Lesson 1: Week 1 - From Problem Description to Python Program Example

Created: 2024-05-27T01:25:36.720507+10:00

From Problem Description to Python Program Example

Python Program Example

From Problem Description to Python Program
An Illustrative Example

1. Problem Description / Requirements

Develop a flowchart that represents the behaviour of the following program:

A program needs to show the user a menu with **three options**.

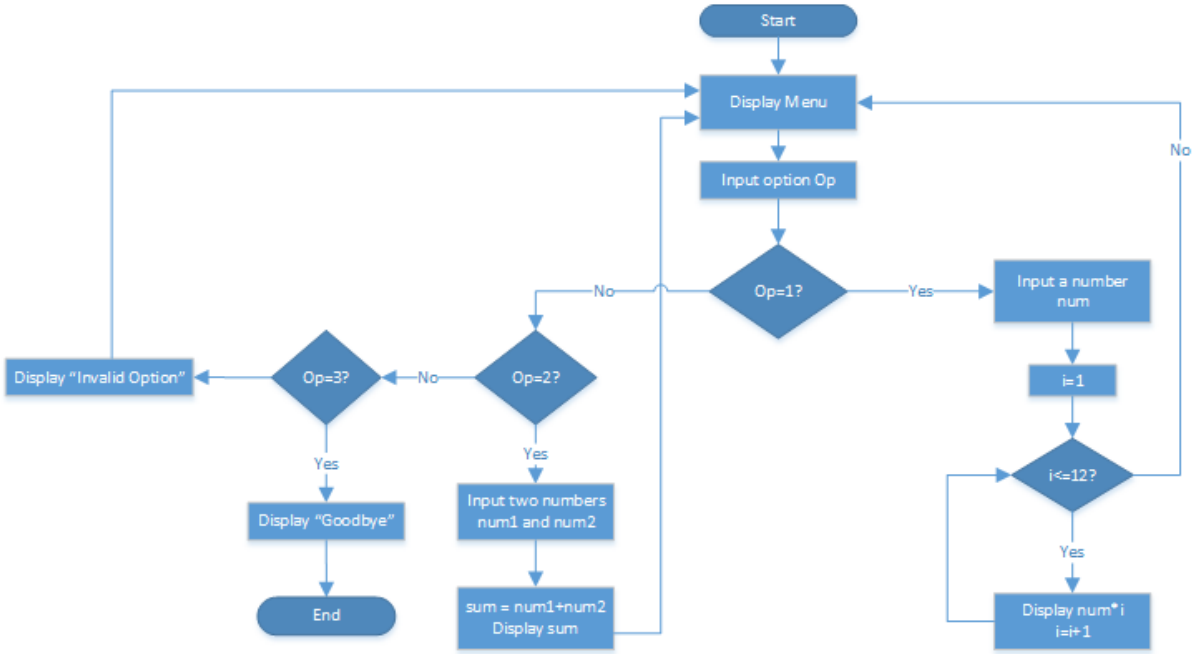
If the user selects the **first option**, the program will **ask the user for a number**. Once the user enters the number, the program will display the output of **multiplying that number in sequence by every number between 1 and 12 inclusive**. For example, if the user enters the number **2**, the program will display **2**, **4**, **6**, **8**, **10**, **12**, **14**, **16**, **18**, **20**, **22**, **24**. The program will then **display the menu again** so that the user can select another option (which may be the first option again).

If the user selects the **second option**, the program will **ask the user for two numbers**. The program will **add these numbers together** and **display their sum**. The **menu will then be displayed** again so that the user can select another option (which may be the second option again).

If the user selects the **third option**, the program will **display** the message "**Goodbye**" and will **end**.

If the user selects none of the options **1**, **2**, or **3** then the program will **display** the message "**Invalid Option**". The **menu will then be displayed** again so that the user can select a valid option.

2. Flowchart Design



3. Python Program

```
while True:
    print("1. Multiply the given number by 1 to 12")
    print('2. Sum two given numbers')
    print('3. Exit')
    choice = input('Please enter your choice: ')
    if choice == '1':
        num = float(input('Give a number: '))
        i = 1
        while i <= 12:
            print(num*i,end=' ') # use print(num*i) if we want to display one per line
            i = i + 1
        print()
    elif choice == '2':
        num1 = float(input('Give your first number: '))
        num2 = float(input('Give your second number: '))
        res = num1 + num2
        print(res)
    elif choice == '3':
        print("Goodbye")
        break
    else:
        print("Invalid choice")
```

Or

```
choice = '' # or any value different from '3'
while choice != '3':
    print("1. Multiply the given number by 1 to 12")
    print('2. Sum two given numbers')
    print('3. Exit')
    choice = input('Please enter your choice: ')
    if choice == '1':
        num = float(input('Give a number: '))
        i = 1
        while i <= 12:
            print(num*i,end=' ') # use print(num*i) if we want to display one per line
            i = i + 1
        print()
    elif choice == '2':
        num1 = float(input('Give your first number: '))
        num2 = float(input('Give your second number: '))
        res = num1 + num2
        print(res)
    elif choice == '3':
        print("Goodbye")
    else:
        print("Invalid choice")
```

Or

```
exit_chosen = False
while not exit_chosen:
    print("1. Multiply the given number by 1 to 12")
    print('2. Sum two given numbers')
    print('3. Exit')
    choice = input('Please enter your choice: ')
    if choice == '1':
        num = float(input('Give a number: '))
        i = 1
        while i <= 12:
            print(num*i,end=' ') # use print(num*i) if we want to display one per line
            i = i + 1
        print()
    elif choice == '2':
        num1 = float(input('Give your first number: '))
        num2 = float(input('Give your second number: '))
        res = num1 + num2
        print(res)
    elif choice == '3':
        print("Goodbye")
        exit_chosen = True
    else:
        print("Invalid choice")
```