**Object-Oriented Programming**

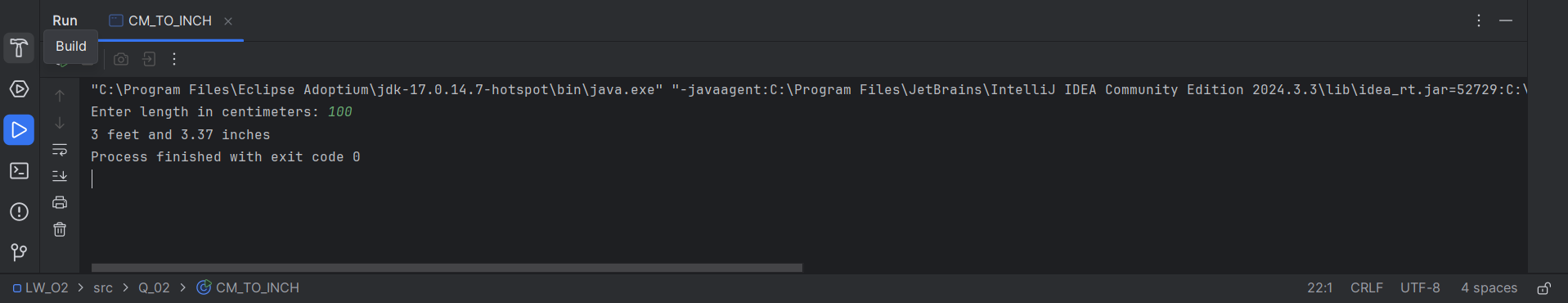
**CTEC 22043**

**Lab worksheet 2:Numerical Data**

CT/2021/016

**1. Write Java expressions to compute each of the following.**  
a)  
double squareroot = Math.*sqrt*(Math.*pow*(B, 2) + 4 \* A \* C);  
  
  
b)  
double result= Math.*sqrt*(X + 4 \* Math.*pow*(Y, 3));  
  
  
c)  
double cuberoot = Math.*pow*(X \* Y, 1.0 / 3);  
  
  
d)  
double radius;  
double area = Math.*PI* \* Math.*pow*(radius, 2);

**2. Write a program to convert centimeters (input) to feet and inches (output).**import java.util.Scanner;  
  
public class CM\_TO\_INCH {  
 public static void main(String[] args) {  
 Scanner scanner = new Scanner(System.*in*);  
  
 System.*out*.print("Enter length in centimeters: ");  
 double cm = scanner.nextDouble();  
  
 double totalInches = cm / 2.54;  
  
 int feet = (int) (totalInches / 12);  
 double inches = totalInches % 12;  
  
 System.*out*.printf("%d feet and %.2f inches",feet,inches);  
  
 scanner.close();  
 }  
}



**3. Write a program that inputs temperature in degrees Celsius and prints out the temperature in degrees Fahrenheit. The formula to convert degrees Celsius to equivalent degrees Fahrenheit is,**

import java.util.Scanner;  
public class Fahrenheit {  
  
 public static void main (String[] arg){  
 Scanner x =new Scanner(System.*in*);  
  
 System.*out*.print("Enter the temperature in celsius:");  
 double cel = x.nextDouble();  
  
 double far = (1.8 \* cel) + 32;  
  
 System.*out*.printf("%.2f degrees Celsius is equal to %.2f degrees Fahrenheit", cel, far);  
  
 x.close();  
 }  
  
  
}

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**4. Write a program that accepts a person's weight and displays the number of calories the person needs in one day. A person needs 19 calories per pound of body weight,**

import java.util.Scanner;  
public class Weight {  
 public static void main(String[] args){  
  
 Scanner y = new Scanner(System.*in*);  
  
 System.*out*.print("Enter weight in pound:");  
 double weight= y.nextDouble();  
  
 double calories = weight \* 19;  
  
 System.*out*.print("you need " + String.*format*("%.0f", calories) + " calories per day");  
  
 y.close();  
 }  
}

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**5. Write a program that inputs temperature in degrees Fahrenheit and prints out the temperature in degrees Celsius. The formula to convert degrees Fahrenheit to equivalent degrees Celsius is,**  
import java.util.Scanner;  
  
public class Celsius {  
 public static void main(String[] args){  
  
 Scanner x = new Scanner(System.*in*);  
  
 System.*out*.print("Enter the temperature in degrees Fahrenhite:");  
 double temp= x.nextDouble();  
  
 double cel=(5.0/9) \* (temp-32);  
  
