Problem 1 : Accelerate the Car (20 Marks) a) Create a new Java class named Car that has the following private fields ⚫ year - The year field is an int that holds a car's year model (e.g. 2010) ⚫ make - The make field is a String object that holds the make of the car (e.g. "Porsche") ⚫ speed - The speed field is an double that holds a car's current speed (e.g. 25.0) b) In addition, the Car class should have the following methods. ⚫ Constructor - The constructor should accept the car's year, make, and beginning speed as arguments ◆ These values should be used to initialize the Car's year, make, and speed fields ⚫ Getter Methods - Write three accessor (getter) methods to get the values stored in an object's fields ⚫ accelerate - Write an accelerate method that has no arguments (parameters) passed to it and adds 1 to the speed field each time it is called ◆ For example: if the car was going 3 mph, accelerate would set the speed to 4 mph c) Write a separate java class RaceTrack in a separate file with a main() method that ⚫ Create a new Car object (using the Car constructor method), passing in the year, make, and speed ⚫ Display the current status of the car object using the getter methods getYear(), getMake(), and getSpeed() ⚫ Call the car's accelerate method and then re-display the car's speed using getSpeed()

class Car{

private int year;

private String make;

private double speed;

Car(int year,String make,double beginning\_speed){

this.year = year;

this.make = make;

this.speed = beginning\_speed;

}

public int getYear(){

return this.year;

}

public String getMake(){

return this.make;

}

public double getSpeed(){

return this.speed;

}

public void Accelerate(){

this.speed++;

}

}

class RaceTrack{

public static void main(String[] args){

Car c1 = new Car(2010,"Porsche",25.0);

System.out.println("year == "+c1.getYear());

System.out.println("Make in == "+c1.getMake());

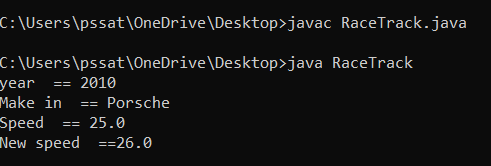
System.out.println("Speed == "+c1.getSpeed());

c1.Accelerate();

System.out.println("New speed =="+c1.getSpeed());

}

}



Problem 2 : Inventory Management (20 Marks) Write a program to create an inventory of items which will allow basic inventory management such as below ============================================================== 1) Add Item (Prevent duplication) 2) Display complete inventory in sorted order of item names as well as itemId. 3) Remove Item. 4) Exit Please enter your choice (1-3) 1. Define a class Item with two attributes itemId and itemName. 2. The implementation should use ArrayList collection where every element of ArrayList collection holds the object of class Item. 3. Put constraint on ArrayList of Item objects that, it should not allow insertion when the values of attributes itemID and itemName previously exist together in the ArrayList. Ex : If itemId and itemName with values (1, “Item1”) respectively, already exists in the ArrayList Collection, the

import java.util.\*;

class Item{

Integer item\_id;

String item\_name;

Item(int item\_id,String item\_name ){

this.item\_name=item\_name;

this.item\_id=item\_id;

}

Item(){}

void setitem\_id(int item\_id){

this.item\_id=item\_id;

}

void setitem\_name(String item\_name){

this.item\_name=item\_name;

}

public String toString(){

return this.item\_id+" "+this.item\_name;

}

@Override

public boolean equals(Object o){

if(o instanceof Item){

Item temp= (Item) o;

if(this.item\_id.equals(temp.item\_id) && (this.item\_name.equals(temp.item\_name) )){

return true;

}

}

return false;

}

@Override

public int hashCode(){

//System.out.println("hashCode invoked!!");

int prime = 13;

int val = 1;

val = val\*prime + this.item\_id.hashCode();

val = val\*prime + this.item\_name.hashCode();

return val;

//return 40;

}

}

class namesort implements Comparator<Item>{

public int compare(Item I1,Item I2){

return I1.item\_name.compareTo(I2.item\_name);

}

}

class idsort implements Comparator<Item>{

public int compare(Item I1,Item I2){

return I1.item\_id-(I2.item\_id);

}

}

class Inventory{

static Item I=new Item();

static ArrayList<Item> list=new ArrayList<> ();

public static void main(String[] args){

Scanner sc=new Scanner(System.in);

int choice;

Item I1=new Item(1,"A");

Item I2=new Item(3,"R");

Item I3=new Item(2,"Z");

Item I4=new Item(4,"H");

Item I5=new Item(10,"M");

list.add(I1);

list.add(I2);

list.add(I3);

list.add(I4);

list.add(I5);

do{

System.out.println("Enter your choice ==");

System.out.println("1) Add Item.\n2) Display complete inventory in sorted order of item names as well as item\_id.\n3) Remove Item.\n4) Exit");

choice=sc.nextInt();

switch(choice){

case 1:

System.out.println("Enter your details as follows");

System.out.println("Enter Item you want add");

//int n=sc.nextInt();

for(int i=1;i<=1;i++){

System.out.println("Enter id of item ");

int d=sc.nextInt();

I.setitem\_id(d);

System.out.println("Enter name of item ");

sc.nextLine();

String ss=sc.nextLine();

I.setitem\_name(ss);

if (!list.contains(I)){

list.add(I);}

}

System.out.println("Added items as follows");

System.out.println(list);

break;

case 2:

System.out.println("before sorting");

System.out.println(list);

System.out.println("Sorting by id");

idsort n2=new idsort();

Collections.sort(list,n2);

System.out.println(list);

System.out.println("Sorting by name");

namesort n1=new namesort();

Collections.sort(list,n1);

System.out.println(list);

break;

case 3:

System.out.println("List as follows");

System.out.println(list);

System.out.println("Enter index od item which you want to remove index start from 0");

int re=sc.nextInt();

list.remove(re);

System.out.println("List after removal");

System.out.println(list);

break;

case 4:

System.out.println("Thank you");

break;

}

}while(choice!=4);

}

}

