**Task 01**

**CODE**

import java.util.ArrayList;

import java.util.Scanner;

public class CyberSecurityFramework{

    public static void main(String[] args) {

        System.out.println("\n---------------Shah Hunain (23k-3032)---------------");

        Scanner obj = new Scanner(System.in);

        System.out.println("Enter the Security Level: ");

        String securityLevel = obj.nextLine();

    if(securityLevel.equals("High") || securityLevel.equals("Low") || securityLevel.equals("Medium")){

        System.out.println("Enter the number of devices: ");

        int noOfDevices = obj.nextInt();

        if(noOfDevices==10){

            System.out.println("Enter the cost of security tool: ");

            double cost = obj.nextDouble();

            obj.nextLine();

            String n;

            ArrayList<String> protocol = new ArrayList<>();

            System.out.println("Enter the Protocol List: ");

            for(int i=0; i<=5; i++){

                System.out.println("Enter for "+(i+1));

                n=obj.nextLine();

                if(n.equals("HTTPS") || n.equals("FTP") || n.equals("UDP")  || n.equals("ICMP")  || n.equals("SSH")  || n.equals("SNMP")){

                    protocol.add(n);

                }

                else{

                    System.out.println(""+n+" not matched protocol");

                }

            }

            System.out.println("Enter a digit from your ID: ");

            String id =obj.nextLine();

            int d = id.charAt(0) - '0';

            ArrayList<Integer> port = new ArrayList<>();

            System.out.println("\nThe digit is "+d);

            for(int i=1 ; i<=23; i++){

                port.add(d+i);

            }

            FirewallTool f = new FirewallTool(securityLevel, cost, noOfDevices);

                f.setProtocolsList(protocol);

                f.generatePortLists(port);

                f.performScan();

            }

            else{

                System.out.println("No of possible devices exceed from 10");

            }

        }

        else{

            System.out.println("Invalid scurity level");

        }

    }

}

public class CyberSecurityTool {

    protected String securityLevel;

    protected double cost;

    protected int noOfDevices;

    CyberSecurityTool(){

    }

    CyberSecurityTool(String securityLevel, double cost, int noOfDevices){

        /\*

        if(securityLevel.equals("High") || securityLevel.equals("Low") || securityLevel.equals("Medium")){

            this.securityLevel=securityLevel;

        }

        if(cost>0.0){

            this.cost=cost;

        }

        if(noOfDevices==10){

            this.noOfDevices=noOfDevices;

        }

        \*/

        this.securityLevel=securityLevel;

        this.cost=cost;

        this.noOfDevices=noOfDevices;

    }

    public void performScan(){

        System.out.println("\t\nA generic security scan");

    }

}

import java.util.ArrayList;

public class FirewallTool extends CyberSecurityTool{

    private ArrayList<Integer> port;

    private ArrayList<String> protocols;

    FirewallTool(){

    }

    FirewallTool(String securityLevel, double cost, int noOfDevices){

        super(securityLevel, cost, noOfDevices);

    }

    public void setProtocolsList(ArrayList<String> protocols){

        this.protocols=protocols;

    }

    public void generatePortLists(ArrayList<Integer> port){

        this.port=port;

    }

    public void performScan(){

        if(super.securityLevel.equals("High")){

            System.out.println("For "+super.securityLevel+" the following protocol list and traffic from port is allowed");

            System.out.println("PROTOCOL:");

            for(String element: protocols){

                System.out.println(element);

            }

            System.out.println("PORT LIST:");

            for(int i: port){

                System.out.println(i);

            }

        }

        if(super.securityLevel.equals("Medium")){

            System.out.println("For "+super.securityLevel+" the following protocol list and traffic from port (with 2 more) is allowed");

            System.out.println("PROTOCOL:");

            for(String element: protocols){

                System.out.println(element);

            }

            port.add(port.get(port.size()-1)+1);

            port.add(port.get(port.size()-1)+1);

            System.out.println("PORT LIST:");

            for(int i: port){

                System.out.println(i);

            }

        }

        if(super.securityLevel.equals("Low")){

            System.out.println("For "+super.securityLevel+" the following protocol list (with 2 more) and traffic from port (with 5 more) is allowed");

            protocols.add("TCP");

            protocols.add("DNS");

