CSC1024 PROGRAMMING PRINCIPLES
Programming Project:
A Master Mind Computer Game

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Presentation Video Web link:
https://youtu.be/kwofiOJhJ70

WHAT IS MASTER MIND ?

- Master Mind is a code-breaking game for two players. (code maker & code breaker)
- The code maker chooses a pattern of four colour code
- The code breaker will guess the four colour code

Introduction

OBJECTIVE

Create a Master Mind computer game with Python programming language

DIFFERENCE

Type of fruits to replace the colour beans.

LIMITATION

Only the random library (import random) is allowed.

Demonstration

01

Input and display data

Input and display data

A welcome message and options will be displayed to player once they run the program. This interactive menu can guide the player throughout the programme.

```
menu():
# Welcome message to player
print('+-------------------------------------+')
print('| Welcome to Mastermind Computer Game |')
print('+-------------------------------------+\n')
print('[1] Start game')
print('[2] How to play')
print('[3] Exit game ')
```

Interactive user menu

```
menu()
option = int(input('Enter your option: '))
while option != 3:
    if option == 1:
        start_game()
    elif option == 2:
        instruction()
    else:
        print('ERROR! Invalid option\n')
        menu()

    print()
    option = int(input('Enter your option: '))

print('Thank you, bye!')
```

Input and display data

```
instruction_option = int(input('Enter 1 to return main menu or 2 to start game: '))
while instruction_option != 1:
    if instruction_option == 2:
        start_game()
    else:
        print('ERROR! Invalid option\n')
        instruction_option = int(input('Enter 1 to return main menu or 2 to start game: '))
menu()
```

How to play screen

02

List

List

Lists are very important and useful to store player input, given fruits and the randomized fruits.

```
fruits = ['apple', 'orange', 'mango', 'grape']
```

Fruit list

```
guessed_fruit = []
```

```
fruit_code = []
```

Empty list

03

Random choice from a list

Random choice from a list

```
import random
fruit_code = []
fruit_code = random.choices(fruits, k=4)
```

Generate a randomized code from fruit list

```
fruits = ['apple', 'orange', 'mango', 'grape']
```

Fruit list

04

If statement

If statement

1) Ensure player to enter 4 guesses

```
while count < 4:
    player_guess = input('Enter your guess: ').lower()
    if player_guess in fruits:
        guessed_fruit.append(player_guess)
        count += 1
    else:
        print('Try again')
print(guessed_fruit)
return guessed_fruit
```

Player guess sequence

```
guessed_fruit = []
```

Player guess list

If statement

2) Checking the number of correct position of player guess

```
for i in range(4):
    if guessed_fruit[i] in copy_ans_code[i]:
        if guessed_fruit[i] == ans_code[i]:
            correct += 1
```

Correct fruit

05

Relational operator

Relational operator

Main menu screen

```
menu()
option = int(input('Enter your option: '))
while option != 3:
    if option == 1:
        start_game()
    elif option == 2:
        instruction()
    else:
        print('ERROR! Invalid option\n')
        menu()

    print()
    option = int(input('Enter your option: '))

print('Thank you, bye!')
```

Enter 1 to start game
Enter 2 for instruction
Enter 3 to exit game

06

Logical operator

Logical operator

Play again

```
again = input('Do you want to play again? [Y/N]: ')
print()
# When player enter Y or y
if again == 'Y' or 'y' == again:
    print('New Game')
    print('+-------------------------------------+')
    print('| Welcome to Mastermind Computer Game |')
    print('+-------------------------------------+\n')
    print("Guess the fruit code in as few tries as possible.\n")
    print("Use the fruits given below:\napple, orange, mango and grape\n")
    break
# When player enter N or n
elif again == 'N' or 'n' == again:
    print('Thank you for playing!')
    quit()
    break
# Try again when other input is being entered
else:
    print('ERROR! Invalid option')
    continue
```

Enter Y or y to play again
Enter N or n to exit game

07

Loops

Loops

While Loop

```
while count < 4:
    player_guess = input('Enter your guess: ').lower()
    if player_guess in fruits:
        guessed_fruit.append(player_guess)
        count += 1
    else:
        print('Try again')
print(guessed_fruit)
return guessed_fruit
```

To loop the counting until player guess equal to 4

Loops

For Loop

```
for i in range(4):
    if guessed_fruit[i] in copy_ans_code[i]:
        if guessed_fruit[i] == ans_code[i]:
            correct += 1
```

To loop for checking whether player guess is same as mastermind code

08

User-defined function

User-defined function

Simplify the code

```
# Function for main menu
def menu():...


# Function for [1] Start game
def start_game():...


# Function for [2] How to play
def instruction():...
```

Functions

```
# Computer chooses four fruits randomly
def random():...

# Player inputs the guess of fruit
def guess(fruits):...

# Check if player's guess is correct
def check(guessed_fruits, answer_code):...
```

Nested functions

THANK YOU!