

Python Programing

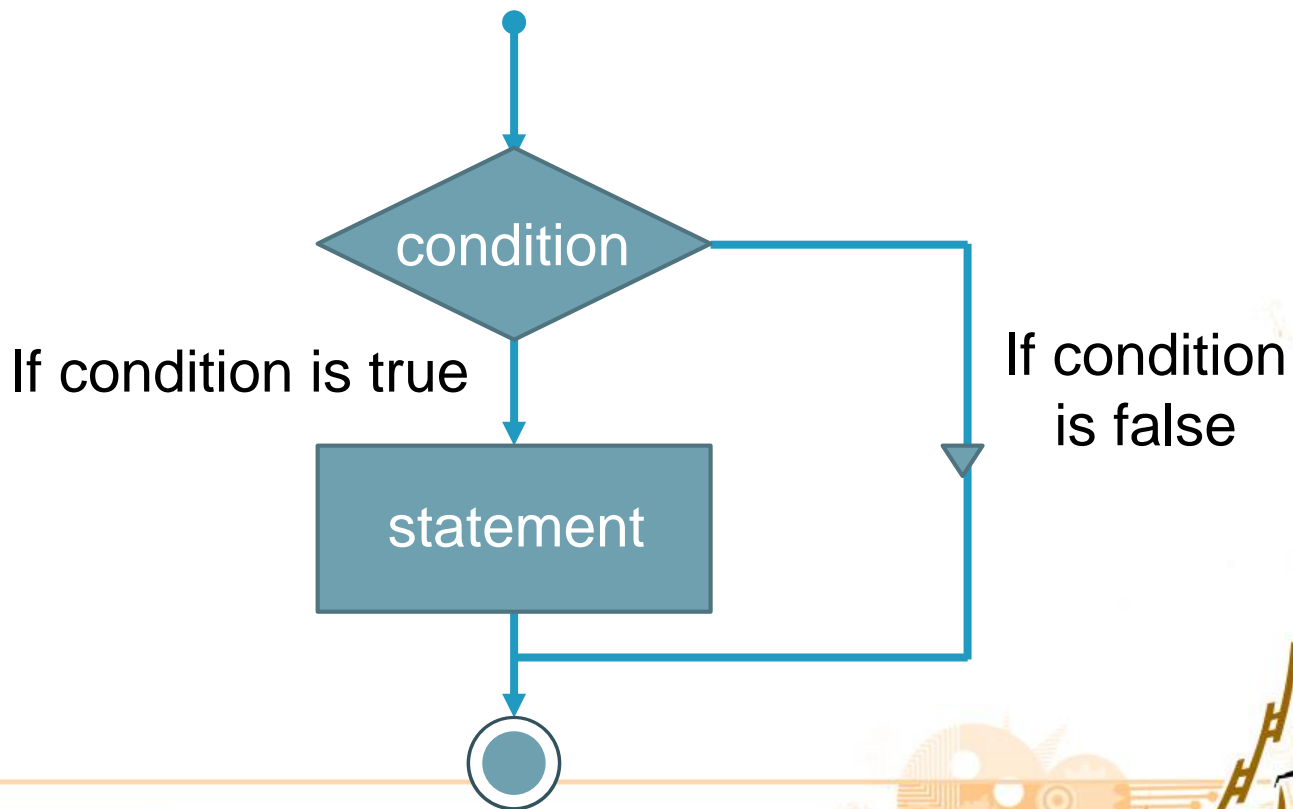
Decision Making

Decision Making

- ◎ Condition control statement
- ◎ Specifying actions taken according to the conditions.
- ◎ Decision structures evaluate multiple expressions which produce TRUE or FALSE as outcome.
- ◎ Need to determine which action to take and which statements to execute if outcome is TRUE or FALSE otherwise.

Decision Making

- ◎ The general form of a typical decision making structure.