            System.out.println("PROTOCOL:");

            for(String element: protocols){

                System.out.println(element);

            }

            for(int j=1; j<=5; j++){

                port.add(port.get(port.size()-1)+1);

            }

            System.out.println("PORT LIST:");

            for(int i: port){

                System.out.println(i);

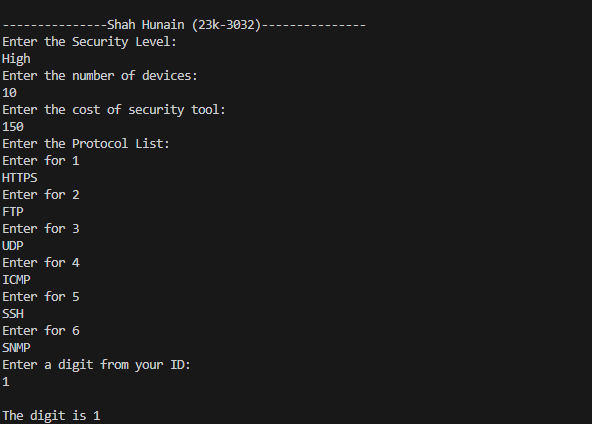
            }

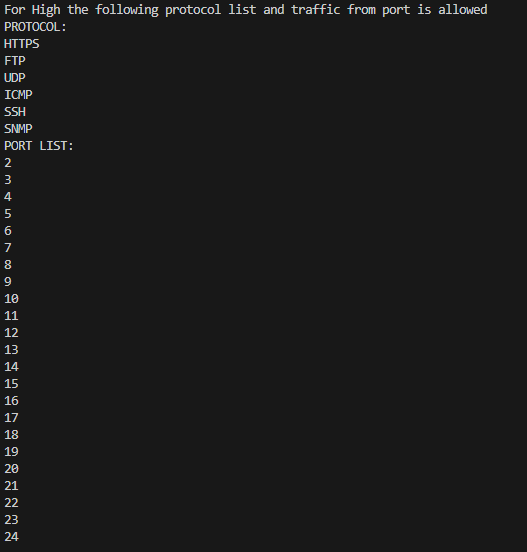
        }

    }

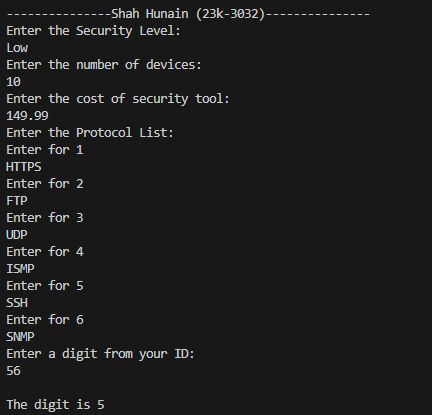
}

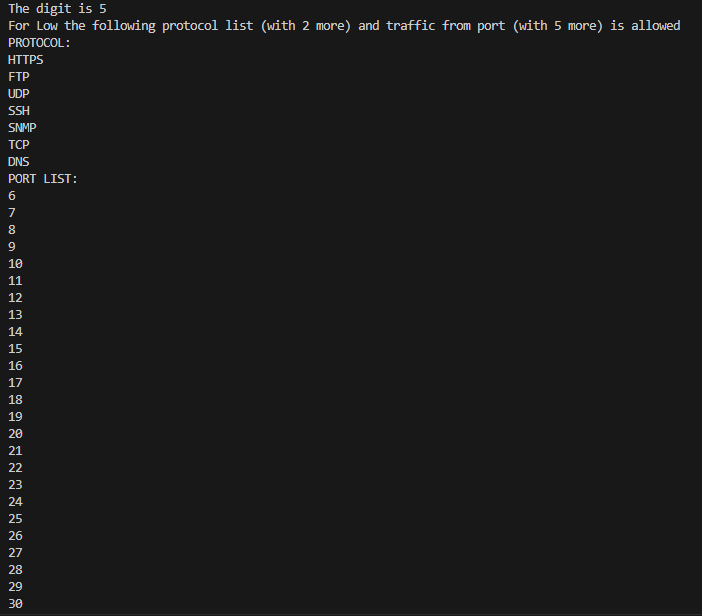
**OUTPUT**

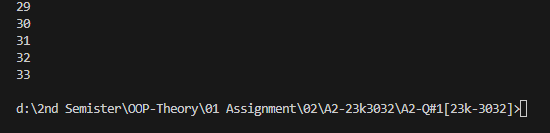




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**Task 02**

**CODE**

import java.util.ArrayList;

