OOP LAB PROJECT REPORT:

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PROJECT: NUMBER GUESS GAME

EXPLANATION:

Game class: Represents the logic of the number guessing game.

Fields:

* Secret Number: Stores the randomly generated secret number.
* attempts: Counts the number of guesses made by the player in each game session.
* best Score: Keeps track of the fewest number of attempts it took to guess the number correctly across multiple games.
* Constructor (Game ()): Initializes best Score to Integer.MAX\_VALUE, which acts as an initial placeholder for the best score until a valid game is played.
* Method generateRandomNumber(int range): Uses Random class to generate a random number between 1 and range.
* Method play (int range): Controls the main game loop. Initializes a new game with a random secret number within the specified range. Accepts user input for guesses, validates input, and provides feedback on whether the guess is too high or too low. Provides hints after 5 unsuccessful attempts (whether the secret number is even or odd). Updates best Score if the current game's attempts are fewer than the previously recorded best score.
* Method getBestScore(): Returns the best score achieved across all game sessions. Method playAgain(): Prompts the player to decide whether to play another round. Returns true if the player wants to continue playing, otherwise false.
* Explanation:
* Main class: Handles the interaction with the player and manages game sessions.
* Method main(String[] args): Creates an instance of Game. Uses a Scanner to get player input. Provides a menu for difficulty levels (ranges). Based on player choice, sets the range for the game (easy, medium, or hard). Calls game.play(range) to start a game session with the chosen range. After each game, checks if the player wants to play again using game.playAgain(). If the player chooses not to play again, exits the loop and displays the best score achieved during the session.

Summary:

This program implements a simple number guessing game where the player selects a difficulty level, guesses the randomly generated secret number within the specified range, receives feedback on each guess, and is given the option to play again after each game session. It also tracks and displays the best score achieved across multiple game sessions.

CODE:

import java.util.Random;

import java.util.Scanner;

class Game {

private int secretNumber;

private int attempts;

private int bestScore;

public Game() {

this.bestScore = Integer.MAX\_VALUE; // Initialize bestScore to a high value

}

private int generateRandomNumber(int range) {

Random random = new Random();

return random.nextInt(range) + 1; // generate a random number between 1 and the given range

}

public void play(int range) {

this.secretNumber = generateRandomNumber(range);

this.attempts = 0;

Scanner scanner = new Scanner(System.in);

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

System.out.println("-----------------------------");

System.out.println("I'm thinking of a number between 1 and " + range + ".");

System.out.println("--------------------------------------------");

while (true) {

System.out.print("Enter your guess: ");

while (!scanner.hasNextInt()) {

System.out.print("Please enter a valid number: ");

scanner.next(); // clear the invalid input

}

int guess = scanner.nextInt();

attempts++;

if (guess == secretNumber) {

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

if (attempts < bestScore) {

bestScore = attempts;

System.out.println("New high score! Best score: " + bestScore + " attempts.");

}

break;

} else if (guess < secretNumber) {

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

} else {

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

}

if (attempts == 5) {

System.out.println("Hint: The secret number is " + (secretNumber % 2 == 0 ? "even." : "odd."));

}

}

System.out.println("The secret number was: " + secretNumber);

}

public int getBestScore() {

return bestScore;

}

public boolean playAgain() {

Scanner scanner = new Scanner(System.in);

System.out.print("Do you want to play again? (yes/no): ");

String response = scanner.next().toLowerCase();

return response.equals("yes");

}

}

public class Main {

public static void main(String[] args) {

Game game = new Game();

Scanner scanner = new Scanner(System.in);

while (true) {

System.out.println("Select difficulty level: ");

System.out.println("1. Easy (1-50)");

System.out.println("2. Medium (1-100)");

System.out.println("3. Hard (1-200)");

System.out.print("Enter your choice: ");

int choice = scanner.nextInt();

int range;

switch (choice) {

case 1:

range = 50;

break;

case 2:

range = 100;

break;

case 3:

range = 200;

break;

default:

System.out.println("Invalid choice. Defaulting to Medium (1-100).");

range = 100;

}

game.play(range);

if (!game.playAgain()) {

System.out.println("Thank you for playing! Your best score was " + game.getBestScore() + " attempts.");

break;

}

}

}}

OUTPUT:

Select difficulty level:

1. Easy (1-50)

2. Medium (1-100)

3. Hard (1-200)

Enter your choice: 1

Welcome to Guess the Number!

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I'm thinking of a number between 1 and 50.

--------------------------------------------

Enter your guess: 7

Too low! Try again.

Enter your guess: 18

Too low! Try again.

Enter your guess: 35

Too high! Try again.

Enter your guess: 25

Too low! Try again.

Enter your guess: 30

Too high! Try again.

Hint: The secret number is odd.

Enter your guess:

27

Congratulations! You guessed the number in 6 attempts.

New high score! Best score: 6 attempts.

The secret number was: 27

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

Thank you for playing! Your best score was 6 attempts.

=== Code Execution Successful ===