CSC103 Programming Fundamentals Elementary Programming

BSSE IIA

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# LAB TASKS

1. Make a program that generates random numbers from 0 to 1000. Use class java.util.Random or java.util.Math for random number generation.

package com.company;  
import java.util.Random;  
public class task1 {  
 public static void main(String[] args) {  
 *// Method1* int min=0;  
 int max=1000;  
 double rand = Math.*random*() \* (max - min + 1) + min;  
 rand = (int)rand;  
 System.*out*.println("generated random number is " + rand);  
 *// Method2* Random Rand = new Random();  
 int upperbound = 1001;  
 *//generate random values from 0-24* int int\_random = Rand.nextInt(upperbound);  
 System.*out*.println("Random integer value from 0 to" + (upperbound-1) + " : "+ int\_random);  
 }  
}

1. Calculate area of circle. Input radius from user. Define PI (3.14) as constant in your program. Display your answer in console.

package com.company;  
import java.util.Scanner;  
  
public class task2 {  
 public static void main(String[] args) {  
 Scanner input = new Scanner(System.*in*);  
 System.*out*.println("Enter radius: ");  
 int radius = input.nextInt();  
 final float pi = 3.14f;  
 float Area = pi \* (radius \* radius);  
 System.*out*.println("Area is:" + Area);  
 }  
}

1. Do above task but display your answer in a dialog box.

package com.company;  
import java.util.Scanner;  
import javax.swing.\*;  
  
public class task3 {  
 public static void main(String[] args) {  
 JFrame f;  
 f = new JFrame();  
 Scanner input = new Scanner(System.*in*);  
 final float pi = 3.14f;  
 int radius = Integer.*parseInt*(JOptionPane.*showInputDialog*(f,"Enter radius"));  
 float Area = pi \* (radius \* radius);  
 JOptionPane.*showMessageDialog*(f,"Area is " + Area);  
 }  
}

1. Write a program that uses all methods for Scanner objects (listed in Table 2.1 of your book). Display the values on screen.

package com.company;  
import java.util.Scanner;  
public class task4 {  
 public static void main(String[] args) {  
 Scanner input = new Scanner(System.*in*);  
 System.*out*.println("Enter your Name: ");  
 String name = input.nextLine();  
 System.*out*.println("Enter your age: ");  
 byte age = input.nextByte();  
 System.*out*.println("Enter your Height: ");  
 float height = input.nextFloat();  
 System.*out*.println("Name: " +name+ " Age: " +age+ " Height " +height);  
 }  
}

1. Input three fractional numbers. Calculate their average. Display result in a dialog box.

package com.company;  
import javax.swing.\*;  
import java.util.Scanner;  
  
public class task5 {  
 public static void main(String[] args){  
 JFrame f;  
 f = new JFrame();  
 Scanner sc = new Scanner(System.*in*);  
 int num1 = Integer.*parseInt*(JOptionPane.*showInputDialog*(f,"Enter numerator for first fraction : "));  
 int den1 = Integer.*parseInt*(JOptionPane.*showInputDialog*(f,"Enter denominator for first fraction : "));  
 int num2 = Integer.*parseInt*(JOptionPane.*showInputDialog*(f,"Enter numerator for 2nd fraction : "));  
 int den2 =Integer.*parseInt*(JOptionPane.*showInputDialog*(f,"Enter denominator for 2nd fraction : "));  
 int num3 = Integer.*parseInt*(JOptionPane.*showInputDialog*(f,"Enter numerator for 3rd fraction : "));  
 int den3 = Integer.*parseInt*(JOptionPane.*showInputDialog*(f,"Enter denominator for 3rd fraction : "));  
 float r = (num1/den1 + num1/den2 + num3/den3) / 3 ;  
  
 JOptionPane.*showMessageDialog*( f , "(" +num1+"/"+den1+ ")+("+num2+"/"+den2+") + (" + num3 + "/" +den3+ ") = " + r);  
  
