PROG1003 & PROG1012

Programming Assignment 2: Elementary Programming

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1. Show the output of the following statements (write a program to verify your result):

   - System.out.println("1" + 1); =11
   - System.out.println('1' + 1); =50
   - System.out.println("1" + 1 + 1); =111
   - System.out.println("1" + (1 + 1)); =12
   - System.out.println('1' + 1 + 1); =51

2. (Computing the volume of a cylinder) Write a program that reads in the radius and length of a cylinder and computes volume using the following formulas:

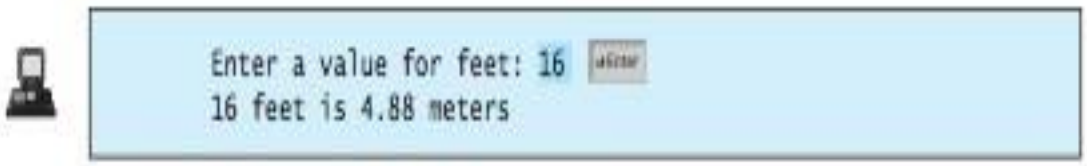
   area = radius * radius * π

   volume = area * length

ANS:

```
import java.util.*;
public class Question2 {
	public static void main(String[] args) {
		Scanner input = new Scanner(System.in);
		System.out.print("Enter the radius and length of a cylinder :");
		double radius = input.nextDouble();
		double length = input.nextDouble();
		double area = radius*radius*3.1415;
		double volume= area*length;
		System.out.println("The area is "+ area);
		System.out.println("The volume is "+ volume);
	}
}
```

3. (Converting feet into meters) Write a program that reads a number in feet, converts it to meters, and displays the result. One foot is 0.305 meter. Here is a sample run:



ANS:

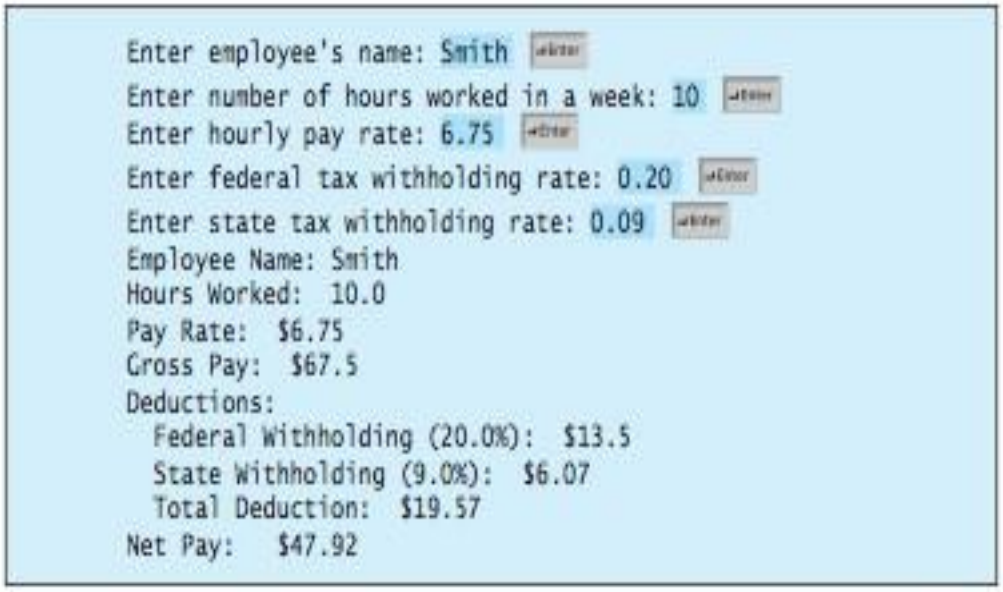
```
import java.util.*;

public class Question3 {

	public static void main(String[] args) {

		 Scanner input=new Scanner(System.in);
		System.out.print("Enter a value for feet:");
		double feet = input.nextDouble();
		double meters = feet*0.305;
		System.out.print(feet+" feet is " +meters+ "meters");
	}

}
```

4. (*Financial application: payroll*) Write a program that reads the following information and prints a payroll statement:

   Employee's name (e.g., Smith)
   Number of hours worked in a week (e.g., 10)
   Hourly pay rate (e.g., 6.75)
   Federal tax withholding rate (e.g., 20%)
   State tax withholding rate (e.g., 9%)

   Write this program in two versions:

   (a) Use dialog boxes to obtain input and display output;
   (b) Use console input and output. A sample run of the console input and output is shown below:



ANS:

