**Lab Assignment – 6  
Total Points: 100   
Due Date: 9/28 (Friday), 11.59 pm**

**Objectives:**

* **Learn to use Scanner class to prompt inputs from the user**
* **Learn to use methods of the Math class**
* **Learn to apply formats on numbers using either DecimalFormat or NumberFormat class**

**You would be working on three programming exercises in this lab assignment. All the three programs would be in the same NetBeans Project**

1. Write a program that reads the following information name of the employee, a number of hours worked in a week, hourly pay rate, federal tax withholding rate (e.g., 20%) and state tax withholding rate (e.g., 9%) and calculates the gross income using the following formula:

**Gross Income = hoursWorked \* hourlyPayRate**

Next, calculate the federal and state tax to be withheld and finally calculate the Net Income Tax after deducting the taxes withheld from the Gross Pay.

Finally, your program should a payroll statement that looks like the following:

* + Employee’s name (e.g., Smith)
  + Number of hours worked in a week (e.g., 10)
  + Hourly Pay (e.g., $7.50)
  + Federal tax withholding rate (e.g., 20%)
  + State tax withholding rate (e.g., 9%)
  + Gross Pay (e.g., $75.00)
  + Federal tax withholding (e.g., $5.25)
  + State tax withholding (e.g., $2.50)
  + Net Income (e.g., $67.50)

**Please note you will be using Scanner class to input values from the user.**

**Make sure to describe the class, comment your code appropriately   
(30 points)**

1. Write a program that calculates a monthly mortgage payment; we will assume that the interest rate is compounded monthly. **(40 points)**

**Please note you will be using Scanner class to input values from the user.**

Your program will do the following:

1. Prompt the user for a double representing the annual interest rate.
2. Prompt the user for the number of years the mortgage will be held (typical input here is 10, 15, or 30)
3. Prompt the user for a number representing the mortgage amount borrowed from the bank.
4. Calculate the monthly payment using the following formulas:
   1. Monthly payment = (mIR \* M) / (1 – (1 / (1 + mIR)(12\*nOY) ))  
      where:
   2. mIR = monthly interest rate (annual interest rate / 12)
   3. nOY = number of years
   4. M = mortgage amount
5. Output a summary of the mortgage problem as follows:
   1. The annual interest rate in percent notation
   2. The mortgage amount in dollars
   3. The monthly payment in dollars, with only two significant digits after the decimal point
   4. The total payment over the years, with only two significant digits after the decimal point
   5. The overpayment, i.e. the difference between the total payment over the years and the mortgage amount, with only two significant digits after the decimal point
   6. The overpayment as a percentage (in percent notation) of the mortgage amount

**Run the program for the following inputs:**

* Annual interest rate – 5%, Number of years of mortgage – 30, Mortgage amount – $200,000
* Annual interest rate – 3.5%, Number of years of mortgage – 25, Mortgage amount – $150,000
* Annual interest rate – 4.25%, Number of years of mortgage – 10, Mortgage amount – $100,000

**Make sure to describe the class, comment your code appropriately and also ensure that your print statements are descriptive and verbose.**

1. Write a program that prompts the user for a three-digit integer between 100 and 999 and adds all the digits in the integer. For example, if an integer is 932, the sum of all its digits is 14.  
   *Hint: Use the % operator to extract digits and use the / operator to remove the extracted digit. For instance, 932%10 = 2 and 932/10 = 93.*

**Please note you will be using Scanner class to input values from the user.**

Your program will do the following:

1. Prompt the user for a three-digit int number between 100 – 999.
2. Do the appropriate calculations and store the intermediate values and final values in appropriate variables
3. Print the answer to the output window.

**Run the program for the values: 986, 573**

**(Points 20)**

**Things to Turn in:**

1. In a new Word file and save the file naming convention that we have used for earlier labs. *Use landscape page layout. From here on you will be using landscape page layout for your assignments.*
2. Enter your name at the top of the document.
3. Copy and paste the source code and output of Program – I. Copy and paste the screenshot of the Program – I displaying the output.
4. Copy and paste the source code and output of Program – II for each run of the program. Copy and paste the screenshots of the output window of Program – II for each run of the program for the inputs provided.
5. Copy and paste the source code and output of Program – III for each run of the program. Copy and paste the screenshots of the output window of Program – III for each run of the program for the inputs provided.
6. Select all the text in the Word document and change the font to **“Courier New”.** This is an easy font to read programming code.
7. Zip your NetBeans Project folder.
8. Submit your word document along with the zipped NetBeans project folder using the ***Lab Assignment – 6 links*** on Blackboard by the due date.

**Note: You are allowed only ONE submission in blackboard. Be careful and make sure that you have everything in order while submitting your work. Requests for resetting the submission will not be honored.**