 }  
}

1. Input three whole numbers (integers). Calculate their average. Your result should be a decimal value.

package com.company;  
import java.util.Scanner;  
public class task6 {  
 public static void main(String[] args)  
 {  
  
 Scanner in = new Scanner(System.*in*);  
 System.*out*.print("Input the first number: ");  
 double x = in.nextDouble();  
 System.*out*.print("Input the second number: ");  
 double y = in.nextDouble();  
 System.*out*.print("Input the third number: ");  
 double z = in.nextDouble();  
 System.*out*.print("The average value is " + (x + y + z) / 3 +"\n" );  
 }  
}

1. Input two numbers. Perform all arithmetic operations on them. Display results.

import java.util.Scanner;

public class task7 {

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

System.out.print("Input first number: ");

int num1 = in.nextInt();

System.out.print("Input second number: ");

int num2 = in.nextInt();

System.out.println(num1 + " + " + num2 + " = " +

(num1 + num2));

System.out.println(num1 + " - " + num2 + " = " +

(num1 - num2));

System.out.println(num1 + " x " + num2 + " = " +

(num1 \* num2));

System.out.println(num1 + " / " + num2 + " = " +

(num1 / num2));

System.out.println(num1 + " mod " + num2 + " = " +

(num1 % num2));

}

}

1. Input number of seconds. Convert them into:
   * Minutes
   * Hours
   * Days
   * Months
   * Years

package com.company;  
import java.util.Scanner;  
public class task8 {  
 public static void main(String[] args){  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.println("Enter seconds:- ");  
 int n = sc.nextInt();  
 int day = n / (24 \* 3600);  
  
 n = n % (24 \* 3600);  
 System.*out*.println(n);  
 int hour = n / 3600;  
  
 n %= 3600;  
 int minutes = n / 60 ;  
  
 n %= 60;  
 int seconds = n;  
  
 System.*out*.println( day + "days " +hour+ "hours " + minutes  
 + "minutes " + seconds + "seconds " );  
 }  
}

1. Input number of years. Convert them into:
   * Months
   * Days
   * Hours
   * Minutes
   * Seconds

package com.company;  
  
import java.util.Scanner;  
  
public class task9 {  
 public static void main(String[] args){  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.println("Enter Years ");  
 int n = sc.nextInt();  
 int year =n ;  
 int month = n\*12;  
 int Numberofdays = ((year%400==0) || (year%4==0 && year%100!=0)) ? 366:365 ;  
 Numberofdays \*= n;  
 int NumberofHours = n \* 365 \* 24 ;  
 int NumberofMinutes =n \* 365\* 24 \* 3600 ;  
 int NumberofSeconds = n \* 24 \*365\* 3600 \* 3600 ;  
  
 System.*out*.println(month+" monts "+Numberofdays + "days " +NumberofHours+ "hours "+  
 NumberofMinutes+ "minutes " + NumberofSeconds + "seconds " );  
 }  
}

1. Input a five-digit whole number from user. Calculate sum of its digits. Display the result.

package com.company;  
import java.util.Scanner;  
  
public class task11 {  
 public static void main(String[] args){  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.println("Enter 5 digit number");  
 int n = sc.nextInt();  
 int r1 = n % 10;  
 n = n / 10;  
 int r2 = n % 10;  
 n = n / 10;  
 int r3 = n % 10;  
 n = n / 10;  
 int r4 = n % 10;  
 n = n / 10;  
 int r5 = n % 10;  
 System.*out*.println("Sum is " + (r1+r2+r3+r4+r5));  
  