import java.util.Scanner;

public class GamingEnvironment{

    public static void main(String[] args) {

        System.out.println("\n---------------Shah Hunain (23k-3032)---------------");

        Scanner obj = new Scanner(System.in);

            ArrayList<String> weapons = new ArrayList<>();

            System.out.println("Enter the weapons");

            for(int i=0; ; i++){

                if(i>4){

                    System.out.println("You want to enter more?\nY=YES\t\tN=NO");

                    String choice = obj.nextLine();

                    if(choice.equals("N")){

                        break;

                    }

                }

                System.out.println("Enter weapon "+(i+1));

                String n = obj.nextLine();

                weapons.add(n);

            }

            System.out.println("Enter damage for Enemy (1-10): ");

            int damage = obj.nextInt();

            obj.nextLine();

            if (damage<1 || damage>10){

                System.out.println("Invalid Damage value");

                damage=5;     //Sett to default

            }

            Player p = new Player(1, "Avenger");

            Weapons w = new Weapons(weapons);

            Character c = new Character();

            Enemy e = new Enemy(damage);

            for (int i = 0; i<3; i++){

                System.out.println("Experience level: "+c.experience);

                c.playGame(w,e);

                System.out.println("Experience Updated to "+c.experience);

            }

            System.out.println("Player ID: "+p.playerId+"\nPlayer Name: "+p.playerName);

            System.out.println("Final Experience level: "+c.experience);

    }

}

import java.util.ArrayList;

import java.util.Scanner;

public class Weapons {

    protected ArrayList<String> weaponsList;

    Weapons(ArrayList<String> weaponsList){

        this.weaponsList=weaponsList;

    }

    Scanner obj = new Scanner(System.in);

    int j;

    public void use(){

        j=0;       //To check found or not

        System.out.println("Enter the weapon you want to use: ");

        String n = obj.nextLine();

        for(String element: weaponsList){

            if(n.equals(element)){

                System.out.println();

                j=1;     //If found

            }

        }

        if(j==0){

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

        }

    }

}

public class Player {

    protected int playerId;

    protected String playerName;

    protected int health;

    Player(){

    }

    Player(int playerId, String playerName){

        this.playerId=playerId;

        this.playerName=playerName;

        this.health=100;

    }

}

import java.util.Scanner;

public class Character extends Player {

    protected int level;

    protected String experience;

    protected int points;

    Character(){

        super();

        this.level=0;

        this.points=0;

        this.experience="Beginner";

    }

    Character(int level, String experience, int points){

        this.level=level;

        this.experience=experience;

        this.points=points;

    }

    Scanner obj = new Scanner(System.in);

    public void levelUp(){

        System.out.println(experience+" experience");

        System.out.println(points+" points");

            if(this.experience.equals("Beginner")){

                this.experience="Intermediate";

            }

            else if(this.experience.equals("Intermediate")){

                this.experience="Advanced";

            }

            else if(this.experience.equals("Advanced")){

                this.experience="Expert";

            }

    }

    public void playGame(Weapons weapons, Enemy enemy){

        weapons.use();

        if(weapons.j==1){

            System.out.println("Attack?\n1=Yes\t2=No");

            int choice = obj.nextInt();

            obj.nextLine();

            if(choice==1){

                System.out.println("ATTACK DONE");

                enemy.health=enemy.health-5;

                points=points+10;

                levelUp();

            }

        }

    }

}

import java.util.Scanner;

public class Enemy extends Player{

    protected int damage;

    Enemy(){

        super();

    }

    Enemy(int damage){

        this.damage=damage;

    }

    Scanner obj = new Scanner(System.in);

    public void attack(Weapons weapons){

        weapons.use();

        if(weapons.j==1){

            System.out.println("Enemy Attacks");

