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| File:COMSATS new logo.jpg - Wikimedia Commons  Programming Fundamentals  Class Assignment 2 + Lab assignment 2 | **submitted by:**  **Shahzaneer Ahmed**  **registration number:**  **sp21-bcs-087**  **submitted to:**  **Mr. rizwan rashid**  **date of submission:**  **november 14, 2021** |

# Class assignment

Question 1:

Source Code:

//------------------------------------------------------------

//----------------Shahzaneer Ahmed----------------------------

//////////////////SP21-BCS-087--------------------------------

//--------------CLASS Assignment 02---------------------------

//------------------------------------------------------------

//Question – 1: \_\_\_\_\_\_

// Write a program that prompts the user to enter a Social Security number in the format DDD-DDDDDD, where D is a digit. Your program should check whether the input is valid. Here are

// sample runs:

// Enter a SSN: 232-23-5435

// 232-23-5435 is a valid social security number

// Enter a SSN: 23-23-5435

// 23-23-5435 is an invalid social security number

import java.util.Scanner;

public class Question1 {

public static void main(String[] args) {

Scanner input = new Scanner(System.in);

System.out.println("Enter SSN in the format DDD-DD-DDDD");

String ssn = input.nextLine();

String a = ssn.substring(0,(ssn.indexOf('-')));

String b = ssn.substring((ssn.indexOf('-')+1),(ssn.lastIndexOf('-')));

String c = ssn.substring((ssn.lastIndexOf('-')+1),(ssn.length()));

String d = a+b+c;

try {

int number = Integer.parseInt(d);

if (a.length() == 3 && b.length() == 2 && c.length() == 4)

System.out.printf("The %s is a valid social security number!", ssn);

else

System.out.printf("The %s is an invalid social security number!",ssn);

}

catch (NumberFormatException e){

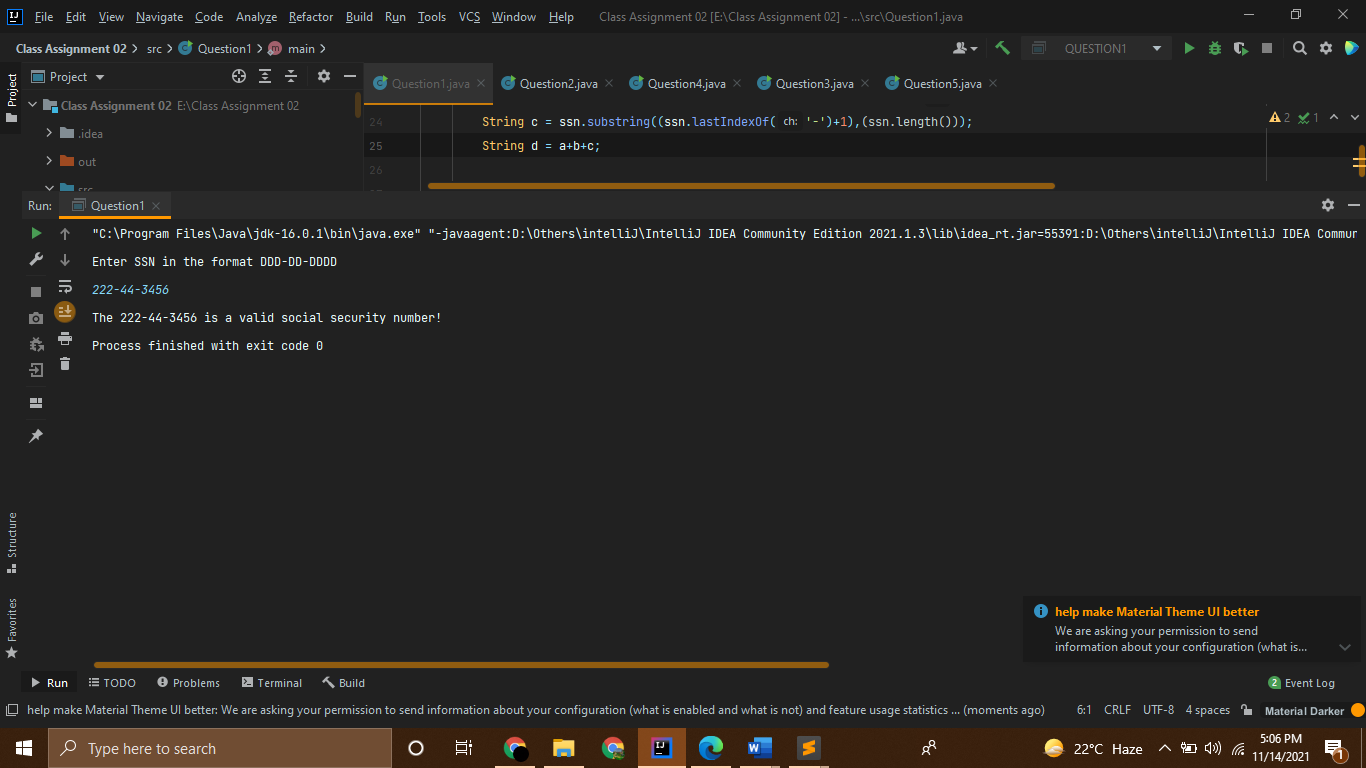
System.out.printf("The %s is an invalid social security number! please enter Numbers only!",ssn);

}

}

}

Screenshot:



Question 2:

Source Code:

//------------------------------------------------------------

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//--------------CLASS Assignment 02---------------------------

//------------------------------------------------------------

//Question – 2: \_\_\_\_\_\_

// Write a program that prompts the user to enter two strings and reports whether the second string

// is a substring of the first string

// Enter string s1: ABCD

// Enter string s2: BC

// BC is a substring of ABCD

import java.util.Scanner;

public class Question2 {

public static void main(String[] args) {

Scanner input = new Scanner(System.in);

System.out.println("Enter String 1");

String s1 = input.nextLine();

System.out.println("Enter String 2");

String s2 = input.nextLine();

boolean a = s1.contains(s2);

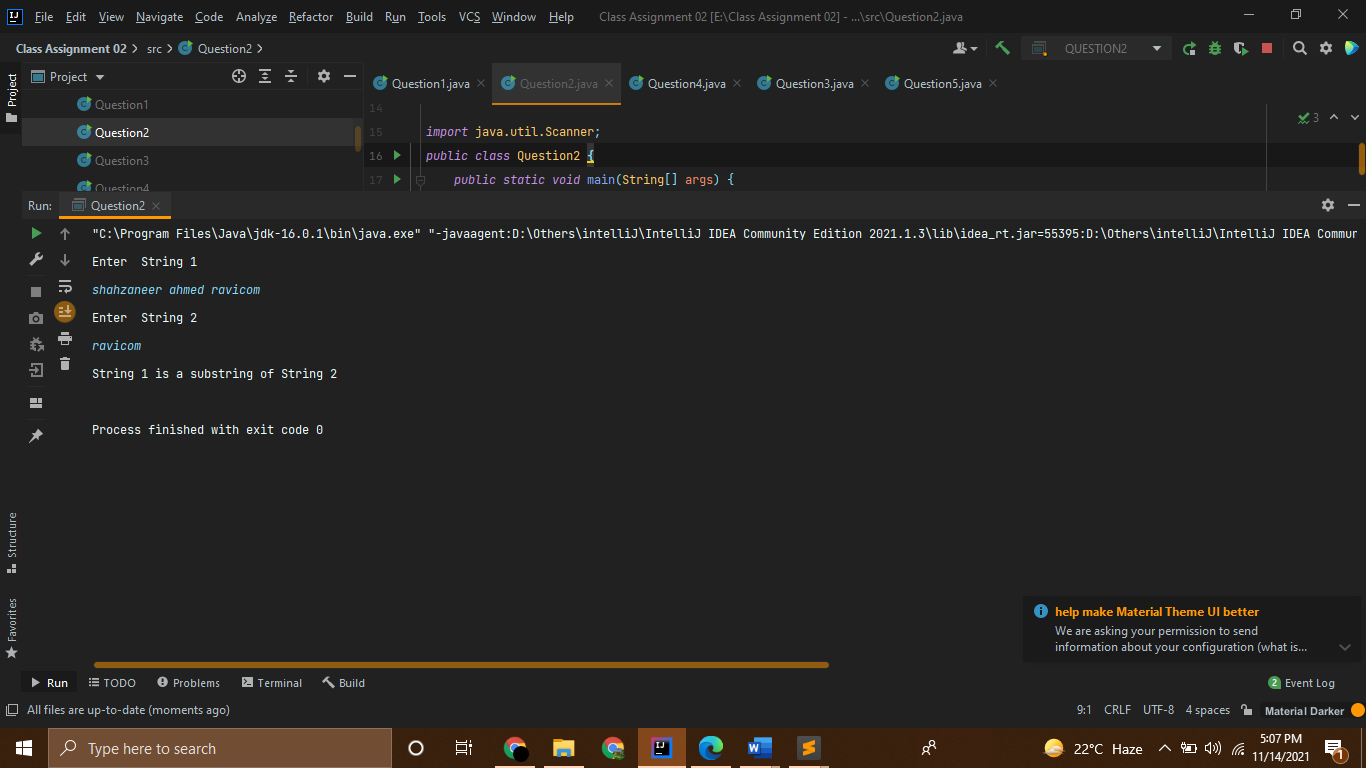
if (a) System.out.println("String 1 is a substring of String 2");

else System.out.println("The String 1 is not a substring of String 2");

}

}

Screenshot:



Question 3:

Source Code:

//------------------------------------------------------------

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//------------------------------------------------------------

//Question – 3: \_\_\_\_\_\_

// Assume a vehicle plate number consists of three uppercase letters followed by four digits. Write a

// program to generate a plate number.

import java.util.Random;

public class Question3 {

public static void main(String[] args) {

Random rand = new Random();

int numbers = 1000 + rand.nextInt(1000);

// System.out.println(numbers);

String alphabets = "QWERTYUIOPASDFGHJKLZXCVBNM";

String upperCaseLetters = "";

for (int i = 0; i<3;i++) {

int randomIndex = rand.nextInt(alphabets.length());

char randomChar = alphabets.charAt(randomIndex);

upperCaseLetters += randomChar;

