**TASK – 1**

**NUMBER GAME**

**1. Generate a random number within a specified range, such as 1 to 100.**

**2. Prompt the user to enter their guess for the generated number.**

**3. Compare the user's guess with the generated number and provide feedback on whether the guessis correct, too high, or too low.**

**4. Repeat steps 2 and 3 until the user guesses the correct number. You can incorporate additional details as follows:**

**5. Limit the number of attempts the user has to guess the number.**

**6. Add the option for multiple rounds, allowing the user to play again.**

**7. Display the user's score, which can be based on the number of attempts taken or rounds won.**

**Introduction:-**

The **Number Guessing Game** is a simple yet engaging application that challenges players to guess a randomly generated number within a specified range. Designed as an interactive console-based game, it combines elements of logic, probability, and entertainment. Players receive feedback after each guess, indicating whether their guess is too high, too low, or correct, fostering a dynamic and intuitive experience.

This game is not only fun but also educational, as it demonstrates fundamental programming concepts such as random number generation, conditional statements, loops, and user interaction. To maintain excitement and competitiveness, the game incorporates several features, including limited attempts to guess the number, a scoring system based on performance, and the option to play multiple rounds.

**Code:-**

import java.util.Random;

import java.util.Scanner;

public class NumberGame {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        Random random = new Random();

        int score = 0;

        boolean playAgain = true;

        System.out.println("Welcome to the Number Guessing Game!");

        while (playAgain) {

            System.out.println("\nLet's Start the Game!");

            int numberToGuess = random.nextInt(100) + 1;

            int attempts = 0;

            final int MAX\_ATTEMPTS = 5;

            boolean guessedCorrectly = false;

            System.out.println("Guess the number (between 1 and 100). You have " + MAX\_ATTEMPTS + " attempts.");

            while (attempts < MAX\_ATTEMPTS) {

                System.out.print("Attempt " + (attempts + 1) + "/" + MAX\_ATTEMPTS + ": Your guess: ");

                int userGuess;

                try {

                    userGuess = scanner.nextInt();

                } catch (Exception e) {

                    System.out.println("Invalid input! Please enter a number between 1 to 100.");

                    scanner.next();

                    continue;

                }

                attempts++;

                if (userGuess == numberToGuess) {

                    System.out.println("Congratulations! You guessed the number in " + attempts + " attempts.");

                    score++;

                    guessedCorrectly = true;

                    break;

                } else if (userGuess < numberToGuess) {

                    System.out.println("Too low! Try again.");

                } else {

                    System.out.println("Too high! Try again.");

                }

            }

            if (!guessedCorrectly) {

                System.out.println("You've run out of attempts! The correct number was " + numberToGuess + ".");

            }

            System.out.print("\nDo you want to play another round? (yes/no): ");

            scanner.nextLine();

            String response = scanner.nextLine().trim().toLowerCase();

            playAgain = response.equals("yes") || response.equals("y");

        }

        System.out.println("Game over! Your total score: " + score);

        System.out.println("Thanks for playing!");

        scanner.close();

    }

}

**Code Explanation:-**

1. **Importing Required Libraries**

**Random:** Used to generate a random number for the user to guess.

**Scanner:** Used to take user input.

1. **Initialization**

**Scanner:** To read user input

**Random:** To generate random numbers.

**score:** Tracks the user's total score.

**playAgain:** Boolean flag to control whether the user wants to continue playing.

1. **Game Loop**

**while (playAgain):** Main game loop that continues as long as the user wants to play.

**numberToGuess:** Generates the random number for the current round.

**attempts:** Tracks the number of attempts the user has made in the round.

**MAX\_ATTEMPTS:** Sets the maximum attempts allowed per round to 5.

**guessedCorrectly:** Tracks whether the user guessed the number correctly in the round.

1. **User Guessing Loop**

**while (attempts < MAX\_ATTEMPTS):** Loop for the user to make guesses within the allowed attempts.

**scanner.nextInt():** Reads the user's guess.

**try-catch:** Handles invalid input, ensuring the game doesn’t crash if the user enters non-numeric values.

1. **Feedback and Scoring**

* If the user’s guess is correct:
  + The program congratulates them, increments their score, and exits the guessing loop.
* If the guess is too low or too high, feedback is provided, and the user is prompted to guess again.

1. **Handling Round End**

* If the user fails to guess the number within the allowed attempts, the correct number is revealed.
* The user is asked if they want to play another round. The program continues if they respond with "yes" or "y".

1. **Game Over**

* When the user chooses not to play another round, the game ends.
* The total score is displayed, and resources are closed.

**Output:-**

Welcome to the Number Guessing Game!

Let's Start the Game!

Guess the number (between 1 and 100). You have 5 attempts.

Attempt 1/5: Your guess: 50

Too low! Try again.

Attempt 2/5: Your guess: 75

Too high! Try again.

Attempt 3/5: Your guess: 60

Congratulations! You guessed the number in 3 attempts.

Do you want to play another round? (yes/no): yes

Let's Start the Game!

Guess the number (between 1 and 100). You have 5 attempts.

Attempt 1/5: Your guess: 30

Too high! Try again.

Attempt 2/5: Your guess: 15

Too low! Try again.

Attempt 3/5: Your guess: 20

Too low! Try again.

Attempt 4/5: Your guess: 25

Too high! Try again.

Attempt 5/5: Your guess: 23

You've run out of attempts! The correct number was 24.

Do you want to play another round? (yes/no): no

Game over! Your total score: 1

Thanks for playing!