Number Guessing Game - Python Project Report

Submitted by: Vijay Kumar H and Veeresh

Submitted to: Sanjana Prasad

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Introduction

This project is a console-based Number Guessing Game developed in Python. The game generates a random number between 1 and 100, and the player has to guess it within a limited number of attempts depending on the difficulty level selected.

Features

- Multiple difficulty levels: Easy, Medium, Hard, Expert

- Validates user input and gives appropriate hints

- Provides feedback with 'Hot', 'Warm', or 'Cold' hints

- Tracks previous guesses and remaining attempts

- Option to replay the game

Python Code

```
import random
import sys
import time

class NumberGuessingGame:
    def __init__(self):
        self.difficulty_settings = {
            "easy": 10,
            "medium": 7,
            "hard": 5,
            "expert": 3
        }
        self.secret_number = None
        self.attempts = None
        self.difficulty = None
        self.previous_guesses = []

    def clear_screen(self):
        # Works for Windows and Unix
```

```
    import os
    os.system('cls' if os.name == 'nt' else 'clear')

def welcome_message(self):
    print("=" * 52)
    print("            Welcome to the Number Guessing Game")
    print("=" * 52)
    print("Try to guess the secret number between 1 and 100!")
    print("You can choose your difficulty level.")
    print()

def select_difficulty(self):
    while True:
        print("Select your difficulty:")
        print("  [easy]   - 10 attempts")
        print("  [medium] - 7 attempts")
        print("  [hard]   - 5 attempts")
        print("  [expert] - 3 attempts")
        difficulty = input("Enter difficulty (easy/medium/hard/expert): ").lower().strip()
        if difficulty in self.difficulty_settings:
            self.difficulty = difficulty
            self.attempts = self.difficulty_settings[difficulty]
            break
        else:
            print("Invalid input. Please choose easy, medium, hard, or expert.\n")

def initialize_game(self):
    self.secret_number = random.randint(1, 100)
    self.previous_guesses = []
    print(f"\nI've picked a number between 1 and 100.")
    print(f"You have {self.attempts} attempts. Good luck!\n")

def get_guess(self):
    while True:
        guess_input = input("Make a guess (1-100): ").strip()
        if not guess_input.isdigit():
            print("Invalid input! Please enter a valid number between 1 and 100.")
            continue
        guess = int(guess_input)
        if guess < 1 or guess > 100:
            print("Number out of range. Please enter a number between 1 and 100.")
            continue
        if guess in self.previous_guesses:
            print("You already guessed that number! Try a different one.")
            continue
        return guess

def provide_hint(self, guess):
    distance = abs(self.secret_number - guess)
    if guess > self.secret_number:
        hint = "Too high"
    else:
        hint = "Too low"

    if distance > 30:
        temp = "Cold"
    elif distance > 15:
        temp = "Warm"
    else:
```

```
            temp = "Hot"
        print(f"{hint}! ({temp})")

    def play_round(self):
        while self.attempts > 0:
            guess = self.get_guess()
            self.previous_guesses.append(guess)
            self.attempts -= 1

            if guess == self.secret_number:
                print(f"\nCongratulations! You guessed the number in {len(self.previous_guesses)} tries!")
                print(f"The number was indeed {self.secret_number}.")
                return True
            else:
                self.provide_hint(guess)
                if self.attempts > 0:
                    print(f"Attempts left: {self.attempts}")
                else:
                    print("No attempts left.")
                print(f"Previous guesses: {sorted(self.previous_guesses)}\n")
        return False

    def game_over(self):
        print("\nGame over!")
        print(f"The secret number was {self.secret_number}.")
        print(f"Your guesses: {sorted(self.previous_guesses)}")

    def play_again_prompt(self):
        while True:
            choice = input("\nWould you like to play again? (yes/no): ").lower().strip()
            if choice in ['yes', 'no', 'y', 'n']:
                return choice.startswith('y')
            else:
                print("Please enter 'yes' or 'no'.")

    def run(self):
        while True:
            self.clear_screen()
            self.welcome_message()
            self.select_difficulty()
            self.initialize_game()
            guessed = self.play_round()
            if not guessed:
                self.game_over()
            if not self.play_again_prompt():
                print("\nThank you for playing the Number Guessing Game! Goodbye!\n")
                time.sleep(1)
                break

if __name__ == "__main__":
    game = NumberGuessingGame()
    game.run()
```

Sample Output

Welcome to the Number Guessing Game

Select your difficulty: easy

I've picked a number between 1 and 100.

You have 10 attempts. Good luck!

Make a guess: 50

Too low! (Warm)

Attempts left: 9

Previous guesses: [50]

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