 }  
  
}

1. Input a five-digit amount of money. Determine different number of notes required for that amount.
2. package com.company;  
   import java.util.Scanner;  
   public class task12 {  
    public static void main(String[] args){  
    Scanner sc = new Scanner(System.*in*);  
    System.*out*.println("Enter currency " +  
    "1,5,10,20,50,100,500,1000 and 5000 these notes are available");  
    int cur = sc.nextInt();  
    int turn = 1;  
     
    if (cur>=5000){  
    turn = cur / 5000;  
    cur = cur - (turn\*5000); System.*out*.println(turn+" note: 5000 ");  
    if (cur>=1000){  
    turn = cur / 1000;  
    cur = cur - (turn\*1000); System.*out*.println(turn+" note: 1000 ");}  
    if(cur >= 500){  
    turn = cur / 500;  
    cur = cur - (turn\*500); System.*out*.println(turn+ " note: 500");}  
    if (cur>=100){  
    cur = cur - 100; System.*out*.println(turn+ " note: 100 ");}  
    if (cur>=50){  
    turn = cur / 50;  
    cur = cur - (turn\*50); System.*out*.println(turn+" note: 50 ");}  
    if (cur>=20){  
    turn = cur / 20;  
    cur = cur - (turn\*20); System.*out*.println(turn+" note: 20 ");}  
    if (cur>=10){  
    turn = cur / 10;  
    cur = cur - (turn\*10); System.*out*.println(turn+" note: 10 ");}  
    if (cur>=5){  
    turn = cur / 5;  
    cur = cur - (turn\*5);  
    System.*out*.println(turn + " note: 5 ");}  
    }  
    else  
    System.*out*.println("INVALIDITY OCCUR CHECK YOU VALUE");  
    }  
   }
3. Explore Math class in Java. Use its various functions (such as min(), max(), avg(), sin(), cos(), round(), etc.) in your program.

package com.company;  
import java.util.Scanner;  
  
public class task6 {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 int x,y;  
 System.*out*.println("\n Press 1 to find MAX number " +  
 "\n press 2 to find min number" +  
 "\n press 3 to find Sqrt of Number" +  
 "\n press 4 to find power of number" +  
 "\n press 5 to find log of number" +  
 "\n press 6 to find log10 " +  
 " \n press 7 to find exponential" +  
 "\n press 8 to find sin of angle" +  
 "\n press 9 to find cos of angle " +  
 "\n press 10 to find tan of angle" +  
 "\n Enter choice:- ");  
 int choice = sc.nextInt();  
  
 switch (choice) {  
 case 1 -> {  
 System.*out*.println("Enter 1st value:- ");  
 x = sc.nextInt();  
 System.*out*.println("Enter 2nd value:- ");  
 y = sc.nextInt();  
 System.*out*.println("Max value from " + x + "and " + y + "is " + Math.*max*(x, y));  
 }  
 case 2 -> {  
 System.*out*.println("Enter 1st value:- ");  
 x = sc.nextInt();  
 System.*out*.println("Enter 2nd value:- ");  
 y = sc.nextInt();  
 System.*out*.println("Max value from " + x + "and " + y + "is " + Math.*min*(x, y));  
 }  
 case 3 -> {  
 System.*out*.println("Enter value:- ");  
 int value = sc.nextInt();  
 System.*out*.println("SQRT OF " + value + " is " + Math.*sqrt*(value));  
 }  
 case 4 -> {  
 System.*out*.println("Enter n(n^p) value:- ");  
 x = sc.nextInt();  
 System.*out*.println("Enter p(n^p) value:- ");  
 y = sc.nextInt();  
 System.*out*.println("Power of " + x + "^" + y + " is " + Math.*pow*(x, y));  
 }  
 case 5 -> {  
 System.*out*.println("Enter value:- ");  
 x = sc.nextInt();  
 System.*out*.println("Log of " + x + " is " + Math.*log*(x));  
 }  
 case 6 -> {  
 System.*out*.println("Enter value:- ");  
 x = sc.nextInt();  
 System.*out*.println("Log of " + x + " is " + Math.*log10*(x));  
 }  
 case 7 -> {  
 System.*out*.println("Enter value to find exponentiotion:- ");  
 x = sc.nextInt();  
 System.*out*.println("Exponention of " + x + " is " + Math.*exp*(x));  
 }  
 case 8 -> {  
 System.*out*.println("Enter value to find sin:- ");  
 x = sc.nextInt();  
 System.*out*.println("tan of " + x + " is " + Math.*tan*(x));  
 }  
 case 9 -> {  
 System.*out*.println("Enter value to find cos:- ");  
 x = sc.nextInt();  
 System.*out*.println("cos of " + x + " is " + Math.*tan*(x));  
 }  
 case 10 -> {  
 System.*out*.println("Enter value to find tan of angle:- ");  
 x = sc.nextInt();  
 System.*out*.println("Tan of " + x + " is " + Math.*tan*(x));  
 }  
 default -> System.*out*.println("INVALID INPUT");  
 }  
 }  
}

