### **Project 1: Number Guessing Game**

#### **Objective:**

Create a simple number guessing game where the computer randomly selects a number, and the user has to guess it. The program should provide hints, such as "higher" or "lower," after each guess.

### **Instructions**

#### **Step 1: Set Up the Environment**

1. Open your preferred Python development environment (IDE) or a simple code editor like VS Code.
2. Create a new Python file called number\_guessing\_game.py.

#### **Step 2: Import Libraries**

You need the random library to generate a random number. Import it at the top of your script:  
python  
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import random

#### **Step 3: Generate a Random Number**

Use the randint() function from the random library to select a random number between 1 and 100. Store it in a variable called secret\_number.  
python  
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secret\_number = random.randint(1, 100)

#### **Step 4: Create the Game Loop**

1. Create a while loop that will continue running until the user guesses the number correctly.

Prompt the user to enter their guess using the input() function.  
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while True:

guess = int(input("Guess the number between 1 and 100: "))

#### **Step 5: Implement Guess Comparison**

1. Inside the loop, compare the user's guess to the secret\_number.
2. Provide feedback using if, elif, and else statements:
   * If the guess is lower than the secret\_number, print: "Higher!"
   * If the guess is higher than the secret\_number, print: "Lower!"
   * If the guess matches the secret\_number, print: "Congratulations! You've guessed the number!" and break out of the loop.

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if guess < secret\_number:

print("Higher!")

elif guess > secret\_number:

print("Lower!")

else:

print("Congratulations! You've guessed the number!")

break

#### **Step 6: Add a Counter**

1. Add a counter to track the number of attempts the user has made.

Initialize the counter before the loop:  
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attempts = 0

Increment the counter each time the user makes a guess:  
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attempts += 1

After the user guesses the number correctly, display the number of attempts taken:  
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print(f"It took you {attempts} attempts to guess the number.")

#### **Step 7: Provide Option to Play Again**

1. After the user guesses the number, ask if they want to play again.

If the answer is yes, generate a new random number and reset the counter. If not, exit the game.  
python  
Copy code  
play\_again = input("Do you want to play again? (yes/no): ").lower()

if play\_again == 'yes':

secret\_number = random.randint(1, 100)

attempts = 0

else:

print("Thank you for playing!")

break

#### **Step 8: Final Code**

Put it all together, and your final code should look like this:

python

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import random

# Step 1: Generate a random number

secret\_number = random.randint(1, 100)

attempts = 0

# Step 2: Game loop

while True:

# Prompt user for input and convert to integer

guess = int(input("Guess the number between 1 and 100: "))

attempts += 1

# Provide feedback

if guess < secret\_number:

print("Higher!")

elif guess > secret\_number:

print("Lower!")

else:

print(f"Congratulations! You've guessed the number in {attempts} attempts.")

# Step 3: Play again or exit

play\_again = input("Do you want to play again? (yes/no): ").lower()

if play\_again == 'yes':

secret\_number = random.randint(1, 100)

attempts = 0

else:

print("Thank you for playing!")

break

#### **Step 9: Run and Test**

* Run the script in your Python environment and test the game by making a few guesses.
* Ensure that the feedback provided is accurate and the game behaves as expected when the correct number is guessed.