Name : Syed Arham

Roll Number : BSE-2A  
  
  
Q1 :-  
  
package Q1;

import java.util.ArrayList;

*public* *class* Student {

    int Std\_id;

    String Std\_name;

    int Std\_age;

    ArrayList<Sports> SportInterest;

    ArrayList<Mentor> Mentor\_assigned;

    Student(int *Std\_id*,String *Std\_name*,int *Std\_age*){

        this.Std\_id=*Std\_id*;

        this.Std\_age=*Std\_age*;

        this.Std\_name=*Std\_name*;

        SportInterest=*new* ArrayList<>();

        Mentor\_assigned=*new* ArrayList<>();

    }

*public* void Display\_Student\_details()

    {

        System.out.println("Student Name: "+Std\_name);

        System.out.println("Student ID: "+Std\_id);

        System.out.println("Student Age: "+Std\_id);

        System.out.println("Sports Interest: "+ SportInterest);

    }

*public* void Register\_for\_mentorship(Mentor *m*){

        Mentor\_assigned.add(*m*);

    }

*public* void View\_mentor\_details(){

*for*(Mentor m*:*Mentor\_assigned)

        {

            m.Display\_mentor\_details();

        }

    }

*public* void Update\_sports\_interest(Sports *sports*){

        SportInterest.add(*sports*);

    }

}

package Q1;

import java.util.ArrayList;

*public* *class* Sports {

*private* int Sports\_id;

*private* String Sports\_name;

*private* String Sports\_description;

*private* ArrayList<Skills> Required\_skills;

    Sports(int *sports\_id*,String *sports\_name*,String *sports\_description*,ArrayList *required\_skills*){

        this.Sports\_id=*sports\_id*;

        this.Sports\_name=*sports\_name*;

        this.Sports\_description=*sports\_description*;

        this.Required\_skills=*required\_skills*;

    }

*public* void Add\_skill(Skills *s*){

        Required\_skills.add(*s*);

    }

*public* void Remove\_skill(Skills *s*){

*if*(Required\_skills.contains(*s*)){

            Required\_skills.remove(*s*);

        }

*else* {

            System.out.println("Skill not found");

        }

    }

}

package Q1;

*public* *class* Skills {

*private* int Skill\_id;

*private* String Skill\_name;

*private* String Skill\_description;

    Skills(int *skill\_id*,String *skill\_name*,String *skill\_description*){

        this.Skill\_name=*skill\_name*;

        this.Skill\_description=*skill\_description*;

        this.Skill\_id=*skill\_id*;

    }

*public* void Show\_Skill\_details(){

        System.out.println("Skill ID: "+Skill\_id);

        System.out.println("Skill Name: "+Skill\_name);

        System.out.println("Skill Description: "+Skill\_description);

    }

*public* void Update\_skill\_description(String *skill\_description*){

        this.Skill\_description=*skill\_description*;

    }

}

package Q1;

import java.util.ArrayList;

*public* *class* Mentor {

*private* int Mentor\_id;

*private* String Mentor\_name;

*private* int Max\_learners;

*private* ArrayList<Student> Assigned\_learners;

*private* ArrayList<String> Sports\_expertise;

    Mentor(int *Mentor\_id*,String *Mentor\_name*,int *Max\_learners*, ArrayList<String>*Sports\_expertise*)

    {

        this.Mentor\_id=*Mentor\_id*;

        this.Mentor\_name=*Mentor\_name*;

        this.Max\_learners=*Max\_learners*;

        this.Sports\_expertise=*Sports\_expertise*;

        this.Assigned\_learners=*new* ArrayList<>();

    }

*public* void Assign\_learner(Student *s*){

*if*(Assigned\_learners.size()<Max\_learners)

        {

            Assigned\_learners.add(*s*);

            System.out.println("Student Added Successfully");

        }

*else* {

            System.out.println("Cannot Assign(learners full)");

        }

    }

*public* void Remove\_learner(Student *s*){

*if*(Assigned\_learners.contains(*s*)){

                Assigned\_learners.remove(*s*);

                System.out.println("Student Removed Successfully");

            }

*else* {

                System.out.println("Student Not found");