1. Find difference between two time periods (a time period is hours:minutes:seconds).

package com.company;  
import java.util.Scanner;  
public class task7 {  
 public static void main(String[] args){  
 Scanner sc = new Scanner(System.*in*);  
 int h1 = sc.nextInt();  
 int h2 = sc.nextInt();  
 int m1 = sc.nextInt();  
 int m2 = sc.nextInt();  
 int s1 = sc.nextInt();  
 int s2 = sc.nextInt();  
 int h = h1 - h2;  
 int m = m1 - m2;  
 int s = s1 - s2;  
 if (m1-m2 < 0)  
 {  
 h--;  
 m = 60 - m;  
  
 }  
 if (s1-s2 < 0) {  
 m--;  
 s = 60 - s;  
 }  
 System.*out*.println(h1+ ":" + m1+":" + s1 + " - " + h1+ ":" + m1+":" + s1 + " is " + h+ ":" + m+":" + s);  
 }  
}

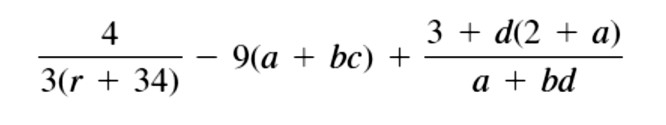
1. Write a program that would determine the name of 100th day if today is Thursday.

package com.company;  
import java.util.Scanner;  
public class task14 {  
 public static void main(String[] args)  
 {  
  
 Scanner in = new Scanner(System.*in*);  
 System.*out*.print("0 Mon" +  
 " 1Tue 2wed 3thurs 4fri 5sat 6sun Enter Current day: ");  
 int n = in.nextInt();  
 System.*out*.println( " Enter number of day lapse:- ");  
 int d = in.nextInt();  
 String day="" ,Day="";  
  
  
 if (n==0)  
 day = "Monday";  
 else if(n==1)  
 day = "tuesday";  
 else if(n==2)  
 day = "wednesday";  
 else if(n==3)  
 day = "thursday";  
 else if(n==4)  
 day = "friday";  
 else if(n==5)  
 day = "saturday";  
 else if(n==6)  
 day = "sunday";  
 else  
 System.*out*.println();  
  
 int dl = (d +1 ) % 7;  
 if (dl==0)  
 Day = "Monday";  
 else if(dl==1)  
 Day = "tuesday";  
 else if(dl==2)  
 Day = "wednesday";  
 else if(dl==3)  
 Day = "thursday";  
 else if(dl==4)  
 Day = "friday";  
 else if(dl==5)  
 Day = "saturday";  
 else if(dl==6)  
 Day = "sunday";  
 else  
 System.*out*.println();  
  
 System.*out*.println(" Current day is "+ day +  
 " The day after " + d + " days is " + Day);  
 }  
}

1. Make a program the takes in temperature value in Fahrenheit and converts into Celsius value.
2. Redo the above task, but convert Celsius value into Fahrenheit.
3. Write a program to solve the given expression:

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package com.company;  
  
import java.util.Scanner;  
  
public class task17 {  
 public static void main(String[] args){  
 Scanner in = new Scanner(System.*in*);  
 System.*out*.println("Enter a,b,c,d,r : ");  
 int a = in.nextInt();  
 int b = in.nextInt();  
 int c = in.nextInt();  
 int d = in.nextInt();  
 int r = in.nextInt();  
 float result = 4/ (3\*(r + 34)) - 9 \*(a + b\*c) + (3 + d\* ( 2+ a)/(a + b \* d));  
 System.*out*.println("Result is " + result);  
  