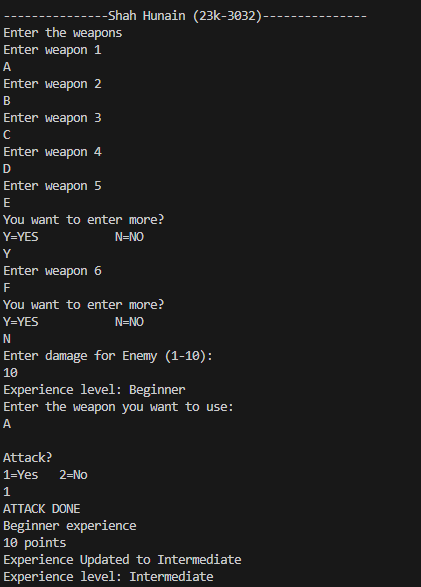
            health=health-this.damage;

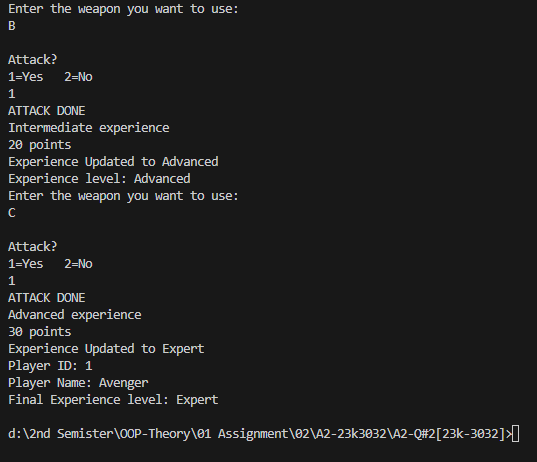
        }

    }

}

**OUTPUT**





**Task 03**

**CODE**

import java.util.Scanner;

public class DarazLoyaltyProgramSystem{

    public static void main(String[] args){

System.out.println("\n---------------Shah Hunain (23k-3032)---------------");

        Scanner obj = new Scanner(System.in);

        System.out.println("Enter the customer number: ");

        int customerNumber = obj.nextInt();

        obj.nextLine();

        if (customerNumber>0){

            System.out.println("Enter loyalty points: ");

            int loyaltyPoints = obj.nextInt();

            obj.nextLine();

            if (loyaltyPoints>0){

                DarazPersonData dpd = new DarazPersonData();

                dpd.setFirstName("Shah");

                dpd.setLastName("Hunain");

                dpd.setAddress("House No. R#133 Block 'A' Malir 15");

                dpd.setCity("Karachi");

                dpd.setState("Pakistan");

                dpd.setZip("70173");

                dpd.setPhone("0123456789");

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

                System.out.println("Address: "+dpd.getAddress());

                System.out.println("City: "+dpd.getCity());

                System.out.println("State: "+dpd.getState());

                System.out.println("Zip: "+dpd.getZip());

                System.out.println("Phone: "+dpd.getPhone());

                DarazLoyaltyProgram dlp = new DarazLoyaltyProgram(loyaltyPoints);

                dlp.setCustomerNumber(customerNumber);

                System.out.println("Customer Number: " + dlp.getCustomerNumber());

                dlp.addLoyaltyPoints();

                dlp.displayTotalLoyaltyPoints();

                dlp.redeemLoyaltyPoints();

            }

            else{

                System.out.println("Invalid loyalty points");

            }

        }

        else{

            System.out.println("Invalid customer number");

        }

        obj.close();

    }

}

public class DarazPersonData{

    private String firstName;

    private String lastName;

    private String address;

    private String city;

    private String state;

    private String zip;

    private String phone;

    public void setFirstName(String fName){

        this.firstName=fName;

    }

    public void setLastName(String lName){

        this.lastName=lName;

    }

    public void setAddress(String address){

        this.address=address;

    }

    public void setCity(String city){

        this.city=city;

    }

    public void setState(String state){

        this.state=state;

    }

    public void setZip(String zip){

        this.zip=zip;

    }

    public void setPhone(String phone){

        this.phone=phone;

