AIM:	To solve problems on Interfaces
Program 1	

PROBLEM STATEMENT:	Write a program that plays the game of hangman. In hangman, the computer begins by selecting a secret word at random from a list of possibilities. It then prints out a row of dashes—one for each letter in the secret word—and asks the user to guess a letter. If the user guesses a letter that appears in the word, the word is redisplayed with all instances of that letter shown in the correct positions, along with any letters guessed correctly on previous turns. If the letter does not appear in the word, the player is charged with an incorrect guess. The player keeps guessing letters until either (1) the player has correctly guessed all the letters in the word or (2) the player has made eight incorrect guesses. To separate the process of choosing a secret word from the rest of the game, define and implement an interface called randword that exports two functions: InitDictionary and ChooseRandomWord. InitDictionary has a list of words, stored into an array declared as a static global variable in the implementation. ChooseRandomWord takes no arguments and returns a word chosen at random from the internally maintained array.
	
	A sample run of the hangman program is shown as below
	
	`Welcome to Hangman!`
	`I will guess a secret word. On each turn, you guess`
	`a letter. If the letter is in the secret word, I`
	`will show you where it appears; if not, a part of`
	`your body gets strung up on the scaffold. The`
	`object is to guess the word before you are hung.`
	`The word now looks like this: --------`
	`You have 8 guesses left.`
	`Guess a letter: E`
	`That guess is correct.`
	`The word now looks like this: ------E-`
	`You have 8 guesses left.`
	`Guess a letter: A`
	`There are no A's in the word.`
	`The word now looks like this: ------E-`
	`You have 7 guesses left.`
	`Guess a letter: I`
	`There are no I's in the word.`
	`The word now looks like this: ------E-`
	`You have 6 guesses left.`
	`Guess a letter: O`
	`That guess is correct.`
	`The word now looks like this: -O----E-`
	`You have 6 guesses left.`
	`Guess a letter: S`
	`There are no S's in the word.`
	`The word now looks like this: -O----E-`
	`You have 5 guesses left.`
	`Guess a letter: T`
	`That guess is correct.`
	`The word now looks like this: -O---TE-`
	`You have 5 guesses left.`
	`Guess a letter: R`
	`That guess is correct.`
	`The word now looks like this: -O---TER`
	`You have 5 guesses left.`
	`Guess a letter: N`
	`There are no N's in the word.`
	`The word now looks like this: -O---TER`
	`You have 4 guesses left.`
	`Guess a letter: P`
	`That guess is correct.`
	`The word now looks like this: -O-P-TER`
	`You have 4 guesses left.`
	`Guess a letter: C`
	`That guess is correct.`
	`The word now looks like this: CO-P-TER`
	`You have 4 guesses left.`
	`Guess a letter: M`
	`That guess is correct.`
	`The word now looks like this: COMP-TER`
	`You have 4 guesses left.`
	`Guess a letter: U`
	`That guess is correct.`
	`You guessed the word: COMPUTER`
	`You win.`