 }  
}

1. You can use System.currentTimeMillis() to know the number of milliseconds in current time. Use this value to obtain current second, minute, and hour. Please refer to page 51 of the book for help.

package com.company;  
public class task18 {  
 public static void main(String[] args) {  
 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;  
  
 System.*out*.println("Current time is " + currentHour + ":"  
 + currentMinute + ":" + currentSecond + " GMT");  
 }  
 }

1. Take 2 integers (let’s say num1 and num2) from user. Take another two values (e.g. ival, dval). Increment num1 by ival and decrement num2 by dval, by using increment and decrement operators respectively. Your program should show the difference between the use of
   * Preincrement and postincrement
   * Predecrement and postdecrement (Table 2.5, page 54).

Display your answers.

package com.company;  
  
import java.util.Scanner;  
import java.util.\*;  
  
  
public class Main {  
 public static void main(String args[]) {  
 Scanner scan = new Scanner(System.*in*);  
 System.*out*.println("Enter num1 and num2");  
 int num1 = scan.nextInt();  
 int num2 = scan.nextInt();  
 int ival=0 , dval=0;  
 num1 += ival++;  
 System.*out*.println(" Post increment " + num1 );  
 num1 += ival--;  
 System.*out*.println(" post decrement " + num1 );  
 num2 += --ival;  
 System.*out*.println(" pre decrement " + num1 );  
 num2 += ival++;  
 System.*out*.println(" post increment " + num1 );  
 }  
}

1. Read section 2.18 and 2.19 from your text book. Do the examples and exercise questions.

|  |  |
| --- | --- |
| 2.18 | public static void main(String[] args) { |
|  | float a, b; |
|  | System.out.println("a b pow(a, b)"); |
|  | a = 1; |
|  | b = 2; |
|  | System.out.println((int)a + " " + (int)b + |
|  | " " + (int)Math.pow(a, b)); |
|  | a++; |
|  | b++; |
|  | System.out.println((int)a + " " + (int)b + |
|  | " " + (int)Math.pow(a, b)); |
|  | a++; |
|  | b++; |
|  | System.out.println((int)a + " " + (int)b + |
|  | " " + (int)Math.pow(a, b)); |
|  | a++; |
|  | b++; |
|  | System.out.println((int)a + " " + (int)b + |
|  | " " + (int)Math.pow(a, b)); |
|  | a++; |
|  | b++; |
|  | System.out.println((int)a + " " + (int)b + |
|  | " " + (int)Math.pow(a, b));} |
|  |  |
|  |  |

|  |
| --- |
| 2.19 **task21B{** |
|  | public static void main(String[] args) { |
|  | Scanner input = new Scanner(System.in); |
|  |  |
|  | // Prompt the user to enter three points |
|  | System.out.print("Enter three points for a triangle: "); |
|  | double x1 = input.nextDouble(); |
|  | double y1 = input.nextDouble(); |
|  | double x2 = input.nextDouble(); |
|  | double y2 = input.nextDouble(); |
|  | double x3 = input.nextDouble(); |
|  | double y3 = input.nextDouble(); |
|  |  |
|  | // Compute the area of a triangle |
|  | double side1 = Math.pow(Math.pow(x2 - x1, 2) + Math.pow(y2 - y1, 2), 0.5); |
|  | double side2 = Math.pow(Math.pow(x3 - x2, 2) + Math.pow(y3 - y2, 2), 0.5); |
|  | double side3 = Math.pow(Math.pow(x1 - x3, 2) + Math.pow(y1 - y3, 2), 0.5); |
|  | double s = (side1 + side2 + side3) / 2; |
|  | double area = Math.pow(s \* (s - side1) \* (s - side2) \* (s - side3), 0.5); |
|  |  |
|  | // Display result |
|  | System.out.println("The area of the triangle is " + area); |
|  | } |
|  | } |

1. Explore String class in Java. Test its various functions by using them in small programs.