

Crack the Code

Requirements

For this task, you will need to know what integers, arrays and strings are and how you can use their respective methods. You also need to generate random numbers and read user input (Scanner). You will need to know conditions, operators, loops and what methods are.

Introduction

Welcome to the "Crack the Code" challenge!

In this task, you will use your programming skills to create a game where players must guess a secret code. This exercise will help you practice using loops, conditional statements, and user input handling.

Game Overview

In "Crack the Code," the computer generates a secret code that the player must guess. The code consists of a sequence of numbers. The player has a limited number of attempts to guess the code correctly. After each guess, the computer provides feedback to help the player get closer to the correct answer.

Game Rules

1. **Secret Code:** The computer generates a random sequence of numbers (e.g., a 4-digit code). Each digit can be between 0 and 9.
2. **Player's Guess:** The player inputs their guess for the secret code.
3. **Feedback:** After each guess, the computer provides feedback:
 - **Correct Digit and Position:** If a digit is correct and in the right position, the player is informed.
 - **Correct Digit, Wrong Position:** If a digit is correct but in the wrong position, the player is informed.
 - **Incorrect Digit:** If a digit is not in the code, the player is informed.
4. **(Optional) Attempts:** The player has a limited number of attempts to guess the code correctly.
5. **Winning the Game:** The player wins if they guess the code correctly (within the allowed number of attempts).
6. **(Optional) Losing the Game:** The game ends if the player fails to guess the code within the allowed attempts.

Task

Your task is to implement the "Crack the Code" game. Follow these steps to complete the challenge:

1. **Generate the Secret Code:** Write a method to generate a random sequence of numbers for the secret code.
2. **User Input:** Use a scanner to read the player's guesses from the console.
3. **Provide Feedback:** Implement logic to compare the player's guess to the secret code and provide feedback based on the rules.
4. **Track Attempts:** Keep track of the number of attempts (and end the game if the player exceeds the limit).
5. **Game Loop:** Create a loop that continues until the player guesses the code correctly (or runs out of attempts).
6. **Display Results:** Inform the player if they have won (or lost the game).

Example Round of "Crack the Code"

Game Setup:

- The computer randomly generates a secret code. Let's say the secret code is **247**.

Player's Attempts

Attempt 1:

- Player guesses: **123**
- Feedback:
 - Correct digits but in the wrong position: **1** (the digit 2)

Attempt 2:

- Player guesses: **142**
- Feedback:
 - Correct digits and in the correct position: **1** (the digit 4)
 - Correct digits but in the wrong position: **1** (the digit 2)

Attempt 3:

- Player guesses: **764**
- Feedback:
 - Correct digits and but in the wrong position: **2** (the digit 7 and 4)

Attempt 4:

- Player guesses: **347**
- Feedback:
 - Correct digits and and in the correct position: **2** (the digit 4 and 7)

Attempt 5:

- Player guesses: **247**
- Feedback:
 - You won the game

Additional Challenge

For an extra challenge, you can add features such as:

- Allowing the player to choose the length of the secret code.
- Keeping a record of the player's scores. Return the 10 best scores.
- Adding a difficulty level that adjusts the number of attempts.
- Add an option to make the game easier: If set, the player will see which numbers are correct and in the correct position, which numbers are correct but in the wrong position and which numbers are wrong.

Example (Text based):

"Digit 3 is correct but in the wrong position"

"Digit 5 is correct and in the correct position"

Example (Graphic based):

Yellow = correct, but in the wrong position

Green = correct and in the correct position



- Instead of text-based, make it graphics based.
- Give the player some stats: How many rounds have been played? Which was the best score? How long did each game take?