Comparison Operators

Operator	Description	Example
==	Equal to	X == 5
!=	Not Equal to	X != 7
>	Greater than	X > 9
<	Less than	X < 1
>=	Greater than or Equal to	X >= 3
<=	Less than or Equal to	X <= 8

Logical operators

Operator	Example
and	$(x > 5) \text{ and } (x < 20)$
or	$(x == 5) \text{ or } (x == 10)$
not	Not $(x < 7)$

Membership Operators

Operator	Description	Example	Output
in	If the object in a sequence return True	2 in [1,2,3]	True
not in	If the object is not in a sequence return True	2 not in [1,3,5]	True

Allowable Operands For Boolean Expressions

If (**operand** relational operator **operand**) then:

Some operands

- integer
- real numbers
- String

Make sure that you are comparing operands of the same type!

Practice

- Assume the variables : $a = 2$, $b = 4$, $c = 6$
- For each of the following conditions indicate whether the final value is true or false.

Expression	Final result
$a == 4$ or $b > 2$	True
$6 \leq c$ and $a > 3$	False
$1 \neq b$ and $c \neq 3$	True
$a > -1$ or $a \leq b$	True
not ($a > 2$)	True

If (Simple Body)

Body of the if consists of a single statement

Format:

Indenting used to indicate
what statement is the body

If (Boolean expression):



Statement2

Example:

```
if num == 1:  
    print("Body of the if")  
print("After body")
```

If (Compound Body)

Body of the if consists of a single statement

Format:

If (Boolean expression):

```
Statement_1
```

```
Statement_2
```

```
⋮
```

```
Statement_n
```

Body

```
Statement_n+1
```

End of the indenting denotes
the end of decision-making

Decision Making statement

Decision making statements available in python are:

- ⦿ if statement
- ⦿ if...else statements
- ⦿ nested if statements
- ⦿ if...elif...else ladder

if statement

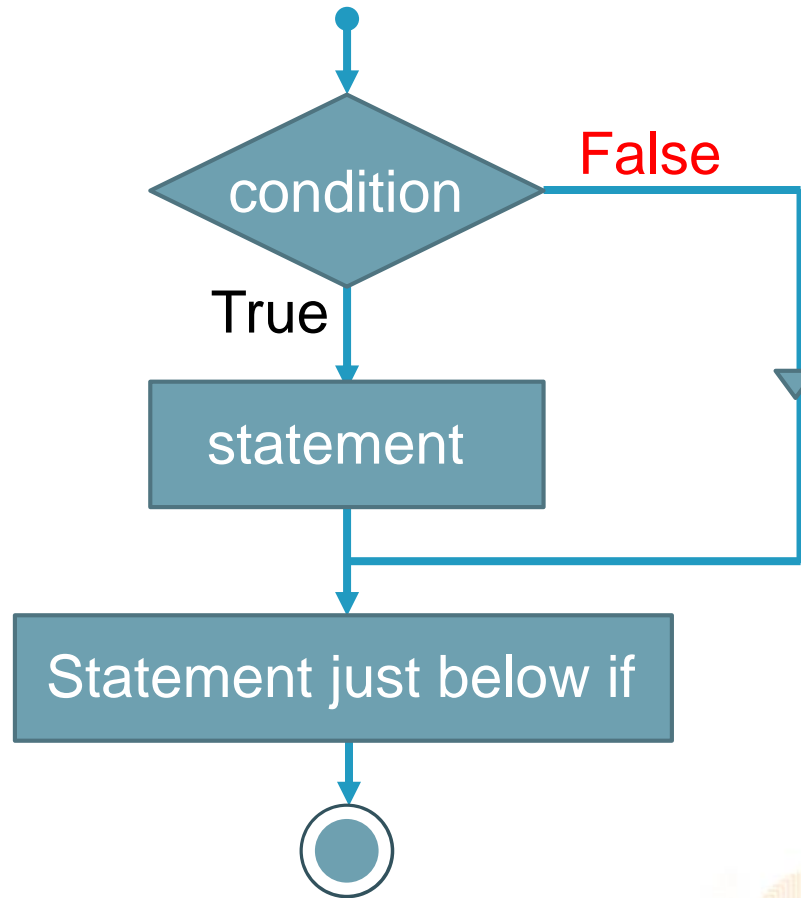
- An **if statement** consists of a boolean expression followed by one or more statements.