}

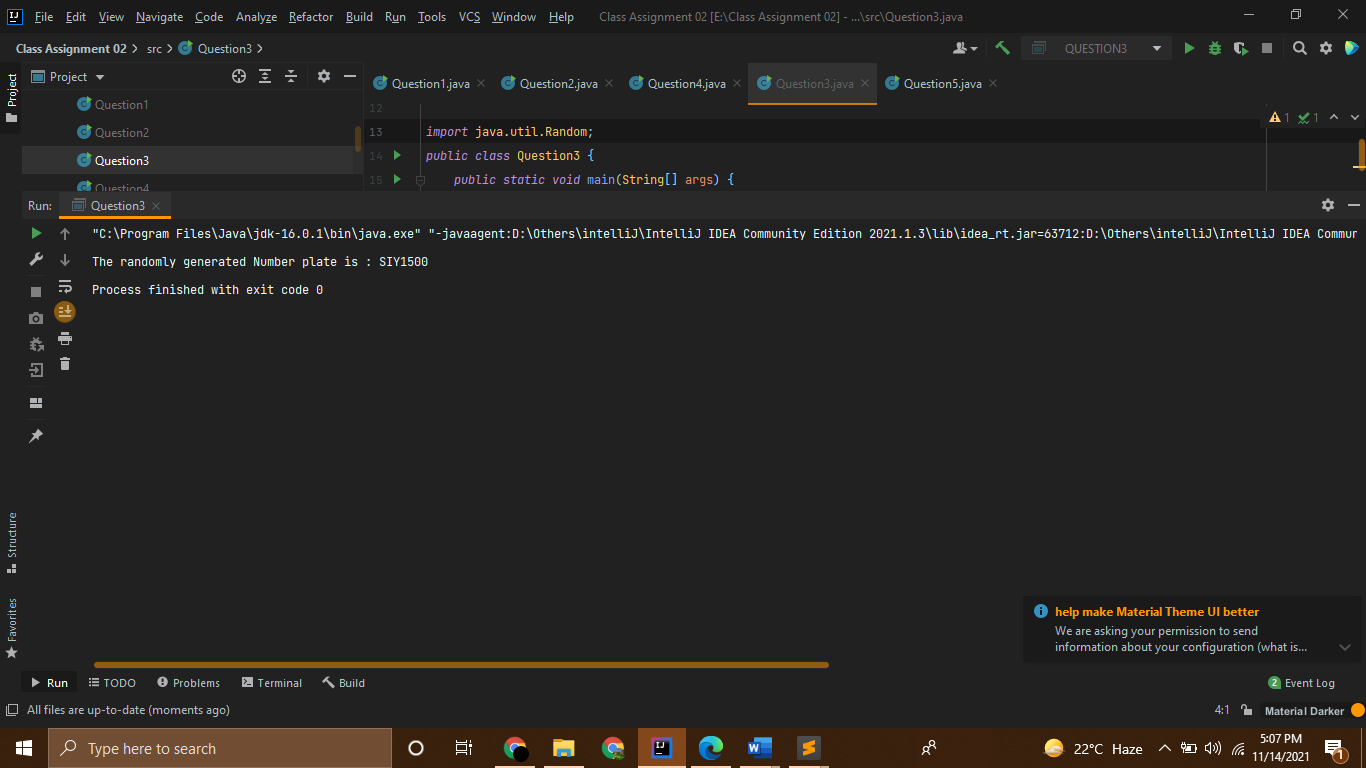
// System.out.println(upperCaseLetters);

System.out.printf("The randomly generated Number plate is : %s%d",upperCaseLetters,numbers);

}

}

Screenshot:



Question 4:

Source Code:

//------------------------------------------------------------

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//--------------CLASS Assignment 02---------------------------

//------------------------------------------------------------

//Question – 4: \_\_\_\_\_\_

// Write a program that displays all the leap years, ten per line, from 101 to 2100, separated by

// exactly one space. Also display the number of leap years in this period

public class Question4 {

public static void main(String[] args) {

int count = 0;

for (int i=101; i<=2100;i++){

//Condition for LEap year

if ((i%4==0) && (i%400==0 || i%100!= 0)){

System.out.print(i+ " ");

count= count + 1;

//Printing new line after 10 leap years

if (count%10==0){

System.out.printf("\n");

