Workshop #1: Foundations of Java language

Learning Outcomes:

Upon successful completion of this workshop, you will have demonstrated the abilities to:

- Practice basic Java language syntax and semantics to write Java programs.
- Use concepts such as variables, conditional and iterative execution methods.
- Compile and run a program.
- Describe to your instructor what you have learned in completing this workshop.

Requirements:

Part1: [3 points]

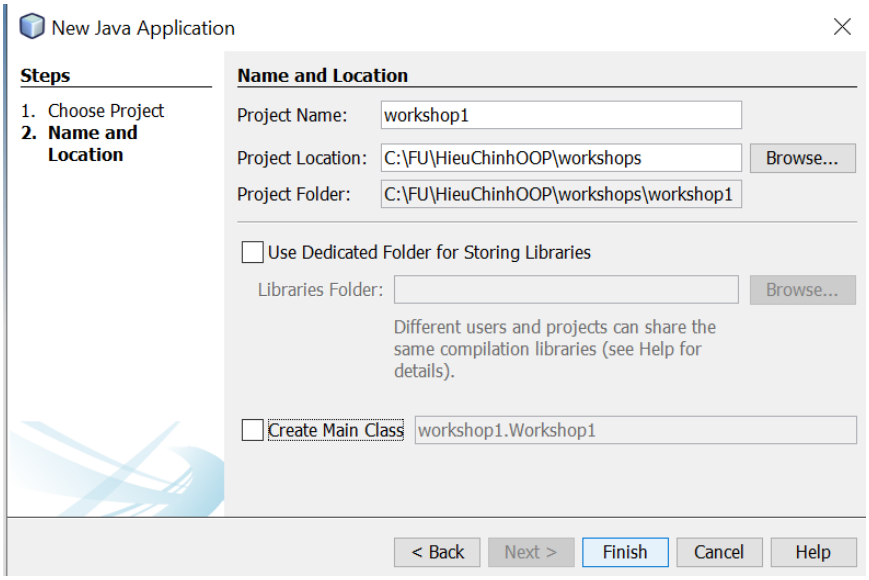
Write a Java program that will accept a matrix of integers then this matrix will be printed out and sum of values and average of values are printed also.

The user interface may be:
Enter number of rows: 2
Enter number of columns: 3
Enter the matrix
m[0][0]=1
m[0][1]=2
m[0][2]=3
m[1][0]=4
m[1][1]=5
m[1][2]=6
Matrix inputted:
1 2 3
4 5 6
Sum: 21
Average: 3.5

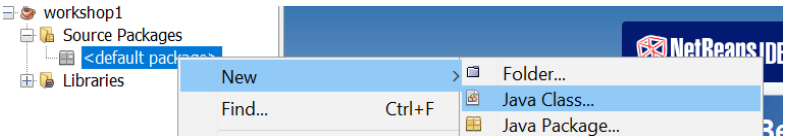
Hint: Use System.out.format("%3d", n);

Step by step workshop instructions:

- Initializing NetBeans and create a new project named “workshop1”



- Create a class named “part1.java”



- In the class “Part1.java”, you type:

  Task 1: input the matrix

```java

import java.util.Scanner;
public class Part1 {
    public static void main(String[] args) {
        int rows;
        int cols;
        int matrix[][];
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter number of rows: ");
        rows=sc.nextInt();
        System.out.println("Enter number of rows: ");
        cols=sc.nextInt();
        matrix=new int[rows][cols];
        System.out.println("Enter the matrix:");
        for(int i=0;i<rows;i++){
            for(int j=0;j<cols;j++){
                System.out.print("\nm["+i+"]["+j+"]=");
                matrix[i][j]=sc.nextInt();
            }
        }
        System.out.println("Matrix inputted:");
        for(int i=0;i<rows;i++){
            for(int j=0;j<cols;j++){
                System.out.format("%3d",matrix[i][j]);
            }
            System.out.println("\n");
        }
    }
}
```

- To run the code, click the right mouse and choose “run file”

Task 2: get sum of values

- You will add the code to “Part1.java”

```java
int sum=0;
for(int i=0;i<rows;i++){
    for(int j=0;j<cols;j++){
        sum=sum+matrix[i][j];
    }
}
System.out.println("Sum:"+ sum);
```

Task 3: get average of values

- You will add the code “System.out.println("Average:" +(float)sum/(rows*cols));” to “Part1.java”

Review criteria

Upon completion of the workshop, your submission will be reviewed based on the following criteria:

- Input the matrix successfully [1 point]

- Get sum [1 point]
- Get average [1 point]

Part 2: [3 points]

Write a Java program that will accept two float numbers and an operator (+-*/) then the program will print out the result of the specified expression that bases on the inputted operator.

The user interface may be:

Input the number 1: 4
Input the number 2: 5
Input the operator: +
the result of 4+5=9

Step by step workshop instructions:

- In the project above, you create a new class named “Part2.java” and add the code:

```
1
2  import java.util.Scanner;
3  public class Part2 {
4      public static void main(String[] args) {
5          float num1,num2;
6          String op;
7          Scanner sc=new Scanner(System.in);
8          System.out.println("Input the number 1:");
9          num1=sc.nextFloat();
10         System.out.println("Input the number 2:");
11         num2=sc.nextFloat();
12         System.out.println("Input the operator(+-*/):");
13         sc=new Scanner(System.in);
14         op=sc.nextLine();
15         if( op.equals("+")){
16             System.out.println("the result of "+num1+ op + num2 + "="+ (num1+num2) );
17         }
18     }
19 }
```

- You must add your code to get the result when user inputs another operator

Part 3 [4 points]

Write a Java program that will accept the list of student name, convert all names to uppercase and then the program will print out the list of student name.

Step by step workshop instructions:

- you create a new class named “Part3.java” and add the code:

```java
public class Part3 {
    public static void main(String[] args) {
        String[] list=new String[10];
        //TODO: input the list of names
        for(int i=0;i<10;i++)
        {
            //Scanner sc=.....
            //list[i]= sc.nextLine();
        }
        //TODO: change the first character of all names to uppercase using toUpperCase();
        //TODO: print out
    }
}
```