Question: 8.a) Write a JAVA Program to make a Student class with proper attributes like roll no, name, stream, and college. From main create such two students and show their information.

Code:

```
import java.util.Scanner;
public class Student{
    String Name,Stream,College,name,stream,college;
    int rollNo,RollNo;

    Student(String Name,int rollNo,String Stream,String College){
        this.Name=Name;
        this.rollNo=rollNo;
        this.Stream=Stream;
        this.College=College;
    }

    void display(){
        System.out.println("\nName: "+Name+" \nRoll No: "+rollNo+"
\nStream: "+Stream+" \nCollege: "+College);

    }
    public static void main(String[]args){
        System.out.println("-------------------------Input Student
Details--------------------------");
        Scanner st=new Scanner(System.in);
        System.out.print("\nEnter The Name of 1st Student: ");
        String Name = new Scanner(System.in).nextLine();
        System.out.print("Enter Roll No: ");
        int rollNo = st.nextInt();
        System.out.print("Enter Stream: ");
        String Stream = new Scanner(System.in).nextLine();
        System.out.print("Enter College: ");
        String College = new Scanner(System.in).nextLine();
        Student s=new Student(Name,rollNo,Stream,College);
        System.out.print("\nEnter The Name of 2nd Student: ");
        String name = new Scanner(System.in).nextLine();
        System.out.print("Enter Roll No: ");
        int RollNo = st.nextInt();
        System.out.print("Enter Stream: ");
        String stream = new Scanner(System.in).nextLine();
```

```
        System.out.print("Enter College: ");
        String college = new Scanner(System.in).nextLine();
        Student t=new Student(name,RollNo,stream,college);
        System.out.print("----------------------------Student
Details---------------------------------");
        s.display();
        t.display();
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day-8-(26.09.2020)> javac Student.java
PS D:\OOPS-PCC-CS593\Day-8-(26.09.2020)> java Student
------------------------Input Student Details-------------------------

Enter The Name of 1st Student: Swapnanil Dutta
Enter Roll No: 12
Enter Stream: IT
Enter College: AOT

Enter The Name of 2nd Student: Swagato Patra
Enter Roll No: 14
Enter Stream: IT
Enter College: AOT
---------------------------Student Details--------------------------------
Name: Swapnanil Dutta
Roll No: 12
Stream: IT
College: AOT

Name: Swagato Patra
Roll No: 14
Stream: IT
College: AOT
```

Question: 8.b)Write a JAVA Program to consider the Student class in the previous Program. Assume that a student studies 6 subjects. Each subject has a title, internal marks and theory marks. Write a Program to define Student class including the subjects as array. From main create such two students and show their information including subjects' name and grand total marks.

Code:

```
class Subjects{
    String code, title;
    int part1, part2, marks = 0;
    public Subjects(String code, String title, int part1, int part2){
        this.code=code;
        this.title=title;
        this.part1=part1;
        this.part2=part2;
    }
}
class Student{
    String name, stream;
    int roll, total = 0, count = 0;
    public Student(int roll, String name, String stream, Subjects[] sub){
        this.name=name;
        this.roll=roll;
        this.stream=stream;
        for(Subjects s : sub){
            s.marks = s.part1 + s.part2;
            System.out.println("Code: " + s.code + " Title: " + s.title +
" Marks: " + s.marks);
            total += s.marks;
            count++;
        }
    }
    public String toString(){
        return "\nName: " + name + "\nRoll: " + roll + "\nStream: " +
stream + "\nTotal " + total;
    }
}
public class Student8b{
    public static void main(String[] args){
        Subjects sub[] = new Subjects[3];
```

```
        System.out.println("----------------Student
Details---------------");
        System.out.println("\n-----------------Student
1-------------------");
        sub[0] = new Subjects(" IT501", "Object Oriented Programming", 32,
54);
        sub[1] = new Subjects(" IT502", "Computer Organisation", 36, 54);
        sub[2] = new Subjects(" IT503", "Data Structures", 28, 48);
        Student s1 = new Student(12, "Swapnanil Dutta", "IT", sub);
        System.out.println("\n-----------------Student
2-------------------");
        sub[0] = new Subjects(" CSE501", "Object Oriented Programming",
40, 49);
        sub[1] = new Subjects(" CSE502", "Computer Organisation", 34, 53);
        sub[2] = new Subjects(" CSE503", "Data Structures", 29, 58);
        Student s2 = new Student(114, "Debdut Goswami", "CSE", sub);
        System.out.println(s1);
        System.out.println(s2);
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day-8-(26.09.2020)> javac Student8b.java
PS D:\OOPS-PCC-CS593\Day-8-(26.09.2020)> java Student8b
----------------Student Details---------------

-----------------Student 1-------------------
Code:  IT501 Title: Object Oriented Programming Marks: 86
Code:  IT502 Title: Computer Organisation Marks: 90
Code:  IT503 Title: Data Structures Marks: 76

-----------------Student 2-------------------
Code:  CSE501 Title: Object Oriented Programming Marks: 89
Code:  CSE502 Title: Computer Organisation Marks: 87
Code:  CSE503 Title: Data Structures Marks: 87

Name: Swapnanil Dutta
Roll: 12
Stream: IT
Total 252

Name: Debdut Goswami
Roll: 114
Stream: CSE
Total 263
```