    }

    public String getName(){

        return this.firstName + " " + this.lastName;

    }

    public String getAddress(){

        return this.address;

    }

    public String getCity(){

        return this.city;

    }

    public String getState(){

        return this.state;

    }

    public String getZip(){

        return this.zip;

    }

    public String getPhone(){

        return this.phone;

    }

}

public class DarazCustomerData {

    private static int customerNumberCounter=0;

    private int customerNumber;

    private int loyaltyPoints;

    public DarazCustomerData(){

        this.customerNumber = ++customerNumberCounter;

    }

    public DarazCustomerData(int loyaltyPoints){

        this.customerNumber=++customerNumberCounter;

        this.loyaltyPoints=loyaltyPoints;

    }

    public int getCustomerNumber(){

        return this.customerNumber;

    }

    public void setCustomerNumber(int customerNumber){

        if(customerNumber>0){

            this.customerNumber=customerNumber;

        }

        else{

            System.out.println("Invalid customer number");

        }

    }

    public int getLoyaltyPoints(){

        return this.loyaltyPoints;

    }

    public void setLoyaltyPoints(int loyaltyPoints){

        if(loyaltyPoints>0){

            this.loyaltyPoints = this.loyaltyPoints+loyaltyPoints;

        }

        else{

            System.out.println("Invalid loyalty points");

        }

    }

}

import java.util.Scanner;

public class DarazLoyaltyProgram extends DarazCustomerData{

    public DarazLoyaltyProgram(){

        super();

    }

    public DarazLoyaltyProgram(int loyaltyPoints){

        super(loyaltyPoints);

    }

    Scanner obj = new Scanner(System.in);

    public void addLoyaltyPoints(){

        System.out.println("\n\t10 points for each purchase");

        System.out.println("Please enter the number of purchases made");

        int n=obj.nextInt();

        if (n>0){

            setLoyaltyPoints(n\*10);

        }

        else{

            System.out.println("Invalid number of purchases");

        }

    }

    public void displayTotalLoyaltyPoints(){

        System.out.println("The total loyalty points are: "+super.getLoyaltyPoints());

    }

    public void redeemLoyaltyPoints(){

        int discount=5;

        if (super.getLoyaltyPoints()>0) {

            if (super.getLoyaltyPoints()<10){

                System.out.println("For " + super.getLoyaltyPoints() + " you earned a discount of 5%");

            }

            else if(super.getLoyaltyPoints()>=10 && super.getLoyaltyPoints()<20) {

                discount=10;

                System.out.println("For "+super.getLoyaltyPoints()+" you earned a discount of "+discount+"%");

            }

            else if(super.getLoyaltyPoints()>=20){

                discount=15;

                System.out.println("For "+super.getLoyaltyPoints()+" you earned a discount of "+discount + "%");

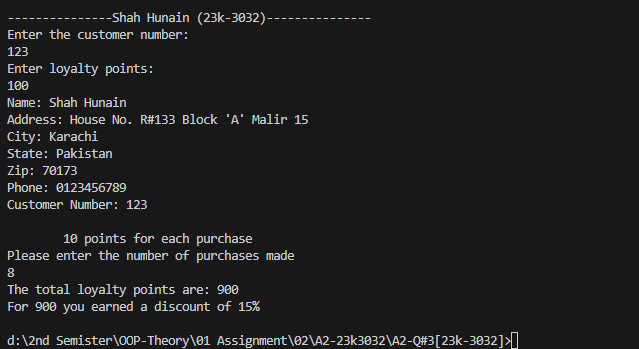
            }

        }

    }

}

**OUTPUT**



**Task 04**

**CODE**

public class SocialMediaApp{

    public static void main(String[] args){

        System.out.println("\n---------------Shah Hunain (23k-3032)---------------");

        RegularUser ru = new RegularUser("Shah Hunain", "shahhunainjee@gmail.com", "passGood");

        BusinessUser bu = new BusinessUser("Ahmed", "ahmedShah@gmail.com", "QWERTYqwerty");

        Post p1 = new Post("001", "Friendly", 100, 8);

        Post p2 = new Post("002", "Family", 150, 9);