            }

    }

*public* void View\_learners(){

*for* (Student assignedLearner *:* Assigned\_learners) {

           assignedLearner.Display\_Student\_details();

       }

    }

*public* void Provide\_guidance(){

        System.out.println("Bonus Tip: Sleep,Pray and Work Hard");

    }

*public* void Display\_mentor\_details(){

        System.out.println("Mentor Id: "+Mentor\_id);

        System.out.println("Mentor Name: "+Mentor\_name);

        System.out.println("Sports Expertise: "+Sports\_expertise);

        System.out.println("Max Learners: "+Max\_learners);

    }

    }

package Q1;

import java.util.ArrayList;

*public* *class* Main {

*public* *static* void main(String[] *args*) {

        Student std1=*new* Student(2551,"SYed ARham",19);

        Student std2=*new* Student(3007,"Abdul-Rafay",19);

        ArrayList<String> M\_Sports\_expertise=*new* ArrayList<>();

        M\_Sports\_expertise.add("Cricket");

        M\_Sports\_expertise.add("Basket Ball");

        Mentor men1=*new* Mentor(2899,"Ali",4,M\_Sports\_expertise);

        Skills skill1=*new* Skills(1221,"Batting","ability to hit the ball");

        Skills skill2=*new* Skills(1332,"Bowling","ability to throw the ball");

        Skills skill3=*new* Skills(1414,"Fielding","ability to catch the ball");

        ArrayList<Skills> skills=*new* ArrayList<>();

        skills.add(skill1);

        skills.add(skill2);

        Sports sport1=*new* Sports(1212,"Cricket","Cricket is played with a ball and bat",skills);

        std1.Register\_for\_mentorship(men1);

        std1.Update\_sports\_interest(sport1);

        std1.View\_mentor\_details();

        men1.Assign\_learner(std2);

        men1.Provide\_guidance();

        men1.View\_learners();

        men1.Remove\_learner(std1);

        men1.View\_learners();

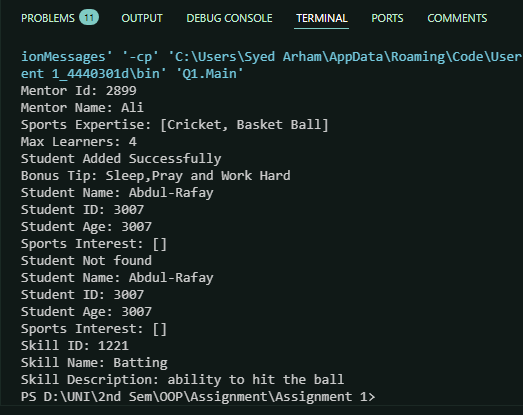
        sport1.Add\_skill(skill3);

        sport1.Remove\_skill(skill1);

        skill1.Show\_Skill\_details();

    }

}

Output :-  


Q2 :-  
package Q2;

*public* *class* Ball {

*private* int x;

*private* int y;

     Ball(int *x*,int *y*){

         this.x = *x*;

         this.y = *y*;

     }

     Ball(){

         this.x = 0;

         this.y = 0;

     }

*public* int getX() {

*return* x;

     }

*public* int getY() {

*return* y;

     }

*public* void move(int *dx*,int *dy*) {

         this.x += *dx*;

         this.y += *dy*;

     }

*public* int[] getPosition(){

*return* *new* int[]{this.x,this.y};

     }

}

package Q2;

*public* *class* Goal {

*private* *final* int y = 3;

*private* *final* int x = 3;

*public* Boolean isGoalReached(int *y*, int *x*) {

*if*(this.y == *y* && this.x == *x*)

        {

*return* true;

        }

*else* *return* false;

    }

}

package Q2;

*public* *class* Robot {

    String Robot\_name;

    int hits;

    Robot(String *robot\_name*){

        this.Robot\_name=*robot\_name*;

        this.hits=0;

    }

*public* int getHits() {

*return* hits;

    }

*public* void setHits(int *hits*) {

        this.hits = *hits*;

    }

*public* String getName() {

*return* Robot\_name;

    }

*public* void setName(String *name*) {

        this.Robot\_name = *name*;

    }

    void hit\_ball(Ball *ball*,String *direction*){

*if*(*direction*.equalsIgnoreCase("right")){

*ball*.move(1,0);