PROGRAM:	import java.util.*;
	public class Main
	{
	public static void main (String[] args) {
	Scanner sc=new Scanner(System.in);

```
        System.out.println(" _                                    \n" +
                "| |                                   \n" +
                "| |__   __ _ _ __   __ _ _ __ ___   __ _ _ __  \n" +
                "| '_ \\ / _` | '_ \\ / _` | '_ ` _ \\ / _` | '_ \\ \n" +
                "| | | | (_| | | | | (_| | | | | | | (_| | | | |\n" +
                "|_| |_|\\__,_|_| |_|\\__, |_| |_| |_|\\__,_|_| |_|\n" +
                "                    __/ |                    \n" +
                "                   |___/    ");
        System.out.println("tumhara aadmi humare kabze mein hai, usse chudane ke liye saamne wala shabd ka anuman lagayiye \nTumhare paas chhah chances hai, ho sake toh sahi guess karke chudda do ");
        working p1=new working();
        String bollywood=p1.ChooseRandomWords();
        char[] letter= new char[bollywood.length()];
        hangman_art h1=new hangman_art();
        for (int i=0;i<bollywood.length();i++){
            if (bollywood.charAt(i) == 'a' ||bollywood.charAt(i) == 'e' ||bollywood.charAt(i) == 'i' || bollywood.charAt(i)== 'o' || bollywood.charAt(i) == 'u'||bollywood.charAt(i) == 'A' ||bollywood.charAt(i)== 'E' ||bollywood.charAt(i) == 'I' || bollywood.charAt(i) == 'O' || bollywood.charAt(i)== 'U'||bollywood.charAt(i)==' '){
                letter[i]=bollywood.charAt(i);
            }
            else{
                letter[i]='_';
            }
        }
        System.out.println("Yeh raha aapka shabd: ");
        int guess=6;
        for (int j=0;j<bollywood.length();j++){
            while(letter[j]=='_' && guess>=0){
                for (int i=0;i<bollywood.length();i++){
                    System.out.print(letter[i]+" ");
                }
                System.out.println();
                char c = sc.next().charAt(0);
                boolean guesses=false;
                for(int i=0;i<bollywood.length();i++){
                    if(bollywood.charAt(i)==c){
                        letter[i]=c;
                        guesses=true;
                    }
                }
                if (guesses==false){
                    System.out.println(h1.art[6-guess]);
```

```
                guess--;
            }
        }
    }
    boolean win=true;
    for(int i=0;i<bollywood.length();i++){
        if(letter[i]=='_'){
            win=false;
        }
    }
    if(win) {

        System.out.println("  __    __                                __     __                \n" +
                "/\\ \\  /\\ \\                        /\\ \\  __/\\ \\    __           \n" +
                "\\ `\\`\\\\/'/  ___    ___  __           \\ \\ \\/\\ \\ \\ \\ \\  /\\_\\     ___    \n" +
                " `\\ `\\ /'  / __`\\ /\\ \\/\\ \\           \\ \\ \\ \\ \\ \\ \\ \\/\\ \\  /' _ `\\  \n" +
                "   `\\ \\ \\ /\\ \\L\\ \\ \\ \\_\\ \\           \\ \\ \\_/ \\_\\ \\ \\ \\ \\ /\\ \\/\\ \\ \n" +
                "     \\ \\_\\ \\ \\____/\\ \\____/            \\ `\\___x___/  \\ \\_\\ \\_\\ \\_\\\n" +
                "      \\/_/ \\/___/  \\/___/              '\\/__//__/    \\/_/ \\/_/\\/_/\n" +
                "                                                    ");
        System.out.println("You have saved the man. The movie was "+bollywood);
        System.out.println("Feedback: ");
        System.out.print("*****************Kya Gunda Banega Re
Tu*****************");
    }
    else{
        System.out.println(" .----------------.  .----------------.  .----------------.  .----------------.
\n" +
                "| .--------------. || .--------------. || .--------------. || .--------------. |\n" +
                "| | ____________ | || | ____________ | || |     __     | || | ____________ | |\n" +
                "| | |_   ____ `. | || | |_   ____ | | || |    /  \\    | || | |_   ____ `. | |\n" +
                "| | |   | |   `. \\ | || |   | |_  \\_| | || |   / /\\ \\   | || |   | |   `. \\ | |\n" +
                "| |   | |    | | || |   |  _|  _      | || |  / ____ \\  | || |   | |    | | | |\n" +
                "| |  _| |___.' / | || |  _| |___/ |  | || | _/ /    \\ \\_ | || |  _| |___.' / | |\n" +
                "| | |_________.'  | || | |_____|  | || ||_____|  |_____|| || | |_________.'  | |\n" +
                "| |              | || |              | || |              | |\n" +
                "| '--------------' || '--------------' || '--------------' || '--------------' |\n" +
                " '----------------'  '----------------'  '----------------'  '----------------' ");
        System.out.println("Muh se Moongfali toot nahi rahi , Chale hai apna aadmi ko
chudana ka liye");
    }
  }
}
interface ranword{
```

```
   //public void InitDictionary();
   public String ChooseRandomWords();
}
class working implements ranword{
   static String[] words={"Sholay" ,"Mughal e Azam","Mother India" , "Dilwale
Dulhania Le Jayenee" ,"Pyaasa" ,"Guide" , "Deewaar" , "Lagaan" , "Pakeezah", "Amar
Akbar Anthony", "Do Bigha Zamin" ,"Jaane Bhi Do Yaaro" , "3 Idiots" , "Kaagaz Ke
Phool" ,"Bombay" ,"Mr India",
         "Bobby","Satya", "Dil Chahta Hai","Andaz Apna Apna","Dil To Pagal Hai","
Om Shanti Om","Shree 420","Jab We Met","Parinda","Shaan","Zindagi Na Milegi
Dobara"," Silsila ","Anand","Prem Rog",
         "Barfi","Awaara","Golmaal","Ankur","Ek Tha Tiger","Chak De! India","Kaala
Patthar","Ghajini","Jodhaa Akbar","Kabhi Khushi Kabhie Gham" };
   public String ChooseRandomWords(){

      int a= (int)(Math.random()*41);
      return words[a];
   }
}
class hangman_art{
   static String[] art={"  +---+\n" +
         "  |   |\n" +
         "      |\n" +
         "      |\n" +
         "      |\n" +
         "      |\n" +
         "=========","  +---+\n" +
         "  |   |\n" +
         "  O   |\n" +
         "      |\n" +
         "      |\n" +
         "      |\n" +
         "=========","  +---+\n" +
         "  |   |\n" +
         "  O   |\n" +
         "  |   |\n" +
         "      |\n" +
         "      |\n" +
         "=========","  +---+\n" +
         "  |   |\n" +
         "  O   |\n" +
         " /|   |\n" +
         "      |\n" +
         "      |\n" +
```

```
        "==========","  +---+\n" +
        "  |   |\n" +
        "  O   |\n" +
        " /|\\  |\n" +
        "      |\n" +
        "      |\n" +
        "==========","  +---+\n" +
        "  |   |\n" +
        "  O   |\n" +
        " /|\\  |\n" +
        " /    |\n" +
        "      |\n" +
        "==========","  +---+\n" +
        "  |   |\n" +
        "  O   |\n" +
        " /|\\  |\n" +
        " / \\  |\n" +
        "      |\n" +
        "==========";

}
```

