *class* files via Canvas (as a single zip-file). Include a comment block at the top of each *Java* file that includes your name, student id number, and "Lab 2-Spring 2023".

**Problem 1** [30 points] – Create a Java program to solve the Salary vs Contract problem from Lab 1. Use Scanner to prompt the user for the 8 initial values and store each value in a variable. Be sure to choose the correct primitive type for each of these variables (e.g. double vs int.) Use those values to calculate the remaining values and print matching the format shown below. (Hints: This program will require several variables, and printf with formatting symbols will help you match the sample output)

```

Enter annual salary: 80000
Enter hourly contract rate: 70
Enter project duration in months: 10
Enter work hours per day: 8
Enter work days per month: 21
Enter holidays: 8
Enter vacation days: 20

SALARIED
Gross Income $ 66,666.67

CONTRACT
Gross Income $117,600.00

Gross Difference $ 50,933.33
- medical insurance $ 10,000.00
- self employment tax $ 17,640.00
  - unpaid holidays $ 4,480.00
  - unpaid vacaation $ 11,200.00

NET DIFFERENCE $ 7,613.33

```

**Problem 2** [30 points] – Create a Java program to solve the annual salary problem from Lab 1. Use the Scanner to prompt for the starting salary and starting raise percent, then use a loop to calculate and print the salary and raise percent for each of 10 years. Also sum up the total annual salaries and print the total income for the decade.

```

Enter starting salary: 30000
Enter starting raise % : 5.1
Year 1 $ 30,000.00 5.10%
Year 2 $ 31,530.00 5.00%
Year 3 $ 33,106.50 4.90%
Year 4 $ 34,728.72 4.80%
Year 5 $ 36,395.70 4.70%
Year 6 $ 38,106.29 4.60%
Year 7 $ 39,859.18 4.50%
Year 8 $ 41,652.85 4.40%
Year 9 $ 43,485.57 4.30%
Year 10 $ 45,355.45 4.20%

Total $374,220.27

```

**Problem 3** [30 points] Create a Java program with a loop that prints a menu of choices, then prompts the user for data needed to calculate the area of the selected shape and prints the area. The menu should repeat until the user selects 0 to exit.

```
Options:
1. Calculate area of a Square
2. Calculate area of a Rectangle
3. Calculate area of a Triangle
4. Calculate area of a Circle
0. EXIT
Enter choice: 1
Enter length of one side: 5
The area is 25
```

```
Options:
1. Calculate area of a Square
2. Calculate area of a Rectangle
3. Calculate area of a Triangle
4. Calculate area of a Circle
0. EXIT
Enter choice: 2
Enter length: 4
Enter width: 7
The area is 28
```

```
Options:
1. Calculate area of a Square
2. Calculate area of a Rectangle
3. Calculate area of a Triangle
4. Calculate area of a Circle
0. EXIT
Enter choice: 3
Enter base: 4
Enter height: 5
The area is 10.00
```

```
Options:
1. Calculate area of a Square
2. Calculate area of a Rectangle
3. Calculate area of a Triangle
4. Calculate area of a Circle
0. EXIT
Enter choice: 4
Enter radius: 5
The area is 78.54
```

```
Options:
1. Calculate area of a Square
2. Calculate area of a Rectangle
3. Calculate area of a Triangle
4. Calculate area of a Circle
0. EXIT
Enter choice: 0
```