        Post p3 = new Post("003", "Entertainment", 200, 15);

        ru.addPost("Post 1");

        ru.addPost("Post 2");

        ru.addPost("Post 3");

        ru.viewFeed();

        bu.promotePost(p1.content);

        bu.promotePost(p2.content);

        bu.promotePost(p3.content);

        p1.displayPostDetails("001");

        p2.displayPostDetails("002");

        p3.displayPostDetails("003");

    }

}

import java.util.Scanner;

public class User {

    private String userName;

    private String email;

    private String password;

    User(){

        this.userName="null";

        this.email="null";

        this.password="null";

    }

    User(String userName, String email, String password){

        this.userName=userName;

        this.email=email;

        setPassword(password);

    }

    Scanner obj = new Scanner(System.in);

    public void userVerification(){

        System.out.println("Enter User Name: ");

        String n = obj.nextLine();

        if(n.compareTo(this.userName)==0){

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

            String email= obj.nextLine();

            if(email.compareTo(this.email)==0){

                System.out.println("Verification Completed!");

            }

            else{

                System.out.println("Incorrect Email!");

            }

        }

        else{

            System.out.println("Incorrect User Name!");

        }

    }

    public void setPassword(String password){

        this.password=password;

        passwordEncryption();

    }

    public String getPassword(){

        return this.password;

    }

    private void passwordEncryption(){

        this.password="abcd"+this.password+"123";

        System.out.println(this.password);

    }

}

import java.util.ArrayList;

public class RegularUser extends User{

    private static final int maxPosts=5;

    private ArrayList<String> posts;

    RegularUser(){

        super();

        this.posts=new ArrayList<>();

    }

    RegularUser(String userName, String email, String password){

        super(userName,email,password);

        this.posts=new ArrayList<>();

    }

    public void addPost(String post) {

        if (posts.size()<maxPosts) {

            posts.add(post);

            System.out.println("Post added successfully!");

        }

        else{

            System.out.println("Maximum post limit reached!");

        }

    }

    public void viewFeed() {

        System.out.println("Posts by Regular User:");

        for (String post : posts) {

            System.out.println(post);

        }

    }

}

public class BusinessUser extends User{

    private static final int promotionLimit=10;

    private int promotionCount;

    BusinessUser(){

        super();

        this.promotionCount=0;

    }

    BusinessUser(String userName, String email, String password){

        super(userName,email,password);

        this.promotionCount=0;

    }

    public void promotePost(String post) {

        if (promotionCount<promotionLimit){

            System.out.println("Post \"" + post + "\" has been promoted.");

            promotionCount++;

        }

        else{

            System.out.println("Promotion limit reached!");

        }

    }

}

import java.util.ArrayList;

import java.util.Scanner;

public class Post {

    protected String postId;

    protected String content;

    protected int views;

    protected int likes;

    protected ArrayList<String> comments;

    Post(String postId, String content, int views, int likes){

        this.postId = postId;

        this.content = content;

        this.views = views;

        this.likes = likes;

        this.comments = new ArrayList<>();

    }

    Scanner obj = new Scanner(System.in);

    public void addComment(){

        System.out.println("Enter the post ID to which you want to add comment: ");

        String id = obj.nextLine();

        if(id.equals(postId)){

            System.out.println("Write your comment: ");

            String comment = obj.nextLine();

            comments.add(comment);

        }

        else{

            System.out.println("Post ID match not found");

        }

    }

    public void likePost(){

        System.out.println("Enter the post ID you want to like: ");

        String id = obj.nextLine();

        if(id.equals(postId)){

            this.likes++;

        }

        else{

            System.out.println("Post ID match not found");

        }

    }

    public void displayPostDetails(String id){

        if(this.postId.equals(id)){

            System.out.println("Post ID: "+this.postId);

            System.out.println("Content: "+this.content);

            System.out.println("Views: "+this.views);

            System.out.println("Likes: "+this.likes);

            System.out.println("Comments: ");

            if (comments != null) { // Check if comments is not null before iterating

                for(String element: comments){

                    System.out.println(element);

                }

            }

        }

        else{

            System.out.println("Post ID match not found");

        }

    }

}

**OUTPUT**