 System.*out*.print(String.*format*("%.2f",temp ) + " Fahrenhite is equal to " + String.*format*("%.2f", cel) + " Celsius");  
  
 x.close();  
 }  
}

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**6. Write a program that inputs the year a person is born and outputs the age of the person in the following format:**  
  
import java.util.Calendar;  
import java.util.Scanner;  
  
public class age {  
 public static void main(String[] args) {  
 Scanner x = new Scanner(System.*in*);  
  
 System.*out*.print("Enter the year you were born: ");  
 int birthYear = x.nextInt();  
  
 int currentYear = Calendar.*getInstance*().get(Calendar.*YEAR*);  
 int age = currentYear - birthYear;  
  
 System.*out*.println("You were born in " + birthYear + " and will be (are) " + Math.*abs*(age) + " this year.");  
  
 x.close();  
 }  
}

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**7. A quantity known as the body mass index (BMI) is used to calculate the risk of weight-related health problems. BMI is computed by the formula,**

import java.util.Scanner;  
  
 public class bmi {  
 public static void main(String[] args) {  
 Scanner x= new Scanner(System.*in*);  
  
 System.*out*.print("Enter your weight in kilograms: ");  
 double weight = x.nextDouble();  
  
 System.*out*.print("Enter your height in centimeters: ");  
 double height = x.nextDouble();  
  
 double bmi = weight / Math.*pow*(height / 100.0, 2);  
  
 System.*out*.printf("Your BMI is: %.2f%n", bmi);  
  
 if (bmi < 18.5) {  
 System.*out*.println("You are underweight.");  
 } else if (bmi >= 18.5 && bmi <= 25) {  
 System.*out*.println("You have a normal weight.");  
 } else {  
 System.*out*.println("You are overweight.");  
 }  
  
 x.close();  
 }  
 }

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**8.The volume of a sphere is computed by the equation,**

**V = (4/3)**  **x (PI x r3)**

**where V is the volume, Pl is the Pi value (3.14) and r is the radius of the sphere. Write a program that computes the volume of a sphere with a given radius r.**

import java.util.Scanner;  
  
public class vloume{  
 public static void main(String[] args) {  
 Scanner x = new Scanner(System.*in*);  
  
 System.*out*.print("Enter the radius of the sphere: ");  
 double radius = x.nextDouble();  
  
 double volume = (4.0 / 3) \* Math.*PI* \* Math.*pow*(radius, 3);  
  
 System.*out*.printf("The volume of the sphere is: %.2f%n", volume);  
  
 x.close();  
 }  
}

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**9. If you invest P dollars at R percent interest rate compounded annually, in N years ,your investment will grow to P(1 + (R /100))N dollars. Write an application that accepts P, R, and N and computes the amount of money earned after N years.**

import java.util.Scanner;  
  
public class money {  
 public static void main(String[] args) {  
 Scanner x = new Scanner(System.*in*);  
  
 System.*out*.print("Enter the amount : ");  
 double p = x.nextDouble();  
  
 System.*out*.print("Enter the interest rate in percentage: ");  
 double rate = x.nextDouble();  
  
 double rateDecimal = rate / 100;  
  
 System.*out*.print("Enter the number of years : ");  
 int years = x.nextInt();  
  
 double futureValue = p \* Math.*pow*(1 + rate, years);  
  
 System.*out*.printf("The future value of your investment after %d years is: %.2f%n", years, futureValue);  
  
 x.close();  
 }  
}

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**10. Write a loan calculator program that computes both monthly and total payments for the given inputs loan amount, annual interest rate, and loan period.**

import java.util.Scanner;  
  
public class calculator {  
 public static void main(String[] args) {  
 Scanner x = new Scanner(System.*in*);  
  
 final int MONTHS\_IN\_YEAR = 12;  
  
 System.*out*.print("Enter the loan amount: ");  
 double loanAmount = x.nextDouble();  
  
 System.*out*.print("Enter the annual interest rate (in percentage): ");  
 double annualInterestRate =x.nextDouble();  
  
 System.*out*.print("Enter the loan period (in years): ");  
 int loanPeriod = x.nextInt();  
  
 double monthlyInterestRate = annualInterestRate / 100 / MONTHS\_IN\_YEAR;  
  
 int numberOfPayments = loanPeriod \* MONTHS\_IN\_YEAR;  
  
 double monthlyPayment = (loanAmount \* monthlyInterestRate) /  
 (1 - Math.*pow*(1 / (1 + monthlyInterestRate), numberOfPayments));  
  
 double totalPayment = monthlyPayment \* numberOfPayments;  
  
 System.*out*.printf("Monthly Payment: %.2f%n", monthlyPayment);  
 System.*out*.printf("Total Payment: %.2f%n", totalPayment);  
  
 x.close();  
 }  
}

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