Ch5: Conditional Statement

305172 Computer Programming
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Write Conditions in Python

1 condition

```
if 2 < 3:
    print("Two is less than Three")
```

2 conditions

```
if 3 < 2:
    print("Two is less than Three")
else:
    print("Two is NOT less than Three")
```

More than 2 conditions

```
if 2 < 2:
    print("Two is less than Two")
elif 2 > 3:
    print("Two is NOT less than Two")
else:
    print("Two is equal Two")
```

Pattern of one Condition in Python

if เงื่อนไข :
       สิ่งที่ต้องการให้ทำเมื่อเงื่อนไขเป็นจริง

```python
if 2 < 3:
    print("Two is less than Three")
```

```python
a = input("Enter a number: ")
b = input("Enter a number: ")

if a < b:
    print("a is less than b")
```

Handle one Condition in Python

```python
a = input("Enter a number: ")
b = input("Enter a number: ")

if a < b:
    print("a is less than b")
    print("a =",a)
    print("b =",b)

print("end")
```

```
Enter a number: 5
Enter a number: 3
end


Enter a number: 2
Enter a number: 3
a is less than b
a = 2
b = 3
end
```

Scope in if, these statements can be executed only when the condition is true

Exercise

- Write a code to show a message "You don't have enough money" when you have to pay more than the money you have.

  Get an input of your money and calculate total price if your input is in a form of : product name, price per unit , number of units.

  Input: Money = 10
                Mama   5.50   3
  output: Total price of Mama is 16.50 .
                You don't have enough money!
  Input: Money = 100
                Shampoo   28   2
  output: Total price of Shampoo is 56.

Pattern of two Conditions in Python

if เงื่อนไข :

        สิ่งที่ต้องการให้ทำเมื่อเงื่อนไขเป็นจริง

else :

        สิ่งที่ต้องการให้ทำเมื่อเงื่อนไขเป็นเท็จ

```python
if 3 < 2:
    print("Two is less than Three")
else:
    print("Two is NOT less than Three")
```

```python
a = input("Enter a number: ")
b = input("Enter a number: ")


if a < b:
    print("a is less than b")
else:
    print("a is NOT less than b")
```

Handle two Conditions in Python

```python
a = input("Enter a number: ")
b = input("Enter a number: ")


if a < b:
    print("a is less than b")
    print("a = ",a)
else:
    print("a is NOT less than b")
    print("b = ",b)

print("end")
```

```
Enter a number: 3
Enter a number: 5
a is less than b
a =  3
end


Enter a number: 8
Enter a number: 2
a is NOT less than b
b =  2
end
```

Scope in else, executed when the condition is false

Scope in if, executed when the condition is true

Exercise

- Write a code to show a message "You don't have enough money" when you have to pay more than the money you have or show a number of change when you have enough money to pay.

  Get an input of your money and calculate total price if your input is in a form of : product name, price per unit , number of units.

  Input: Money = 10
        Mama 5.50 3
  output: Total price of Mama is 16.50 .
        You don't have enough money!
  Input: Money = 100
        Shampoo 28 2
  output: Total price of Shampoo is 56.
        Your change = 44.

Pattern of many Conditions in Python

if เงื่อนไข :
        สิ่งที่ต้องการให้ทำเมื่อเงื่อนไขเป็นจริง
elsif เงื่อนไขถัดไป :
        สิ่งที่ต้องการให้ทำเมื่อเงื่อนไขที่แล้วเป็นเท็จ
elsif เงื่อนไขถัดไป :
        สิ่งที่ต้องการให้ทำเมื่อเงื่อนไขที่แล้วมาทั้งหมดเป็นเท็จ
...
else :
        สิ่งที่ต้องการให้ทำเมื่อทุกเงื่อนไขด้านบนเป็นเท็จ

```python
if 2 < 2:
    print("Two is less than Two")
elif 2 > 2:
    print("Two is greater than Two")
else:
    print("Two is equal Two")
```

Handle many Conditions in Python

```python
a = input("Enter a number: ")
b = input("Enter a number: ")

if a < b:
    print("a is less than b")
    print("a = ",a)
elif a > b:
    print("a is greater than b")
    print("b = ",b)
else:
    print("a is equal b")
    print("%s = %s" % (a,b))

print("end")
```

```
Enter a number: 3
Enter a number: 4
a is less than b
a =  3
end

Enter a number: 9
Enter a number: 6
a is greater than b
b =  6
end

Enter a number: 2
Enter a number: 2
a is equal b
 2 = 2
end
```

Scope in else, executed when 2 above conditions are false

Scope in elsif, executed when the if condition is false

Scope in if, executed when the condition is true

Exercise

- Write a code to predict how much money your friend has. Get an input as your guessing number of money in your friend's pocket. Then asking your friend to input a correct number.

  Show a message "higher than that" when your guess is lower than the correct answer.
  Show a message "lower than that" when your guess is higher than the correct answer.
  Show a message "That's right! " when your guess is correct.

Comparision & Logical Operators

Meaning	Syntax
Less than	<
Less than and equal	<=
Greater than	>
Greater than and equal	>=
Equal	==
Not equal	!=
OR	or
AND	and
NOT	not

Example of Combining Conditions

```python
name = input("Enter your name: ")
age = input("Enter your age: ")

if int(age) >= 17 and int(age) < 19:
    print("%s is a freshman" % name)
else:
    print("%s is not a freshman" % name)
```

The program will check the 1st condition (age >=17)
if it is true,
then the program will check the 2nd condition (age < 19)

Example of Combining Conditions

```python
name = input("Enter your name: ")
age = input("Enter your age: ")

if int(age) >= 17 and int(age) < 19:
    print("%s is a freshman" % name)
elif int(age) > 0 and int(age) < 17:
    print("%s is not a freshman" % name)
    print("%s is too young" % name)
elif int(age) > 0 and int(age) >= 19:
    print("%s is not a freshman" % name)
    print("%s is too old" % name)
elif int(age) <= 0:
    print("Error! invalid input")
```

Exercise

- Write a code to predict how much money your friend has. Get an input as your guessing number of money in your friend's pocket. Then asking your friend to input a correct number.

  Show a message "higher than that" when your guess is lower than the correct answer.
  Show a message "lower than that" when your guess is higher than the correct answer.
  Show a message "Almost correct! " when your guess is 5% near the correct number.
  Show a message "That's right ! " when your guess is correct.

Input:	I guess he/she has money = 50
output:	Higher than that
Input:	I guess he/she has money = 130
output:	Lower than that
input:	I guess he/she has money = 95
output:	Almost correct!
input:	I guess he/she has money = 100
output:	That's right!

Exercise

- Write a code to calculate BMI

$$BMI = weight(kg) / height(m)^2$$

Then show a message to regarding the information in the following table.

Underweight	**< 18.5**
Normal range	18.5 – 24.99
Overweight	25 -29.99
Obese	>=30

Input: Your weight = 68 kg
            Your height = 180 cm

output: BMI=20.9877

            Your BMI is at normal range.