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**Final Exam:**

Part 1 :

Question 1 :

A:

package exam;

public abstract class Account {

protected int number ;

protected double balance ;

public Account(int AccNumber , double bal){

this.number=AccNumber ;

this.balance=bal ;

}

public abstract double computeIntrest() ;

public String ToString() {

return "The account number is : "+number+"and the balance is : " +balance ;

}

}

B-C:

package exam;

public class Saving extends Account implements Comparable <Saving>{

private double rate ;

private int nbYear ;

//Constructor

public Saving(int number , double AccBalance , double Newrate , int NewnbYear ) {

super(number , AccBalance) ;

if(rate>0){

this.rate=Newrate ;

}else {

this.rate=0 ;

}

if(NewnbYear>0){

this.nbYear=NewnbYear ;

}else {

this.nbYear=0 ;

}

}

@Override

public String toString() {

String a="The account number is : "+number+"and the balance is : " +balance ;

String s=a+"\nThe rate is :"+rate+"\nThe year number is : "+nbYear ;

return s ;

}

@Override

public double computeIntrest() {

double intrest =balance\*rate\*nbYear ;

return intrest ;

}

@Override

public int compareTo(Saving NewS) {

if(this.rate<NewS.rate)

return -1 ;

if(this.rate>NewS.rate)

return 1 ;

else return 0 ; }}

D:

package exam;

public class Customer {

private int id ;

private String Name ;

private Account[] Accounts ;

private static int accountsCounter ;

public Customer (int id , String Name ) {

this.id=id ;

this.Name=Name ;

Accounts=new Account[10] ;

accountsCounter++ ;

}

public void addAccount(Account c ){

Accounts[accountsCounter-1]=c ;

}

public Account[] getAccounts () {

return Accounts ;

}

public String toString() {

String s = "The customer id is :"+id+"the customer name is :"+ Name ;

for ( int i =0 ; i<Accounts.length ;i++){

s=s+Accounts[i].toString() ;

}

return s ;

}}

Question 2 :

package exam;

public class Exam {

public static void main(String[] args) {

Customer c1 = new Customer(1,"Sami") ;

Saving s1= new Saving(1,6000,2.5,5) ;

Saving s2= new Saving(2,10000,3.5,10) ;

Checking cheking1=new Checking(1,3000) ;

Checking cheking2=new Checking(2,2000) ;

c1.addAccount(s1);

c1.addAccount(s2);

c1.addAccount(cheking1);

c1.addAccount(cheking2);

for(int i=0;i<4;i++)

{

if(c1.getAccounts()[i].computeIntrest()!=0)

System.out.println(c1.getAccounts()[i].computeIntrest());

}

if(s1.compareTo(s2)==1)

{

System.out.println("The first account has a bigger interest than the second");

}

else if(s1.compareTo(s2)==-1)

{

System.out.println("The second account has a bigger interest than the first");

}

else

System.out.println("Both accounts have the same interest");

for(int i=0; i<4;i++)

{

c1.getAccounts()[i].toString();

}}}

Part 2 :

Question 1 :

A-B:

package part2exam;

import java.util.ArrayList;

public class Audio extends Disk {

private String artist ;

private ArrayList<String> trackList ;

public Audio(String title, String artist , int playTime ){

super(title, playTime);

this.artist=artist ;

trackList = new ArrayList<String>();

}

public String getArtist() {

return artist;

}

public ArrayList<String> getTrackList() {

return trackList;

}

public void setArtist(String artist) {

this.artist = artist;

}

public void setTrackList(ArrayList<String> trackList) {

this.trackList = trackList;

}

public void addTrack (String Track) {

trackList.add(Track) ;

}

public void removeTrack (String Track) {

trackList.remove(Track) ;

}

@Override

public String toString() {

String s = "Title: " +getTitle() + "\nPlay time: " + getplayTime();

s=s+"\nArtist name: " + artist + "\n List of tracks: ";

for ( int i=0 ; i<trackList.size() ; i++) {

int n=i+1 ;

s=s+"\nTrack"+n+" :" + trackList.get(i) ;

}

return s ;

} }

Question 2 :

package part2exam;

import java.util.Scanner;

public class Part2Exam {

public static void main(String[] args) {

Disk D[]= new Disk[10];

Audio a1 = new Audio("Test","Jhon Smith",1);

Video v1 = new Video("Test2","Comedy","How i met your mother",20);

Video v2 = new Video("Test3","Test3","Test3",10);

D[0]=a1;

D[1]=v1;

D[2]=v2;

for(int i=0;i<10;i++)

{

if (D[i]instanceof Video)

System.out.println(((Video)D[i]).getDirector());

}

for(int i=0;i<10;i++)

{

if (D[i]instanceof Audio)

{

((Audio)D[i]).addTrack("Hello");

break;

}

}

Scanner sc = new Scanner (System.in);

String name;

name=sc.next();

for(int i=0;i<10;i++)

{

if (D[i]instanceof Audio)

{

if(((Audio)D[i]).getTrackList().contains(name)){

System.out.println("The track is found");

break;

}}

System.out.println("The track is not in found the disk");

}} }