        }

*if*(*direction*.equalsIgnoreCase("left")){

*ball*.move(-1,0);

        }

*if* (*direction*.equalsIgnoreCase("up")){

*ball*.move(0,-1);

        }

*if* (*direction*.equalsIgnoreCase("down")){

*ball*.move(0,1);

        }

        this.hits++;

    }

}

package Q2;

*public* *class* Team {

*private* String TeamName;

*private* Robot robot;

    Team(String *TeamName*,Robot *robot*) {

        this.TeamName = *TeamName*;

        this.robot = *robot*;

    }

*public* String getTeamName() {

*return* TeamName;

    }

*public* Robot getRobot() {

*return* robot;

    }

}

package Q2;

import java.util.Scanner;

*public* *class* Main {

*public* *static* void main(String[] *args*) {

        Scanner sc = *new* Scanner(System.in);

        System.out.println("Football Game Simulator!!");

        System.out.println("Enter Team 1's Name:");

        String t1\_name = sc.nextLine();

        System.out.println("Enter Team 2's Name:");

        String t2\_name = sc.nextLine();

        System.out.println("Enter Robot 1's Name:");

        String r1\_name = sc.nextLine();

        System.out.println("Enter Robot 2's Name:");

        String r2\_name = sc.nextLine();

        Robot R1=*new* Robot(r1\_name);

        Robot R2=*new* Robot(r2\_name);

        Team t1=*new* Team(t1\_name,R1);

        Team t2=*new* Team(t2\_name,R2);

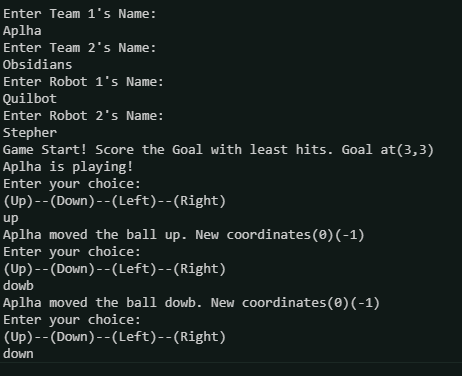
        Game G=*new* Game(t1,t2);

        G.startGame();

    }

}

Output :-



Q3:-  
package Q3;

*public* *class* Vehicles {

*private* String Name;

*private* String Model;

*private* int Rental\_price;

*private* String Eligibility;

*public* Vehicles(String *name*,String *model*, int *rental\_price*, String *eligibility*) {

        this.Name=*name*;

        this.Model = *model*;

        this.Rental\_price = *rental\_price*;

        this.Eligibility = *eligibility*;

    }

*public* String getEligibility() {

*return* Eligibility;

    }

*public* void Display\_Vehicles(){

        System.out.println("Model: "+Model);

        System.out.println("Rental Price: "+Rental\_price);

        System.out.println("Eligibility: "+Eligibility);

    }

*public* void displayVehicles() {

        System.out.println("Name: "+Name);

        System.out.println("Model: "+Model);

        System.out.println("Rental Price: "+Rental\_price);

        System.out.println("Eligibility: "+Eligibility);

    }

}

package Q3;

import java.util.Scanner;

*public* *class* User {

*private* int age;

*private* String LicenseType;

*private* String UserId;

*private* String ContactInformation;

*public* String getUserId() {

*return* UserId;

    }

    Boolean VehicleAllotted;

*public* String getLicenseType() {

*return* LicenseType;

    }

*public* User(int *age*, String *licenseType*, String *userId*, String *contactInformation*) {

        this.age = *age*;

        LicenseType = *licenseType*;

        UserId = *userId*;

        ContactInformation = *contactInformation*;

        VehicleAllotted = false;

    }

*public* void UpdateInformation(){

        Scanner sc=*new* Scanner(System.in);

        System.out.println("What do you want to update?");

        System.out.println("1. Age:");

        System.out.println("2. LicenseType:");

        System.out.println("3. ContactInformation:");

        int choice=sc.nextInt();

*switch*(choice){

*case* 1*:*

                System.out.println("Enter Age :");

                int age=sc.nextInt();

                this.age=age;

                System.out.println("Age updated");

*break*;