}

}

}

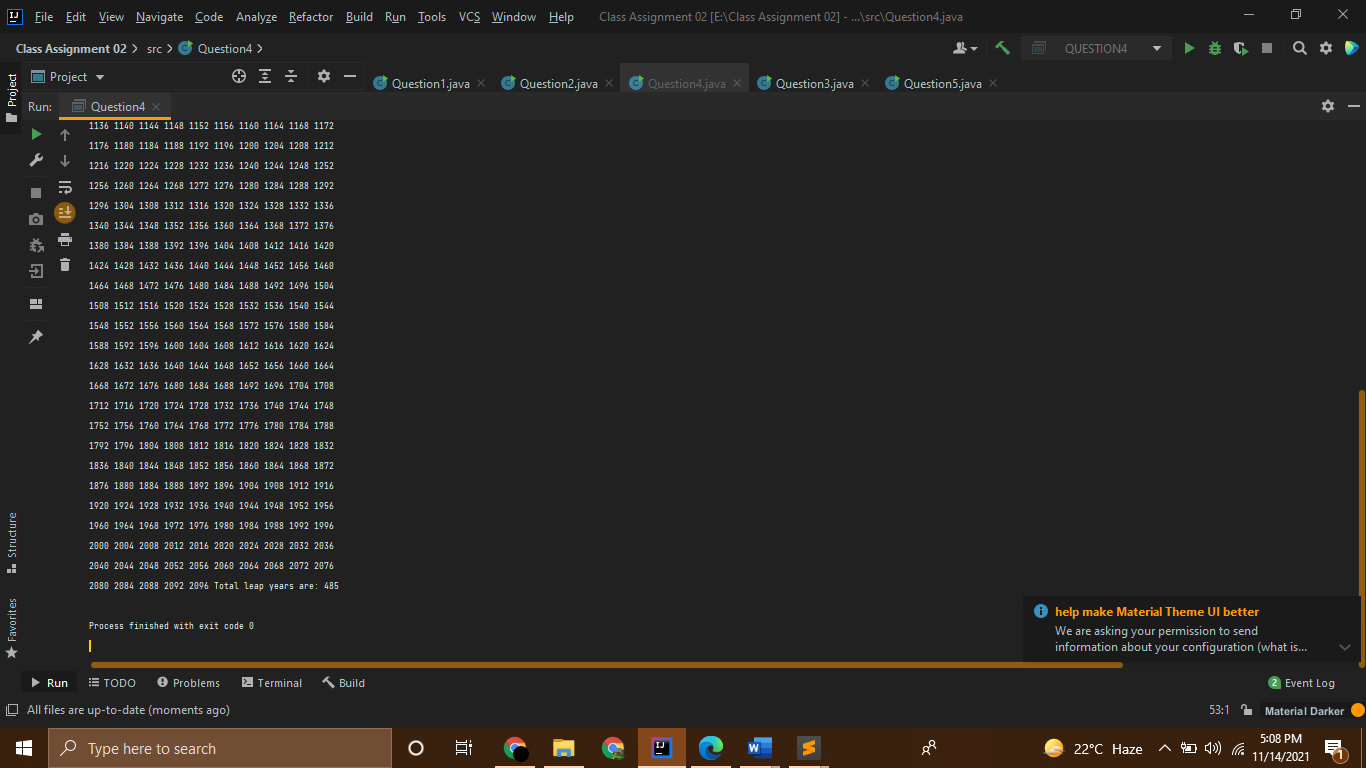
//Displying total number of leap years

System.out.println("Total leap years are: " + count);

}

}

Screenshot:



Question 5:

Source Code:

//------------------------------------------------------------

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//--------------CLASS Assignment 02---------------------------

//------------------------------------------------------------

//Question – 5: \_\_\_\_\_\_

// Write a program that prompts the user to enter a decimal integer and displays its corresponding

// binary value. Don’t use Java’s Integer.toBinaryString(int) in this program

import java.util.Scanner;

public class Question5 {

public static void main(String[] args) {

Scanner input = new Scanner(System.in);

System.out.println("Enter your decimal value :");

int decimal = input.nextInt();

int num = decimal;

String value = "";

while (num!=0){

int rem = num%2;

value+=rem;

num = num/2;

}

String binary = "";

for (int i = value.length()-1; i>=0;i--){

binary+=value.charAt(i);