Syntax:

```
if    condition:  
    statement  
next statement
```

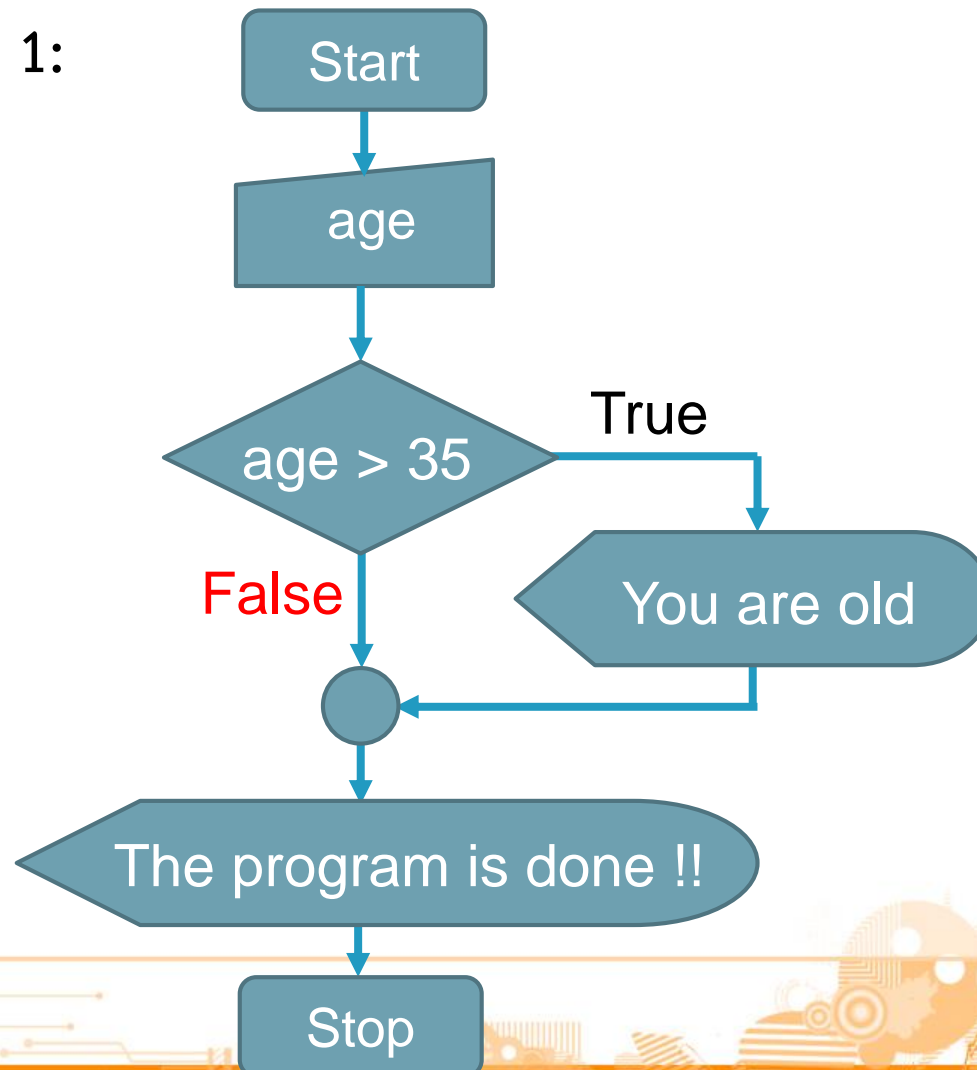
if statement

● Flowchart



if statement

Example 1:



if statement

Example 1:

```
*Ex_week3-1.py - C:/Users/JittimaJune/Documents/compro/Ex_week3-1.py (3.7.1)*
File Edit Format Run Options Window Help

# Program checks if the number of age > 35, print "You are old"

#To take the input from the user

age = int(input('please enter a number of your age: '))

#check condition
if age > 35:
    print ("You are old.")
print ("The program is done !!")
```