Question: 8.c)Write a JAVA Program to consider the Student class in the first Program 8a. Assume that students study varying number of subjects. Each subject has a title, internal marks and theory marks. Write a Program to define Student class including the subjects as vararg argument of constructor. From main create such two students and show their information including subjects' name and grand total marks.

Code:

```
import java.io.BufferedReader;
import java.io.InputStreamReader;
import java.io.IOException;

class Subject{
    String title;
    double internal, theory, totalMarks;
    Subject(String title, double internal, double theory, double
totalMarks) {
        this.title = title;
        this.internal = internal;
        this.theory = theory;
        this.totalMarks= internal + theory;
    }
    public String toString() {
        return ("Subject Title = " + title + "; Internal marks = " +
internal + "/30" + " Theory = " + theory
                +"/70" + "\n Total Marks =" +this.totalMarks+"\n");
    }
}
public class Student8c{
    String name, stream, college, semester;
    int rollNo;
    double totalMarks;
    Student8c(String name, String stream, String college, int rollNo,
String semester,double Total, Subject...sub) {
        this.name = name;
        this.stream = stream;
        this.college = college;
        this.rollNo = rollNo;
        this.semester= semester;
        this.totalMarks = Total;
```

```
        for (Subject s : sub){
            s.totalMarks = s.internal + s.theory;
        }
    }
    public String toString() {
        return "\nStudent Name = "+this.name + "\nRoll no = " +
this.rollNo + "\nStream = " + this.stream + "\nSemester = " +
this.semester + "\nCollege = "
                + this.college + "\nTotal Marks = "+this.totalMarks;
    }
    public static void main(String[] args) throws IOException {
        BufferedReader buf = new BufferedReader(new
InputStreamReader(System.in));
        double Total=0.0;
        String name, stream, college, semester;
        int rollNo, n;
        System.out.println("\n----------Student 1---------");
        System.out.print("Name: ");
        name = buf.readLine();
        System.out.print("Stream: ");
        stream = buf.readLine();
        System.out.print("Semester: ");
        semester = buf.readLine();
        System.out.print("College: ");
        college = buf.readLine();
        System.out.print("Roll no: ");
        rollNo = Integer.parseInt(buf.readLine());
        System.out.print("Number of Subjects: ");
        n = Integer.parseInt(buf.readLine());
        Subject[] subs = new Subject[n];
        for (int i = 0; i < n; i++) {
            System.out.println("Subject " + (i + 1));
            System.out.print("Title: ");
            String title = buf.readLine();
            System.out.print("Internal Marks (Out of 30): ");
            double internal = Double.parseDouble(buf.readLine());
            System.out.print("Theory Marks (Out of 70): ");
            double theory = Double.parseDouble(buf.readLine());
            subs[i] = new Subject(title, internal, theory, internal +
theory);
```

```
            Total+=internal + theory;
        }
        Student8c Student1 = new Student8c(name, stream, college, rollNo,
semester, Total );
        Total=0.0;
        System.out.println("\n----------Student 2---------");
        System.out.print("Name: ");
        name = buf.readLine();
        System.out.print("Stream: ");
        stream = buf.readLine();
        System.out.print("Semester: ");
        semester = buf.readLine();
        System.out.print("College: ");
        college = buf.readLine();
        System.out.print("Roll no: ");
        rollNo = Integer.parseInt(buf.readLine());
        System.out.print("Number of Subjects: ");
        n = Integer.parseInt(buf.readLine());
        subs = new Subject[n];
        for (int i = 0; i < n; i++) {
            System.out.println("Subject " + (i + 1));
            System.out.print("Title: ");
            String title = buf.readLine();
            System.out.print("Internal Marks (Out of 30): ");
            double internal = Double.parseDouble(buf.readLine());
            System.out.print("Theory Marks (Out of 70): ");
            double theory = Double.parseDouble(buf.readLine());
            subs[i] = new Subject(title, internal, theory, internal +
theory);
            Total+=internal + theory;
        }
        Student8c Student2 = new Student8c(name, stream, college, rollNo,
semester, Total );
        System.out.println("\n------------Student
Information-----------");
        System.out.println(Student1.toString());
        System.out.println(Student2.toString());
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day-8-(26.09.2020)> javac Student8c.java
PS D:\OOPS-PCC-CS593\Day-8-(26.09.2020)> java Student8c

----------Student 1---------
Name: Swapnanil Dutta
Stream: IT
Semester: 5th
College: AOT
Roll no: 12
Number of Subjects: 3
Subject 1
Title: OOPS
Internal Marks (Out of 30): 23
Theory Marks (Out of 70): 56
Subject 2
Title: JAVA
Internal Marks (Out of 30): 21
Theory Marks (Out of 70): 45
Subject 3
Title: ALGO
Internal Marks (Out of 30): 30
Theory Marks (Out of 70): 56

----------Student 2---------
Name: Abhishek Pal
Stream: IT
Semester: 5th
College: AOT
Roll no: 66
Number of Subjects: 2
Subject 1
Title: OOPS
Internal Marks (Out of 30): 23
Theory Marks (Out of 70): 45
Subject 2
Title: DS
Internal Marks (Out of 30): 20
Theory Marks (Out of 70): 50
```

```
------------Student Information-----------

Student Name = Swapnanil Dutta
Roll no = 12
Stream = IT
Semester = 5th
College = AOT
Total Marks = 231.0

Student Name = Abhishek Pal
Roll no = 66
Stream = IT
Semester = 5th
College = AOT
Total Marks = 138.0
```