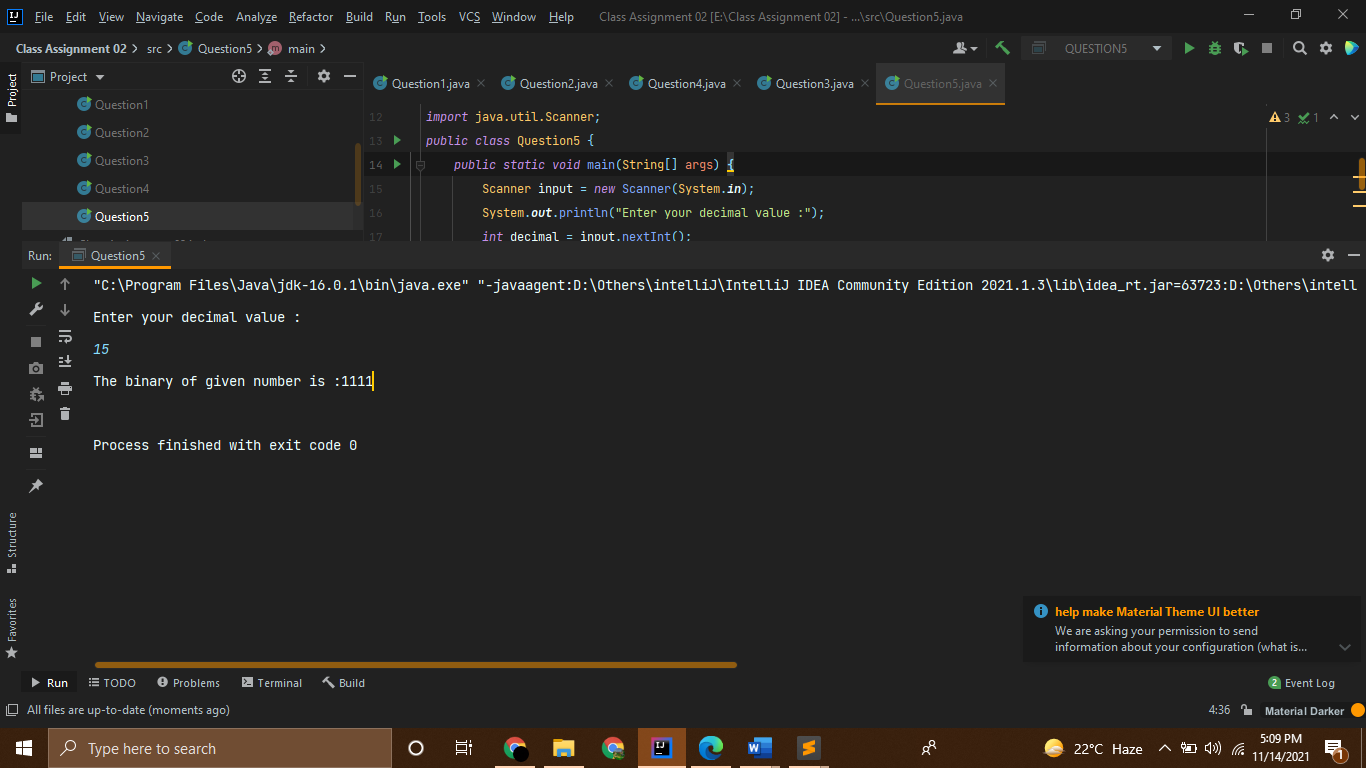
}

System.out.println("The binary of given number is :"+binary);

}

}

Screenshot:



# Lab assignment

Question 1:

Source Code:

//------------------------------------------------------------

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//----------------Lab Assignment 02---------------------------

//------------------------------------------------------------

//Write a nested for loop that prints the following output:

public class Question1 {

public static void main(String[] args) {

int n = 4;

for (int rows = 0; rows<2\*n;rows++){

int spaces = 2\*n -rows+1;

for (int space=1; space<=spaces; space++){

System.out.print(" ");

}

for (int columns = 1; columns<=rows+1; columns++){

//

// System.out.print((int) Math.pow(2,columns-1)+" ");

System.out.printf("%2d ",(int) Math.pow(2,columns-1));

}

for (int columns = rows; columns>0;columns--){

//

// System.out.print((int) Math.pow(2,columns-1)+" ");

System.out.printf("%2d ",(int) Math.pow(2,columns-1));

}

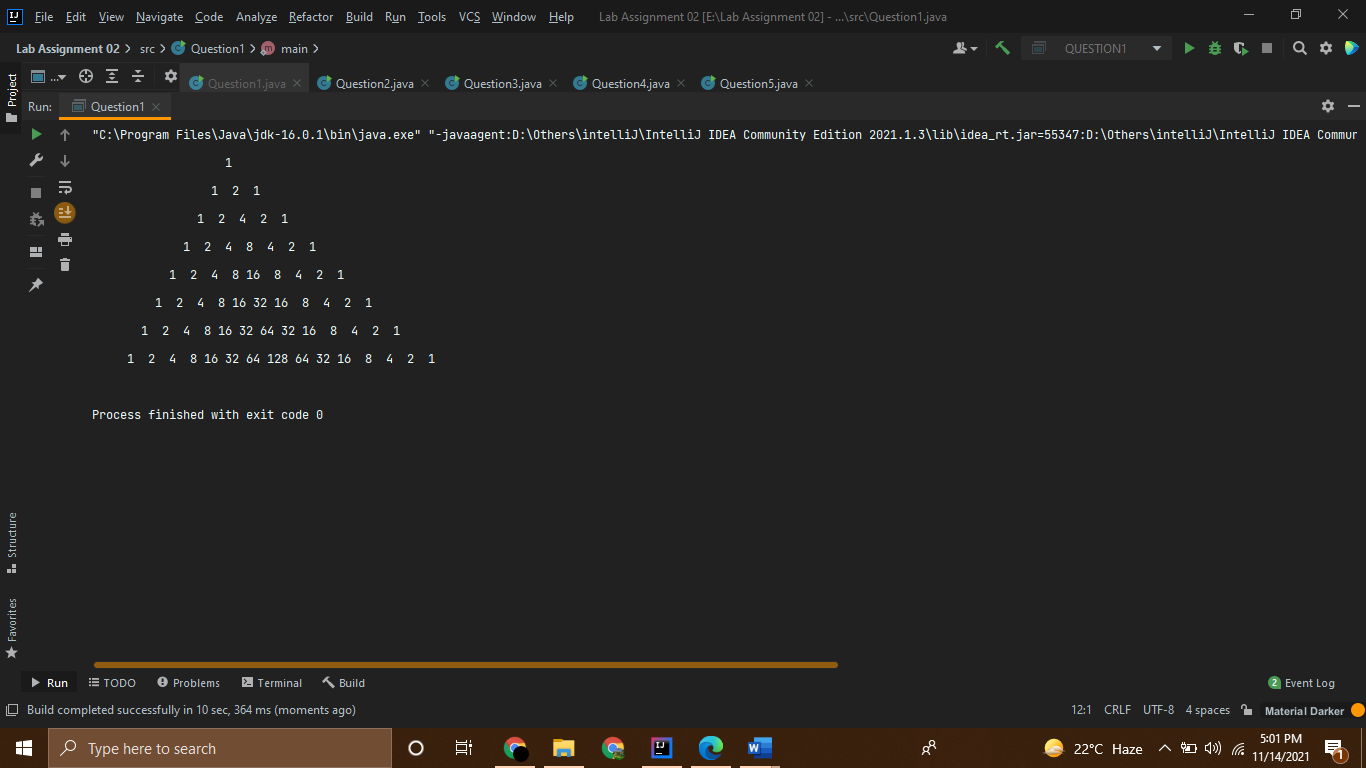
System.out.println();

}

}

}

Screenshot:



Question 2:

Source Code:

//------------------------------------------------------------

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//////////////////SP21-BCS-087--------------------------------

//----------------Lab Assignment 02---------------------------

//------------------------------------------------------------

//Question – 2: \_\_\_\_\_\_

// Write a program that prompts the user to enter the year and first day of the year, and displays the first

// day of each month in the year. For example, if the user entered the year 2013, and 2 for Tuesday,

// January 1, 2013, your program should display the following output:

// January 1, 2013 is Tuesday

// ...