RESULT:

```
 _
| |
| |__   __ _ _ __   __ _ _ __ ___   __ _ _ __
| '_ \ / _` | '_ \ / _` | '_ ` _ \ / _` | '_ \
| | | | (_| | | | | (_| | | | | | | (_| | | | |
|_| |_|\__,_|_| |_|\__, |_| |_| |_|\__,_|_| |_|
                    __/ |
                   |___/
tumhara aadmi humare kabze mein hai, usse chudane ke liye saamne wala shabd ka anuman lagayiye
Tumhare paas chhah chances hai, ho sake toh sahi guess karke chudda do
Yeh raha aapka shabd:
_ i _ _ a _ e   _ u _ _ a _ i a   _ e   _ a _ e _ e e
q
  +---+
  |   |
      |
      |
      |
      |
=========
_ i _ _ a _ e   _ u _ _ a _ i a   _ e   _ a _ e _ e e
D
D i _ _ a _ e   D u _ _ a _ i a   _ e   _ a _ e _ e e

l
D i l _ a l e   D u l _ a _ i a   _ e   _ a _ e _ e e
w
D i l w a l e   D u l _ a _ i a   _ e   _ a _ e _ e e
h
D i l w a l e   D u l h a _ i a   _ e   _ a _ e _ e e
L
D i l w a l e   D u l h a _ i a   L e   _ a _ e _ e e
J
D i l w a l e   D u l h a _ i a   L e   J a _ e _ e e
y
D i l w a l e   D u l h a _ i a   L e   J a y e _ e e
q
```

```
  +---+
  |   |
  O   |
      |
      |
      |
=========
D i l w a l e   D u l h a _ i a   L e   J a y e _ e e
q
```

```
  +---+
  |   |
  O   |
  |   |
      |
      |
=========
D i l w a l e   D u l h a _ i a   L e   J a y e _ e e
q
```

```
  +---+
  |   |
  O   |
 /|   |
      |
      |
=========
D i l w a l e   D u l h a _ i a   L e   J a y e _ e e
q
```

```
  +---+
  |   |
  O   |
 /|\  |
      |
      |
=========
D i l w a l e   D u l h a _ i a   L e   J a y e _ e e
q
```

