**2.1** (*Convert Celsius to Fahrenheit*) Write a program that reads a Celsius degree in

a **double** value from the console, then converts it to Fahrenheit and displays the result.

**import** java.util.Scanner;  
  
**public class** CelsiusToFahrenheit {  
 **public** CelsiusToFahrenheit() {  
 }  
  
 **public static void** main(String[] args) {  
 Scanner input = **new** Scanner(System.in);  
 System.out.print(**"Enter a degree in Celsius: "**);  
 **double** celsius = input.nextDouble();  
 **double** fahrenheit = 1.8D \* celsius + 32.0D;  
 System.out.println(**"Celsius "** + celsius + **" is "** + fahrenheit + **" in Fahrenheit."**);  
 }  
}

**2.2** (*Compute the volume of a cylinder*) Write a program that reads in the radius

and length of a cylinder and computes the area and volume.

**import** java.util.Scanner;  
  
**public class** ComputeAreaAndVolumeOfCylinder {  
 **public static void** main(String[] args){  
 Scanner input = **new** Scanner(System.***in***);  
  
 System.***out***.print(**"Enter a number for radius:"**);  
 **double** radius = input.nextDouble();  
 System.***out***.print(**"Enter a number for length:"**);  
 **double** length = input.nextDouble();  
 **final double** PIE = 3.14159;  
  
 **double** area = radius \* radius \* PIE;  
 **double** volume = area \* length;  
 System.***out***.println(**"The area is "** + (Math.*round*(area \* 10000) / 10000.0));  
 System.***out***.println(**"The volume is "** + (Math.*round*(volume \* 10) / 10.0));  
 }  
}

**\*\*2.6** (*Sum the digits in an integer*) Write a program that reads an integer between **0** and

**1000** and adds all the digits in the integer. For example, if an integer is **932**, the

sum of all its digits is **14**.

**import** java.util.Scanner;  
  
**public class** SumTheDigits {  
 **public static void** main(String[] args){  
 Scanner input = **new** Scanner(System.***in***);  
  
 System.***out***.println(**"Enter a number between 0 and 1000"**);  
 **int** number01 = input.nextInt();  
  
 **int** n1 = number01 % 10;  
 **int** number02 = number01 / 10;  
 **int** n2 = number02 % 10;  
 **int** n3 = number02 / 10;  
 System.***out***.print(**"The sum of the digits is "** + (n1 + n2 + n3));  
 }  
}

**\*2.8** (*Current time*) Listing 2.7, ShowCurrentTime.java, gives a program that displays

the current time in GMT. Revise the program so that it prompts the user to enter

the time zone offset to GMT and displays the time in the specified time zone.

**import** java.util.Scanner;  
  
**public class** ShowCurrentTimeInSpecificTimeZone {  
 **public static void** main(String[] args){  
 Scanner input = **new** Scanner(System.***in***);  
  
 System.***out***.print(**"Enter the time zone offset to GMT:"**);  
 **long** timeZone = input.nextLong();  
 **long** totalMilliseconds = System.*currentTimeMillis*();  
 **long** totalSeconds = totalMilliseconds / 1000;  
 **long** currentSecond = totalSeconds % 60;  
 **long** totalMinutes = totalSeconds / 60;  
 **long** currentMinute = totalMinutes % 60;  
 **long** totalHours = totalMinutes / 60;  
 **long** currentHour = totalHours % 24;  
 **long** Hour = currentHour + timeZone;  
 System.***out***.println(**"The current time is "** + Hour + **":"** + currentMinute + **":"** + currentSecond);  
 }  
}

**\*2.14** (*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 displays the BMI. Note

that one pound is **0.45359237** kilograms and one inch is **0.0254** meters.

**import** java.util.Scanner;  
**public class** ComputeBMI {  
 **public static void** main(String[] args){  
 Scanner input = **new** Scanner(System.***in***);  
  
 System.***out***.print(**"Enter weight in pounds:"**);  
 **double** weightInPounds = input.nextDouble();  
 System.***out***.print(**"Enter height in inches:"**);  
 **double** heightInInches = input.nextDouble();  
 **double** weightInKilograms = weightInPounds\*0.45359237;  
 **double** heightInMeters = heightInInches\*0.0254;  
 **double** BMI = weightInKilograms/(Math.*pow*(heightInMeters,2));  
 System.***out***.println(**"BMI is "**+(Math.*round*(BMI \* 10000) / 10000.0));  
 }  
}

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**\*2.19** (*Geometry: area of a triangle*) Write a program that prompts the user to enter three points **(x1, y1)**, **(x2, y2)**, **(x3, y3)** of a triangle and displays its area.

**import** java.util.Scanner;  
**public class** ComputeAreaOfTriangle {  
 **public static** Double GetLength(**double**[] point\_a,**double**[] point\_b){  
 **return** Math.*sqrt*(Math.*pow*(point\_a[0] - point\_b[0],2) + Math.*pow*(point\_a[1] - point\_b[1],2));  
 }  
 **public static void** main(String[] args){  
 Scanner input = **new** Scanner(System.***in***);  
 System.***out***.println(**"Enter three points for a triangle(x1 y1 x2 y2 x3 y3):"**);  
 **double** x1 = input.nextDouble();  
 **double** y1 = input.nextDouble();  
 **double** x2 = input.nextDouble();  
 **double** y2 = input.nextDouble();  
 **double** x3 = input.nextDouble();  
 **double** y3 = input.nextDouble();  
 **double** side1 = *GetLength*(**new double**[]{x1,y1},**new double**[]{x2,y2});  
 **double** side2 = *GetLength*(**new double**[]{x1,y1},**new double**[]{x3,y3});  
 **double** side3 = *GetLength*(**new double**[]{x2,y2},**new double**[]{x3,y3});  
 **double** s = (side1 + side2 + side3) / 2.0;  
 **double** area = Math.*sqrt*(s \* (s - side1) \* (s - side2) \* (s - side3));  
 System.***out***.println(**"The area of the triangle is: "** + Math.*round*(area \* 10) / 10.0);  
 }  
}

**\*2.21** (*Financial application: calculate future investment value*) Write a program that

reads in investment amount, annual interest rate, and number of years, and displays

the future investment value.

**import** java.util.Scanner;  
**public class** ComputeFutureInvestmentValue {  
 **public static void** main(String[] args){  
 Scanner input = **new** Scanner(System.***in***);  
 System.***out***.print(**"Enter investment amount:"**);  
 **double** investmentAmount = input.nextDouble();  
 System.***out***.print(**"Enter annual interest rate in percentage:"**);  
 **double** monthlyInterestRate = ((input.nextDouble()) / 100.0) / 12;  
 System.***out***.print(**"Enter number of years:"**);  
 **int** numberOfYears = input.nextInt();  
  
 **double** accumulatedValue = investmentAmount \* Math.*pow*(1 + monthlyInterestRate , numberOfYears \* 12);  
 System.***out***.print(**"Accumulated value is \u0024"** + Math.*round*(accumulatedValue \* 100) / 100.0);  
 }  
}

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