// December 1, 2013 is Sunday

import java.util.Scanner;

public class Question2 {

public static void main(String[] args){

Scanner input = new Scanner(System.in);

// Prompt the user to enter input

System.out.print("Enter a year: ");

int year = input.nextInt();

System.out.print("Enter the first day of the year: ");

int firstDay = input.nextInt();

int numberOfDaysInMonth = 0;

String firstDayString = "";

// Display calendar for each month

for (int month = 1; month <= 12; month++) {

// Display Calendar title

switch (month) {

case 1: System.out.print("January 1, " + year + " is ");

numberOfDaysInMonth = 31;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 2: System.out.print("February 1, " + year + " is ");

if (year % 400 == 0 || (year % 4 == 0 && year % 100 != 0))

numberOfDaysInMonth = 29;

else

numberOfDaysInMonth = 28;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 3: System.out.print("March 1, " + year + " is ");

numberOfDaysInMonth = 31;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 4: System.out.print("April 1, " + year + " is ");

numberOfDaysInMonth = 30;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 5: System.out.print("May 1, " + year + " is ");

numberOfDaysInMonth = 31;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 6: System.out.print("June 1, " + year + " is ");

numberOfDaysInMonth = 30;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 7: System.out.print("July 1, " + year + " is ");

numberOfDaysInMonth = 31;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 8: System.out.print("August 1, " + year + " is ");

numberOfDaysInMonth = 31;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 9: System.out.print("September 1, " + year + " is ");

numberOfDaysInMonth = 30;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 10: System.out.print("October 1, " + year + " is ");

numberOfDaysInMonth = 31;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 11: System.out.print("November 1, " + year + " is ");

numberOfDaysInMonth = 30;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

case 12: System.out.print("December 1, " + year + " is ");

numberOfDaysInMonth = 31;

firstDayString = firstDay(firstDay);

System.out.println(firstDayString);

break;

}

// Get the start day for the next month

firstDay = (firstDay + numberOfDaysInMonth) % 7;

}

}

public static String firstDay(int firstDay) {

String firstDayString = "";

switch (firstDay) {

case 0: firstDayString = "Sunday"; break;

case 1: firstDayString = "Monday"; break;

case 2: firstDayString = "Tuesday"; break;

case 3: firstDayString = "Wednesday"; break;

case 4: firstDayString = "Thursday"; break;

case 5: firstDayString = "Friday"; break;

case 6: firstDayString = "Saturday"; break;