*case* 2*:*

                System.out.println("Enter LicenseType :");

                String licenseType=sc.next();

                this.LicenseType=licenseType;

                System.out.println("License type updated");

*break*;

*case* 3*:*

                    System.out.println("Enter ContactInformation :");

                    String contactInformation=sc.next();

                    this.ContactInformation=contactInformation;

                    System.out.println("Contact information updated");

*break*;

*default:*

*break*;

        }

    }

*public* void setVehicleAllotted(boolean *b*) {

        this.VehicleAllotted=*b*;

    }

}

package Q3;

import java.util.\*;

*public* *class* Main {

*public* *static* void main(String[] *args*) {

        Vehicles v1 = *new* Vehicles("Toyota", "2010", 2500, "Full");

        Vehicles v2 = *new* Vehicles("Honda", "2015", 1500, "intermediate");

        Vehicles v3 = *new* Vehicles("Suzuki", "2018", 500, "Learner");

        ArrayList<Vehicles> vehicles = *new* ArrayList<>();

        vehicles.add(v1);

        vehicles.add(v2);

        vehicles.add(v3);

        User u1 = *new* User(20, "Full", "3055", "contact@syedarham.tech");

        User u2 = *new* User(21, "Intermediate", "2551", "zaryab@syedarham.tech");

        User u3 = *new* User(19, "Learner", "3007", "rafay@syedarham.tech");

        ArrayList<User> users = *new* ArrayList<>();

        users.add(u1);

        users.add(u2);

        users.add(u3);

        Scanner sc = *new* Scanner(System.in);

        System.out.println("Available Vehicles:");

*for* (Vehicles v *:* vehicles) {

            v.displayVehicles();

        }

*for* (User user *:* users) {

            boolean vehicleAllotted = false;

*for* (Vehicles v *:* vehicles) {

*if* (user.getLicenseType().equalsIgnoreCase(v.getEligibility())) {

                    System.out.println("Vehicle Allotted to User: " + user.getUserId());

                    vehicles.remove(v);

                    user.setVehicleAllotted(true);

                    vehicleAllotted = true;

*break*;

                }

            }

*if* (!vehicleAllotted) {

                System.out.println(user.getUserId() + ": Vehicle Not Allotted");

            }

        }

        int choiceInt = 0;

*do* {

            System.out.println("Do you want to update information? (Y/N)");

            String choice = sc.nextLine();

*if* (choice.equalsIgnoreCase("Y")) {

                System.out.println("Which user's information would you like to update?");

                System.out.println("1. "+u1.getUserId());

                System.out.println("2. "+u2.getUserId());

                System.out.println("3. "+u3.getUserId());

                System.out.println("4. Exit");

                choiceInt = sc.nextInt();

*if*(choiceInt == 1) {

                    u1.UpdateInformation();

                }

*else* *if*(choiceInt == 2) {

                    u2.UpdateInformation();

                }

*else* *if*(choiceInt == 3) {

                    u3.UpdateInformation();

                }

            }

*else* *if* (choice.equalsIgnoreCase("N")) {

*break*;

            }

*if*(choiceInt==4){

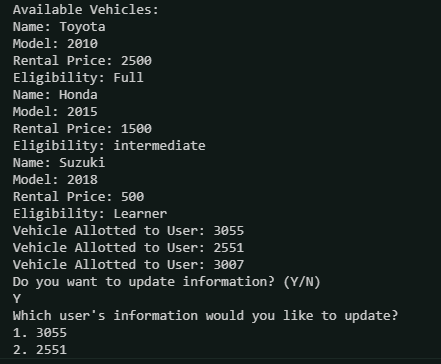
*break*;

            }

        }*while* (choiceInt!=4);

    }

}

Output :-  
  


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Q4 :-  
  
package Q4;

*public* *class* Attendance {

*private* int Student\_Id;

*private* String date;

*private* Boolean Status;

*public* int getStudent\_Id() {

*return* Student\_Id;

    }

*public* String getDate() {

*return* date;

    }

*public* Boolean getStatus() {

*return* Status;

    }

*public* Attendance(int *Student\_Id*, String *date*, Boolean *Status*) {

        this.Student\_Id = *Student\_Id*;

        this.date = *date*;

        this.Status = *Status*;