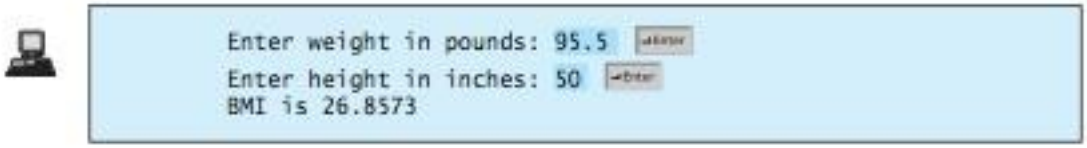
(a) Use dialog boxes to obtain input and display output

```
package javaapplication8;

import javax.swing.JOptionPane;

public class JavaApplication8 {

public static void main(String[] args) {

String name= JOptionPane.showInputDialog(null,"Enter employee's name","Financial
application: payroll",JOptionPane.INFORMATION_MESSAGE);

String HoursWork = JOptionPane.showInputDialog(null,"Enter number of hours work in a
week","Financial application: payroll",JOptionPane.INFORMATION_MESSAGE);

String PayRate = JOptionPane.showInputDialog(null,"Enter hourly pay rate","Financial
application: payroll",JOptionPane.INFORMATION_MESSAGE);

String FederalTax = JOptionPane.showInputDialog(null,"Enter federal tax withholding
rate","Financial application: payroll",JOptionPane.INFORMATION_MESSAGE);

String StateTax = JOptionPane.showInputDialog(null,"Enter state tax withholding
rate","Financial application: payroll",JOptionPane.INFORMATION_MESSAGE);

      double GrossPay =  Double.parseDouble(HoursWork)* Double.parseDouble(PayRate);
      double Federa = GrossPay*Double.parseDouble(FederalTax);
      double State = GrossPay*Double.parseDouble(StateTax);
      double Deuction = Federa+State;
      double NetPay = GrossPay-Deuction;

JOptionPane.showMessageDialog(null, "Employee name: "+name+"\nHours Worked:
"+HoursWork+"\nPay Rate: "+"$"+PayRate+"\nGross Pay
"+"$"+GrossPay+"(n)Deuctions:"+"\n   Federa Withholding (20%): "+"$"+Federa+"\n   State
Withholding (9.0%): "+"$"+State+"\n   Total Deuction: "+"$"+Deuction+"\nNet Pay:
"+"$"+NetPay,"Financial application: payroll",JOptionPane.INFORMATION_MESSAGE);
        }
}
```

(b) Use console input and output. A sample run of the console input and output is shown below:

```
package javaapplication8;
import java.util.*;

public class JavaApplication8 {

    public static void main(String[] args) {
        Scanner input=new Scanner(System.in);
        System.out.print("Enter employee's name: ");
        String name= input.next();
        System.out.print("Enter number of hours work in a week: ");
        double HoursWork = input.nextDouble();
        System.out.print("Enter hourly pay rate: ");
        double PayRate = input.nextDouble();
        System.out.print("Enter federal tax withholding rate: ");
        double FederalTax = input.nextDouble();
        System.out.print("Enter state tax withholding rate: ");
        double StateTax = input.nextDouble();
        double GrossPay = HoursWork*PayRate;
        double Federa = GrossPay*FederalTax;
        double State = GrossPay*StateTax;
        double Deuction = Federa+State;
        double NetPay = GrossPay-Deuction;
        System.out.println("Employee name:\t"+name);
        System.out.println("Hours Worked\t:"+HoursWork);
        System.out.println("Pay Rate:\t"+"$"+PayRate);
        System.out.println("Gross Pay\t"+"$"+GrossPay);
        System.out.println("Deuctions:");
        System.out.println("\tFedera Withholding (20%):\t"+"$"+Federa);
        System.out.println("\tState Withholding (9.0%):\t"+"$"+State);
        System.out.println("\tTotal Deuction:\t"+"$"+Deuction);
        System.out.println("Net Pay:\t"+"$"+NetPay);
    }

}
```

5. *(Health application: computing BMI)* Body Mass Index (BMI) is a measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by the square of your height in meters. Write a program that prompts the user to enter a weight in pounds and height in inches and display the BMI. Note that one pound is **0.45359237** kilograms and one inch is **0.0254** meters. Here is a sample run:



ANS:

package question5;

```
import java.util.*;

public class Question5 {

  public static void main(String[] args) {
      // TODO code application logic here
      Scanner input=new Scanner(System.in);
      System.out.print("Enter weight in pounds: ");
      double pounds = input.nextDouble();
      System.out.print("Enter height in inches: ");
      double inches = input.nextDouble();
      double kilograms = pounds*0.45359237;
      double meters = inches*0.0254;
      double BMI = kilograms/(meters*meters);
      System.out.print("BMI is "+BMI);

    }

}
```