



GUESS GAME PROGRAM WHITEPAPER

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Introduction:

Python is a very versatile language. The scope of python is very large. We can use python to make web based applications, task automating scripts, machine learning, data science, etc.

We can also make games using python. Games usually work on infinite loop until a specific event occurs. This specific event can be programmatically defined event, condition or a run-time error. To make this possible we use while loops in python. While loops run a block of code in infinite loop as long as condition passed to it returns a Boolean value as true.

We will make use of python to create a simple command line game. The name of this game is 'Guess the Number'.

Problem Statement:

A user needs to guess the number within a predefined valid range. He/she will get only three attempts to guess the number.

Objective:

Write a program which stores a number from predefined range. Let a user guess the number before he/she runs out of attempts.

Description:

Let user choose difficulty level of the game which will be easy, medium or hard. Based on the difficulty level the random number will be generated within a specific range which a user must guess.

This difficulty range will be as follows: for easy difficulty level range will be from 1 to 20, for medium difficulty level range will be from 1 to 50 and for hard difficulty level range will be from 1 to 100.

User will get only three attempts to guess the right number. After each unsuccessful attempt a prompt will appear which will say how many attempts are left as well as a direction for guessing the correct number. If a number guessed by a user is wrong the prompt will tell the user to guess lower or higher number to put.

If user guess the right number before he/she runs out of attempts then congratulations, you have won otherwise you lose. Correct number will be displayed at the end.

Code:

```
from random import randint

print("""
*****
* Guess the number correctly within 1 to 100          *
* Three Difficulty levels with valid range            *
* Easy   : 1 - 20                                     *
* Medium : 1 - 50                                     *
* Hard   : 1 - 100                                    *
*                                                  *
* Rules:                                              *
* 1. You will get three chances only to guess.        *
* 2. Number should be within the valid range.        *
* 3. Minus(-) values are not allowed                *
*                                                  *
*****Lets, Begin !!!*****
""")

difficulty = input("Choose Difficulty Level : ")
attempts = 3
if difficulty == 'Easy':
    number = randint(1,20)
elif difficulty == 'Medium':
    number = randint(1,50)
elif difficulty == 'Hard':
    number = randint(1,100)
else:
    print("Choose Proper Difficulty Level : ")

while attempts > 0:
    user_number = int(input("Guess the number: "))
    if user_number == number:
        print("\nCongratulations ! You have guessed the number correctly.")
        break
    elif user_number < 0:
        print("Number is out of valid range.")
        attempts = attempts - 1
        print("-----")
        print(f"{attempts} attempts left")
        print("-----")
    elif difficulty == 'Easy' and user_number > 20:
        print("Number is out of valid range.")
        attempts = attempts - 1
        print("-----")
        print(f"{attempts} attempts left")
        print("-----")
    elif difficulty == 'Medium' and user_number > 50:
        print("Number is out of valid range.")
        attempts = attempts - 1
        print("-----")
        print(f"{attempts} attempts left")
        print("-----")
```

```

elif difficulty == 'Hard' and user_number > 100:
    print("Number is out of valid range.")
    attempts = attempts - 1
    print("-----")
    print(f"{attempts} attempts left")
    print("-----")
elif user_number != number and attempts > 0:
    if user_number > number and user_number - number < 30:
        print("You are close. Put a lower number.")
    elif number > user_number and number - user_number < 30:
        print("You are close. Put a higher number")
    attempts = attempts - 1
    print("-----")
    print(f"{attempts} attempts left")
    print("-----")
if attempts == 0:
    print("\nSorry! You couldn't guess the number")
    print(f"Correct number was '{number}'")

```

Output:

```

*****
* Guess the number correctly within 1 to 100 *
* Three Difficulty levels with valid range *
* Easy : 1 - 20 *
* Medium : 1 - 50 *
* Hard : 1 - 100 *
* *
* Rules: *
* 1. You will get three chances only to guess. *
* 2. Number should be within the valid range. *
* 3. Minus(-) values are not allowed *
* *
*****Lets, Begin !!!*****

Choose Difficulty Level : Hard
Number : 26
Guess the number: -10
Number is out of valid range.
-----
2 attempts left
-----
Guess the number: 101
Number is out of valid range.
-----
1 attempts left
-----
Guess the number: 26

Congratulations ! You have guessed the number correctly.

```

Explanation:

Step 1: Import randint from random modules for generating a random number.

Step 2: Display difficulty range and rules of the game with print function.

Step 3: Store maximum number of attempts in a variable. Ask user to choose difficulty level. Based on difficulty level generate a random number using randint() within specified range.

Step 4: Run a while loop which check if attempts are '0' or not. As long a attempts are more than zero run the code inside a loop.

Step 5: As a user to guess the number. If a number is guessed in first attempt then greet the user with a message – "Congratulations! You have guessed the number correctly."

Step 6: Otherwise check further conditions. If number is less than zero or it is out of valid range according to difficulty level then display a prompt with a message - "Number is out of valid range."

Step 7: If none of these situations occur, then check how close the number is from correct number and prompt the user to put lower or higher number.

Step 8: Give three chances to the user if he/she fails to guess the correct number then display a message - "Sorry! You couldn't guess the number. Correct number was <original number>".

Reference:

Books:

Learn Python the Hard Way
Python Crash Course by Eric Matthes

Websites:

<https://www.geeksforgeeks.org>
<https://docs.python.org>

Feedback:

If you have query regarding python then feel free to mail me on my email id mentioned below. Let's see if I can solve your issue. Until then keep learning, keep coding and keep exploring new stuff.

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