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| File:COMSATS new logo.jpg - Wikimedia Commons  OBJECT ORIENTED PROGRAMMING  *Lab Task 02*  *Constructors and Methods* | **submitted by:**  **Shahzaneer Ahmed**  **registration number:**  **sp21-bcs-087**  **submitted to:**  **mA’M sANEEHA aMIR**  **date of submission:**  **FEBRUARY 28, 2022** |

Activity – 1

# Source Code:

public class Account{

    int yearOfOpening;

    double balance;

    String cnic;

    Account(){

*//  default constructor*

    }

    Account(double bal){

        balance = bal;

    }

    Account(int year,double bal,String nic){

        yearOfOpening = year;

        balance = bal;

        cnic= nic;

    }

    void setValues(int year,double bal,String nic){

        yearOfOpening = year;

        balance = bal;

        cnic= nic;

    }

    void display(){

        System.out.println("The year of opening is "+yearOfOpening);

        System.out.println("The current balance is "+balance);

        System.out.println("The CNIC is "+cnic);

    }

    double withdraw(double withdrawalMoney){

*if*(withdrawalMoney<0){

            System.out.println("You cannot enter negative withdrawal ammount");

*return* balance;

        }

*else*{

*return* balance = balance - withdrawalMoney;

        }

    }

    double deposit(double depositMoney){

*if*(depositMoney<0){

            System.out.println("You cannot enter negative deposit money ");

*return* balance;

        }

*else*{

*return* depositMoney;

        }

    }

    int ageOfAccount(int currentYear){

*return* currentYear - yearOfOpening;

    }

}

Activity – 2

# Source Code:

public class Book {

    String author;

    String [] chapters = *new* String [5];

    Book(){

    }

    Book(String auth,String []chap){

        author = auth;

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

            chapters[i] = chap[i];

        }

    }

    void display(){

        System.out.println("The Author's name is "+author);

        System.out.println("The chapters are ");

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

            System.out.printf("Chapter no %d is : ",(i+1));

            System.out.println(chapters[i]);

        }

    }

        void setValues(String auth,String []chap){

            author = auth;

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

                chapters[i] = chap[i];

        }

    }

        boolean checkAuthorName(){

*if*(author.startsWith("A")){

*return* true;

            }

*else*{

*return* false;

            }

        }

        boolean searchChapter(String chapterName){

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

*if*(chapterName.equalsIgnoreCase(chapters[i])){

*return* true;

                }

            }

*return* false;

        }

    }

Activity – 3

# Source Code:

public class QuadraticEquation {

    double a,b,c;

    QuadraticEquation(){

    }

    QuadraticEquation(double alpha,double beta,double gamma){

        a = alpha;

        b = beta;

        c = gamma;

    }

    void display(){

        System.out.println("The value of a is :"+a);

        System.out.println("The value of b is :"+b);

        System.out.println("The value of c is :"+c);

    }

    void setValues(double alpha,double beta,double gamma){

        a = alpha;

        b = beta;

        c = gamma;

    }

    double discriminant(){

        double disc = (b\*b) - (4\*a\*c);

*return* disc;

    }

    boolean discGreaterThan100(){

        double disc = discriminant();

*if*(disc>100){

*return* true;

        }

*else*{

*return* false;

        }

    }

}

Activity – 4

# Source Code:

public class Rectangle {

    double length , width;

    Rectangle(){

    }

    Rectangle(double l, double w){

        length = l;

        width = w;

    }

    void display(){

        System.out.println("The value of length is"+length);

        System.out.println("The value of width is "+width);

    }

    void setValues(double l, double w){

        length = l;

        width = w;

    }

    double area(){

        double areaCal = (length\*width);

*return* areaCal;

    }

    boolean checkSquare(){

*if* (length== width){

*return* true;

        }

*else* *return* false;

    }

}

Activity – 5

# Source Code:

public class Student {

    String name;

    double gpa;

    String [] subjects = *new* String [5];

    String email;

    Student(){

    }

    Student(String nam, double gp,String[] subj,String emil){

        name = nam;

        gpa = gp;

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

            subjects[i] = subj[i];

        }

        email = emil;

    }

    void setValues(String nam, double gp,String[] subj,String emil){

        name = nam;

        gpa = gp;

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

            subjects[i] = subj[i];

        }

        email = emil;

    }

    void display(){

        System.out.println("The name of Student is :"+name);

        System.out.println("The GPA of Student is :"+gpa);

        System.out.println("The Email Address is :"+email);

        System.out.println("The subjects are ");

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

            System.out.println(subjects[i]);

        }

    }

    boolean searchSubjects(String subjectName){

*for*(int i=0;i<5;i++){

*if*(subjectName.equalsIgnoreCase(subjects[i])){

*return* true;

            }

        }

*return* false;

    }

    boolean checkProbStatus(){

*if*(gpa>=2.0){

*return* false;

        }

*return* true;

    }

    boolean validEmail(){

*if*(email.contains("@")){

*if*(email.contains("gmail") || email.contains("hotmail")){

*if*(email.contains(".com") || email.contains(".org")){

*return* true;

                }

            }

        }

*return* false;

    }

}

Runner Class

# Source Code:

public class Runner{

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

*// \* Account class*

*// Account a1 = new Account();*

*// a1.setValues(2012, 50,"35202-7469818-1");*

*// a1.display();*

*// double paisa = a1.deposit(20);*

*// System.out.println(paisa);*

*// double moneyAfterWithdrawal = a1.withdraw(17);*

*// System.out.println(moneyAfterWithdrawal);*

*// System.out.println(a1.balance);*

*// \* Book Class*

*// Book b1 = new Book();*

*// String [] chapters = {"Research","Ideas","Innovation","Implementation","Modification"};*

*// b1.setValues("Shahzaneer Ahmed",chapters);*

*// System.out.println(b1.author);*

*// b1.display();*

*// \* Rectangle Class*

*// Rectangle r1 = new Rectangle(12, 12);*

*// System.out.println(r1.checkSquare());*

*// r1.display();*

*// System.out.println(r1.area());*

*// \* Quadratic Equation Class*

*// QuadraticEquation q1 = new QuadraticEquation(2,3,4);*

*// System.out.println(q1.discriminant());*

*// q1.display();*

*// System.out.println(q1.discGreaterThan100());*

*// \* Student Class*

        Student s1 = *new* Student();

        String [] courses = {"ICT","PF","DSA","OOP","Database-1"};

        s1.setValues("Eman",3.3,courses,"emann01@gmail.com");

        System.out.println(s1.checkProbStatus());

        s1.display();

        System.out.println(s1.validEmail());

    }

}