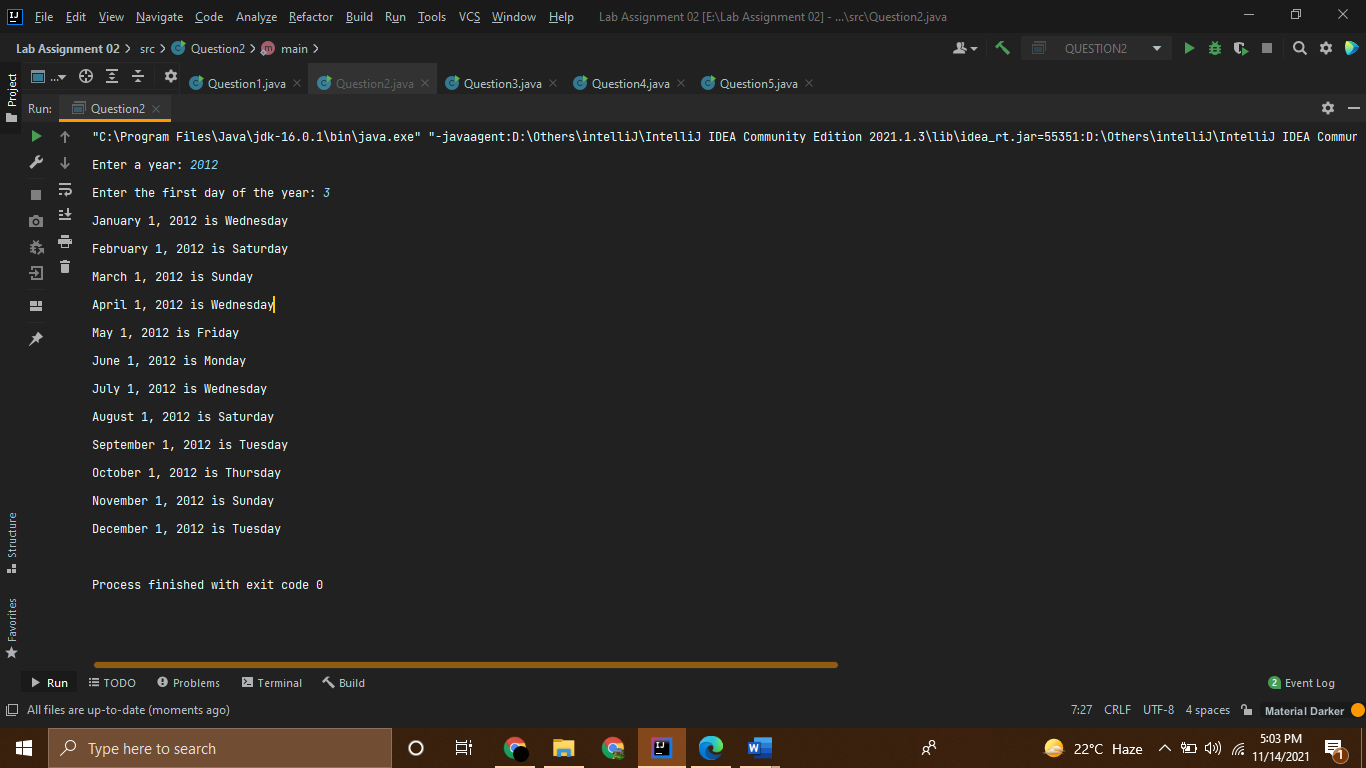
}

return firstDayString;

}

}

Screenshot:



Question 3:

Source Code:

//------------------------------------------------------------

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//////////////////SP21-BCS-087--------------------------------

//----------------Lab Assignment 02---------------------------

//------------------------------------------------------------

import java.util.Scanner;

public class Question3 {

public static void main(String...args){

Scanner sc = new Scanner(System.in);

System.out.print("Enter a word: ");

String str = sc.nextLine();

System.out.print(capatalize(str));

}

public static String capatalize(String lower\_case\_word){

String firstLetStr = lower\_case\_word.substring(0, 1);

String remLetStr = lower\_case\_word.substring(1);

firstLetStr = firstLetStr.toUpperCase();

String firstLetterCapitalizedName = firstLetStr + remLetStr;

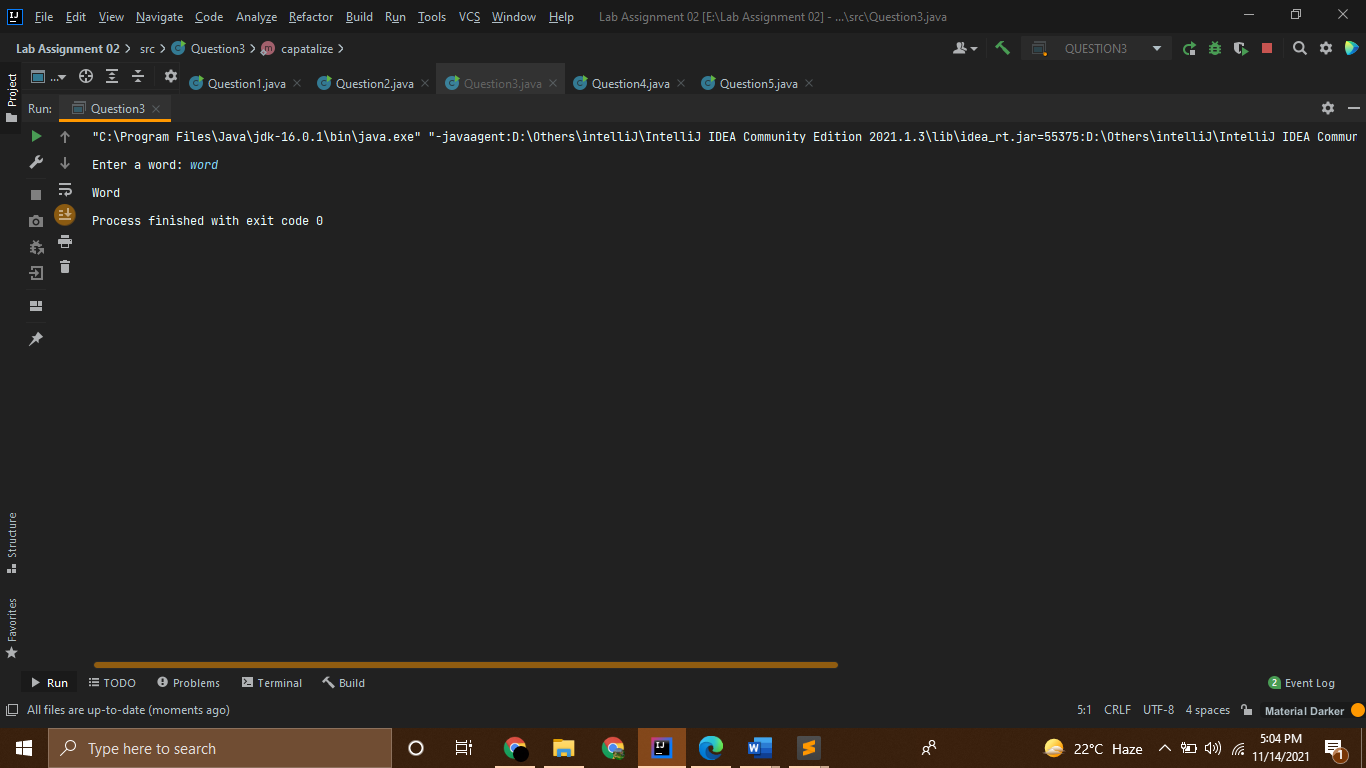
String c = (firstLetterCapitalizedName);

return c;

}

}

Screenshot:



Question 4:

Source Code:

//------------------------------------------------------------

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//////////////////SP21-BCS-087--------------------------------