Question: 9) Design a class to represent a Bank Account. Include the following things:
Fields

- Name of the depositor
- Address of the depositor
- Account number
- Balance amount in the account

Methods

- To assign initial values
- To deposit an amount
- To withdraw an amount after checking balance
- To display the name, address and balance of a customer.

From main create object and call these methods.

Code:

```
import java.util.Scanner;

public class BankAccount{
    String name, address, accountNum;
    double balance;
    //Non parameterized constructor for convenience of initialization
    BankAccount() {
        this.name = null;
        this.address = null;
        this.accountNum = null;
        this.balance = 0.0;
    }
    //Parameterized constructor for account setup
    BankAccount(String name, String address, String accountNum) {
        this.name = name;
        this.address = address;
        this.accountNum = accountNum;
        this.balance = 0.0;
    }
    //Deposit amount to balance
    static void deposit(BankAccount account, double deposit) {
        account.balance+=deposit;
    }
    //Withdraw amount from balance
    static void withdraw(BankAccount account, double withdrawal){
        if (account.balance >= withdrawal){
            account.balance -= withdrawal;
```

```
            System.out.printf("Withdrew %.2f from account. Balance left:
%.2f",withdrawal,account.balance);
            System.out.println("");
        }
        else{
            System.out.println("Withdrawal not possible, balance too
low.");
        }
    }
    //Show account details
    static void showDetails(BankAccount account){

System.out.println("-------------------------------Details----------------
--------------");
        System.out.println("Name: "+account.name);
        System.out.println("Address: "+account.address);
        System.out.println("Account Number: "+account.accountNum);
        System.out.println("Balance: "+account.balance);
    }

    public static void main(String[] args) {
        String name, address, accountNum;
        double balance;
        Scanner input = new Scanner(System.in);
        BankAccount[] accounts = new BankAccount[10];
//Initialize account array
        int pos = 0;
//Initialize pos of array
        int c=1;
//Choice variable
        while(c != 0){
            System.out.println("Enter your choice:");
            System.out.println("  1.Create an account\n  2.Use an existing
account");
            int choice1 = input.nextInt();
            switch (choice1) {
                case 1:System.out.println("----------------------Creating
New Account--------------------------");
                    System.out.println("Enter your name: ");
                    name = new Scanner(System.in).nextLine();
```

```
                    System.out.println("Enter your address: ");
                    address = new Scanner(System.in).nextLine();
                    accountNum = "112254125"+String.valueOf(pos);
                    accounts[pos] = new BankAccount(name, address,
accountNum);
                    showDetails(accounts[pos]);
                    pos++;
                    break;

                case 2:System.out.println("------------------------Using
Existing Account-------------------------");
                    System.out.println("Enter the bank account number: ");
                    String number = new Scanner(System.in).nextLine();
                    int flag=0, index=0;
                    for(int i = 0; i < pos; i++){
                        if (accounts[i].accountNum.equals(number) &&
accounts[i].accountNum != null){
                            flag=1;
                            index=i;
                        }
                    }
                    if(flag == 0){
                        System.out.println("Account Not Found");
                    }
                    else{
                        int choice2=0;

System.out.println("------------------------Accessing Account:
"+number+"----------------------------");
                        while(choice2!=4){
                            System.out.println("\nWhat do you want to
do?");
                            System.out.println("  1.Deposit an amount\n
2.Withdraw an amount\n  3.Show Details\n  4.Exit Account");
                            choice2 = new Scanner(System.in).nextInt();
                            switch (choice2){
                                case 1:System.out.print("Enter your
deposit amount: ");
                                    double depositAmount =
input.nextDouble();
```

```
                                    deposit(accounts[index],
depositAmount);
                                    System.out.println("Amount
Deposited!");
                                    break;

                                case 2:System.out.print("Enter your
withdrawal amount: ");
                                    double withdrawal =
input.nextDouble();
                                    withdraw(accounts[index], withdrawal);
                                    break;

                                case 3:showDetails(accounts[index]);
                                    break;

                                case 4:System.out.println("Exiting Account
"+number);
                                    break;

                                default:System.out.println("Invalid
input");
                                    break;
                            }
                        }
                    }
                    break;

                default:System.out.println("Invalid input");
                    break;
            }
            System.out.println("Do you want to continue? Enter 1 for Yes,
0 for No");
            c = input.nextInt();
        }
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day-8-(26.09.2020)> javac BankAccount.java
PS D:\OOPS-PCC-CS593\Day-8-(26.09.2020)> java BankAccount
Enter your choice:
  1.Create an account
  2.Use an existing account
1
----------------------Creating New Account-------------------------
Enter your name:
Swapnanil Dutta
Enter your address:
Bagbazar, Chandannagar
------------------------------Details-------------------------------
Name: Swapnanil Dutta
Address: Bagbazar, Chandannagar
Account Number: 1122541250
Balance: 0.0
Do you want to continue? Enter 1 for Yes, 0 for No
1
Enter your choice:
  1.Create an account
  2.Use an existing account
1
----------------------Creating New Account-------------------------
Enter your name:
Swagato Patra
Enter your address:
Gyan Mukherjee Road, Krishnanagar
------------------------------Details-------------------------------
Name: Swagato Patra
Address: Gyan Mukherjee Road, Krishnanagar
Account Number: 1122541251
Balance: 0.0
Do you want to continue? Enter 1 for Yes, 0 for No
1
```

```
  2.Use an existing account
1
----------------------Creating New Account-------------------------
Enter your name:
Abhishek Pal
Enter your address:
Khadinamore, Chinsurah
------------------------------Details-------------------------------
Name: Abhishek Pal
Address: Khadinamore, Chinsurah
Account Number: 1122541252
Balance: 0.0
Do you want to continue? Enter 1 for Yes, 0 for No
1
Enter your choice:
  1.Create an account
  2.Use an existing account
2
------------------------Using Existing Account-----------------------
Enter the bank account number:
1122541251
-----------------------Accessing Account: 1122541251--------------------------

What do you want to do?
  1.Deposit an amount
  2.Withdraw an amount
  3.Show Details
  4.Exit Account
3
------------------------------Details-------------------------------
Name: Swagato Patra
Address: Gyan Mukherjee Road, Krishnanagar
Account Number: 1122541251
Balance: 0.0

What do you want to do?
  1.Deposit an amount
  2.Withdraw an amount
  3.Show Details
  4.Exit Account
```

```
3
------------------------------Details-------------------------------
Name: Swagato Patra
Address: Gyan Mukherjee Road, Krishnanagar
Account Number: 1122541251
Balance: 0.0

What do you want to do?
  1.Deposit an amount
  2.Withdraw an amount
  3.Show Details
  4.Exit Account
1
Enter your deposit amount: 5000
Amount Deposited!

What do you want to do?
  1.Deposit an amount
  2.Withdraw an amount
  3.Show Details
  4.Exit Account
2
Enter your withdrawal amount: 1500
Withdrew 1500.00 from account. Balance left: 3500.00

What do you want to do?
  1.Deposit an amount
  2.Withdraw an amount
  3.Show Details
  4.Exit Account
3
------------------------------Details-------------------------------
Name: Swagato Patra
Address: Gyan Mukherjee Road, Krishnanagar
Account Number: 1122541251
Balance: 3500.0

What do you want to do?
  1.Deposit an amount
  2.Withdraw an amount
  3.Show Details
  4.Exit Account
4
Exiting Account 1122541251
Do you want to continue? Enter 1 for Yes, 0 for No
```