    }

*public* *static* void RecordAttendance(Student *student*,Bus *bus*){

        System.out.println(*student*.getName()+" ID: "+*student*.getName()+" tapped thier card on bus "+*bus*.getBus\_number());

        System.out.println("Attendance Recorded for "+java.time.LocalDate.now());

    }

}

package Q4;

*public* *class* Bus {

*private* int Bus\_id;

*private* String Bus\_number;

*private* Transportation AssignedRoute;

*public* Bus( String *bus\_number*, int *bus\_id*) {

        Bus\_number = *bus\_number*;

        Bus\_id = *bus\_id*;

    }

*public* int getBus\_id() {

*return* Bus\_id;

    }

*public* String getBus\_number() {

*return* Bus\_number;

    }

*public* Transportation getAssignedRoute() {

*return* AssignedRoute;

    }

*public* void setAssignedRoute(Transportation *assignedRoute*) {

        this.AssignedRoute = *assignedRoute*;

        System.out.println("Bus:"+Bus\_number+" Assigned Route:"+*assignedRoute*.getRouteName());

    }

}

package Q4;

*public* *class* Student {

*private* String name;

*private* String StdId;

*private* double Balance;

*private* *static* *final* double Sem\_fee=5000;

*private* Boolean TransportationCard;

*public* Student(String *name*, String *stdId*) {

        this.name = *name*;

        this.StdId = *stdId*;

        this.Balance = 0;

        this.TransportationCard = false;

    }

*public* String getName() {

*return* name;

    }

*public* String getStdId() {

*return* StdId;

    }

*public* double getBalance() {

*return* Balance;

    }

*public* Boolean getTransportationCard() {

*return* TransportationCard;

    }

*public* void register(){

        System.out.println(this.name + " has been registered");

    }

*public* void payFee(double *Fee*){

*if*(*Fee*>=Sem\_fee){

            Balance+=*Fee*;

            TransportationCard=true;

            System.out.println("Fee has been payed for "+this.name);

        }

*else*{

            System.out.println("Insufficient funds");

        }

    }

*public* void CardStatus(){

*if*(TransportationCard){

            System.out.println("Transportation Card is Active");

        }

*else*{

            System.out.println("Transportation Card is not Active");

        }

    }

*public* void tapCard(Bus *bus*){

*if*(TransportationCard){

        Attendance.RecordAttendance(this,*bus*);

        }

*else* {

            System.out.println("Card Unactive,Kindly Pay Fees");

        }

    }

}

package Q4;

import java.util.ArrayList;

*public* *class* Transportation {

*private* int route\_id;

*private* String routeName;

*private* ArrayList<String> stops;

*public* String getRouteName() {

*return* routeName;

    }

*public* int getRoute\_id() {

*return* route\_id;

    }

*public* Transportation(int *route\_id*, String *routeName*) {

        this.route\_id = *route\_id*;

        this.routeName = *routeName*;

        stops=*new* ArrayList<>();

    }

*public* void addStop(String *stop*) {

        stops.add(*stop*);

        System.out.println("Stop added to route"+this.routeName);

    }

*public* void removeStop(String *stop*) {

*if*(stops.contains(*stop*)){

            stops.remove(*stop*);

        }

*else* {

            System.out.println("Stop not found in route"+this.routeName);

        }

    }

*public* ArrayList<String> getStops() {

*return* stops;

    }

}

package Q4;

*public* *class* Main {

*public* *static* void main(String[] *args*) {

        System.out.println("24k-2551");

        System.out.println("Syed Arham");

        System.out.println("BSE-2A");

        Student s1=*new* Student("Syed Arhan","2551");

        Student s2=*new* Student("Abdul Rafau","3007");

        s1.register();

        s2.register();

        s1.payFee(10000);

        s2.payFee(20000);

        s1.CardStatus();

        s2.CardStatus();

        Transportation route1=*new* Transportation(111,"Route 1");

        route1.addStop("Stop 1");

        route1.addStop("Stop 2");

        Bus b1=*new* Bus("BUS 1",1001);

        b1.setAssignedRoute(route1);

        s1.tapCard(b1);

        s2.tapCard(b1);

    }

}  
  
Output :-

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