//----------------Lab Assignment 02---------------------------

//------------------------------------------------------------

//Question – 4: \_\_\_\_\_\_

// Write a method that displays an n-by-n matrix using the following header: public static void

// printMatrix(int n)

// Each element is 0 or 1, which is generated randomly. Write a test program that prompts the user to

// enter n and displays an n-by-n matrix. Here is a sample run:

// Enter n: 3

// 0 1 0

// 0 0 0

// 1 1 1

import java.util.Scanner;

import java.util.Random;

public class Question4 {

public static void main(String[] args) {

Scanner input = new Scanner(System.in);

System.out.println("Enter the (n) the order of matrix :");

int order = input.nextInt();

printMatrix(order);

}

public static void printMatrix(int n){

Random rand = new Random();

for (int i = 0; i<n; i++){

for (int j = 0; j<n; j++){

int value = rand.nextInt(2);

System.out.print(value+" ");

}

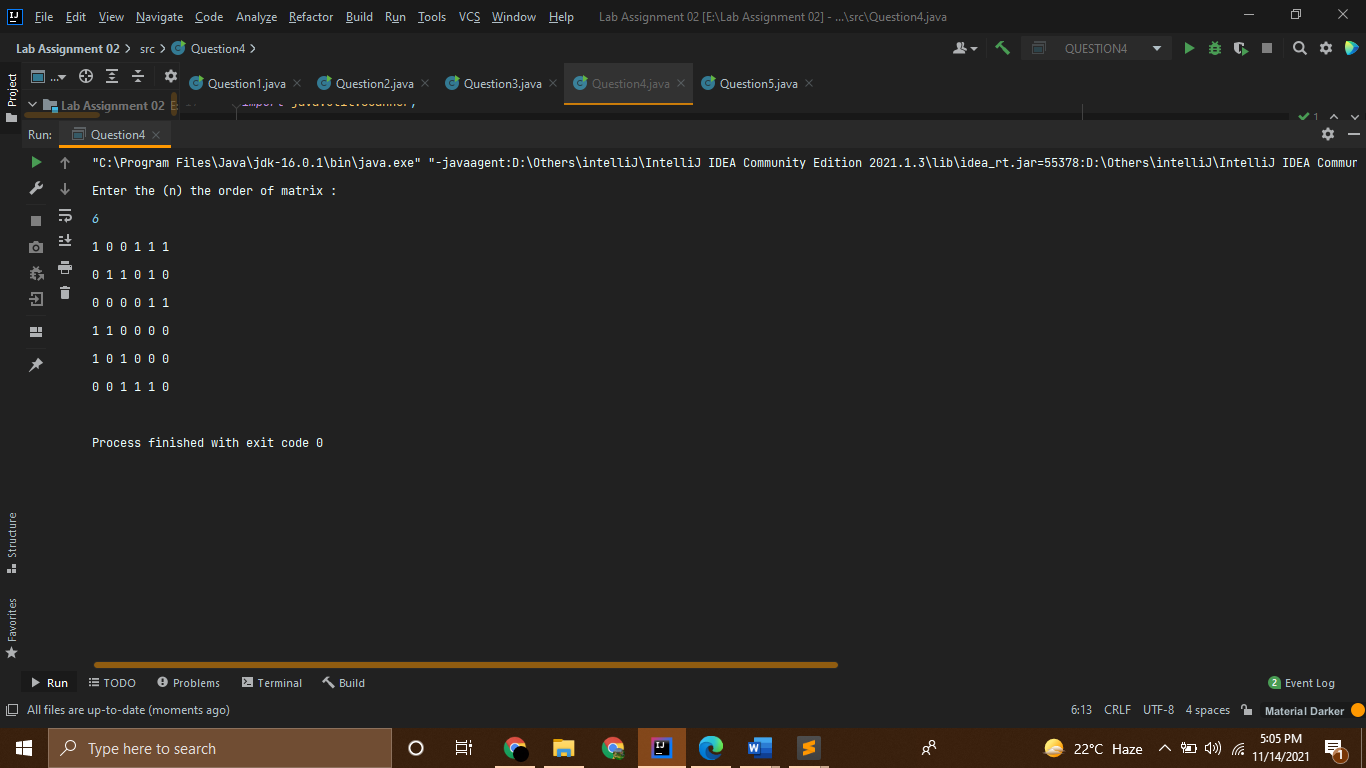
System.out.println();

}

}

}

Screenshot:



Question 5:

Source Code:

//------------------------------------------------------------

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//////////////////SP21-BCS-087--------------------------------

//----------------Lab Assignment 02---------------------------

//------------------------------------------------------------

//Question – 5: \_\_\_\_\_\_

// The area of a pentagon can be computed using the following formula:

// Write a method that returns the area of a pentagon using the following header:

//public static double area(double side)

// Write a main method that prompts the user to enter the side of a pentagon and displays its area

// Sample Run

// Enter the side: 5.5

// The area of the pentagon is 52.0444413678162

import java.util.Scanner;

public class Question5 {

public static void main(String[] args) {

Scanner input = new Scanner(System.in);

System.out.println("Enter length of the side of a pentagon");

double side = input.nextDouble();

double AREA = area(side);

System.out.println(AREA);

}

public static double area(double side){

return ((5\*(side\*side))/(4\*(Math.tan(Math.PI/5))));

}

}

Screenshot:

