

PROG1003 & PROG1012

Programming Assignment 2: Elementary Programming

Name:

Student No:

1. Show the output of the following statements (write a program to verify your result):
 - `System.out.println("1" + 1);`
 - `System.out.println('1' + 1);`
 - `System.out.println("1" + 1 + 1);`
 - `System.out.println("1" + (1 + 1));`
 - `System.out.println('1' + 1 + 1);`
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:

$$\text{area} = \text{radius} * \text{radius} * \pi$$

$$\text{volume} = \text{area} * \text{length}$$



```
Enter the radius and length of a cylinder: 5.5 12
The area is 95.0331
The volume is 1140.4
```


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:



```
Enter a value for feet: 16
16 feet is 4.88 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:



```
Enter employee's name: Smith
Enter number of hours worked in a week: 10
Enter hourly pay rate: 6.75
Enter federal tax withholding rate: 0.20
Enter state tax withholding rate: 0.09
Employee Name: Smith
Hours Worked: 10.0
Pay Rate: $6.75
Gross Pay: $67.5
Deductions:
    Federal Withholding (20.0%): $13.5
    State Withholding (9.0%): $6.07
    Total Deduction: $19.57
Net Pay: $47.92
```

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:



```
Enter weight in pounds: 95.5
Enter height in inches: 50
BMI is 26.8573
```