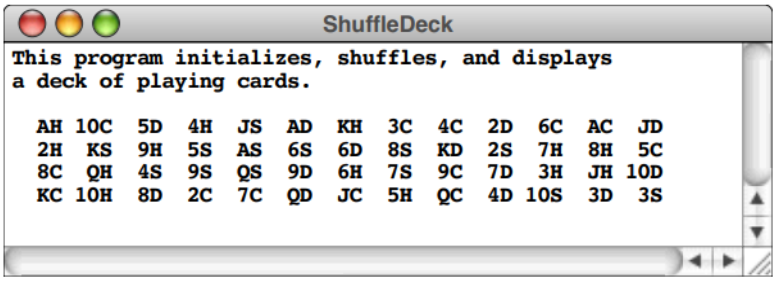
```
  +---+
  |   |
  O   |
 /|\  |
 /    |
      |
=========
```

```
D i l w a l e   D u l h a _ i a   L e   J a y e _ e e
q
```

```
  +---+
  |   |
  O   |
 /|\  |
 / \  |
      |
=========
```

```
 .----------------.  .----------------.  .----------------.  .----------------.
| .--------------. || .--------------. || .--------------. || .--------------. |
| |  _______     | || |  _________   | || |      __      | || |  _______     | |
| | |_   __ \.   | || | |_   ___  |  | || |     / \     | || | |_   __ \.   | |
| |   | |__) \ \  | || |   | |_  \_|  | || |    / /\ \    | || |   | |__) \ \  | |
| |   |  ___.\ \ | || |   |  _|  _   | || |   / ____ \   | || |   |  ___.\ \ | |
| |  _| |___.' / | || |  _| |___/ |  | || | _/ /    \ \_ | || |  _| |___.' / | |
| | |_______.'  | || | |_________|  | || ||____|  |____|| || | |_______.'  | |
| |              | || |              | || |              | || |              | |
| '--------------' || '--------------' || '--------------' || '--------------' |
 '----------------'  '----------------'  '----------------'  '----------------'
```

Muh se Moongfali toot nahi rahi , Chale hai apna aadmi ko chudana ka liye

Program 2	
PROBLEM STATEMENT :	**Design and implement an interface called card that exports the following interface entries:** **• A interface rankT that allows you to represent the rank of a card. The values of type rankT include the integers between 2 and 10 but should also include the constants Ace, Jack, Queen, and King.** **• A interface suitT consisting of the four suits: Clubs, Diamonds, Hearts, and Spades.** **• A interface cardT that combines a rank and a suit.** **- It has a function NewCard(rank, suit) that creates a cardT from the rank and suit values.** **-Two functions, Rank(card) and Suit(card), that allow the client to select the rank and suit of a cardT value.** **• Class has a function CardName(card) that returns a string identifying the card. The result of CardName begins with a rank indicator (which is one of A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, or K), followed by a one-character suit (C, D, H, or S). Note that the result is usually a two-character string, but contains three characters if the rank is a 10.** **Using the card interface initialize a complete deck of 52 cards, shuffles it, and then displays the shuffled values, as shown in the following sample run** 

PROGRAM:	import java.util.*;
	interface rankT{
	String[] rank={"A","2","3","4","5","6","7","8","9","10","J","Q","K"};
	}
	interface suitT{
	String[] suit={"D","S","H","C"};
	}
	interface cardT{
	void NewCard();
	}
	class PrintCard implements rankT,suitT,cardT{
	ArrayList<String> ll = new ArrayList<String>(52);
	public void NewCard(){
	for(int i=0;i<rank.length;i++){
	for(int j=0;j<suit.length;j++){
	ll.add(rank[i]+suit[j]);

```
            }
        }
        //System.out.println(ll);
    }
    public void ShuffleCard(){
        Collections.shuffle(ll);
    }
    void display(){
        //System.out.println(ll.size());
        for(int i=0;i<ll.size();i++){
            if(i%13==0){
                System.out.println();
            }
            System.out.print("\t"+ll.get(i));
        }
    }

}
public class Card {
    public static void main(String[] args) {
        PrintCard p=new PrintCard();
        p.NewCard();
        p.ShuffleCard();
        p.display();
    }
}
```

RESULT:

```
2C  JH  10S 4H  5H  3H  6D  6C  KH  9H  JC  AS  7C
10C 8H  2S  5C  AC  5S  KD  7H  KC  JD  3D  7D  9D
JS  AD  8D  9S  6H  2D  3C  2H  QD  8C  5D  QH  7S
QS  QC  4D  AH  10D 3S  KS  9C  4S  10H 8S  4C  6S
```

CONCLUSION:	We learned about Interface and designed hangman game using Interface and the shuffled a deck of cards using interfaces