Output

```
===== RESTART: C:\Users\JittimaJune\Documents\compro\Ex_week3-1.py
please enter a number of your age: 33
The program is done !!
>>>
===== RESTART: C:\Users\JittimaJune\Documents\compro\Ex_week3-1.py
please enter a number of your age: 50
You are old.
The program is done !!
```

if...else statements

- ⦿ An **if statement** can be followed by an optional **else** statement, which executes when the boolean expression is FALSE.

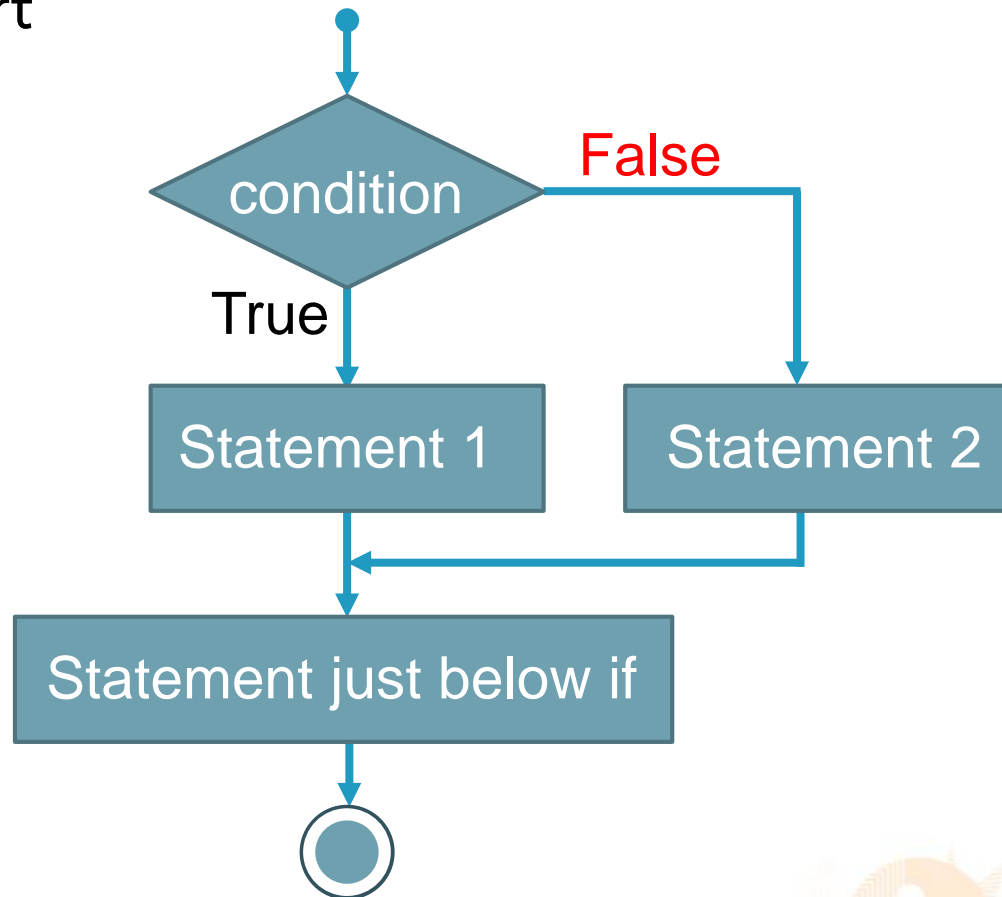
Syntax:

```
if    condition:  
    statement 1
```

```
else:  
    statement 2  
next statement
```

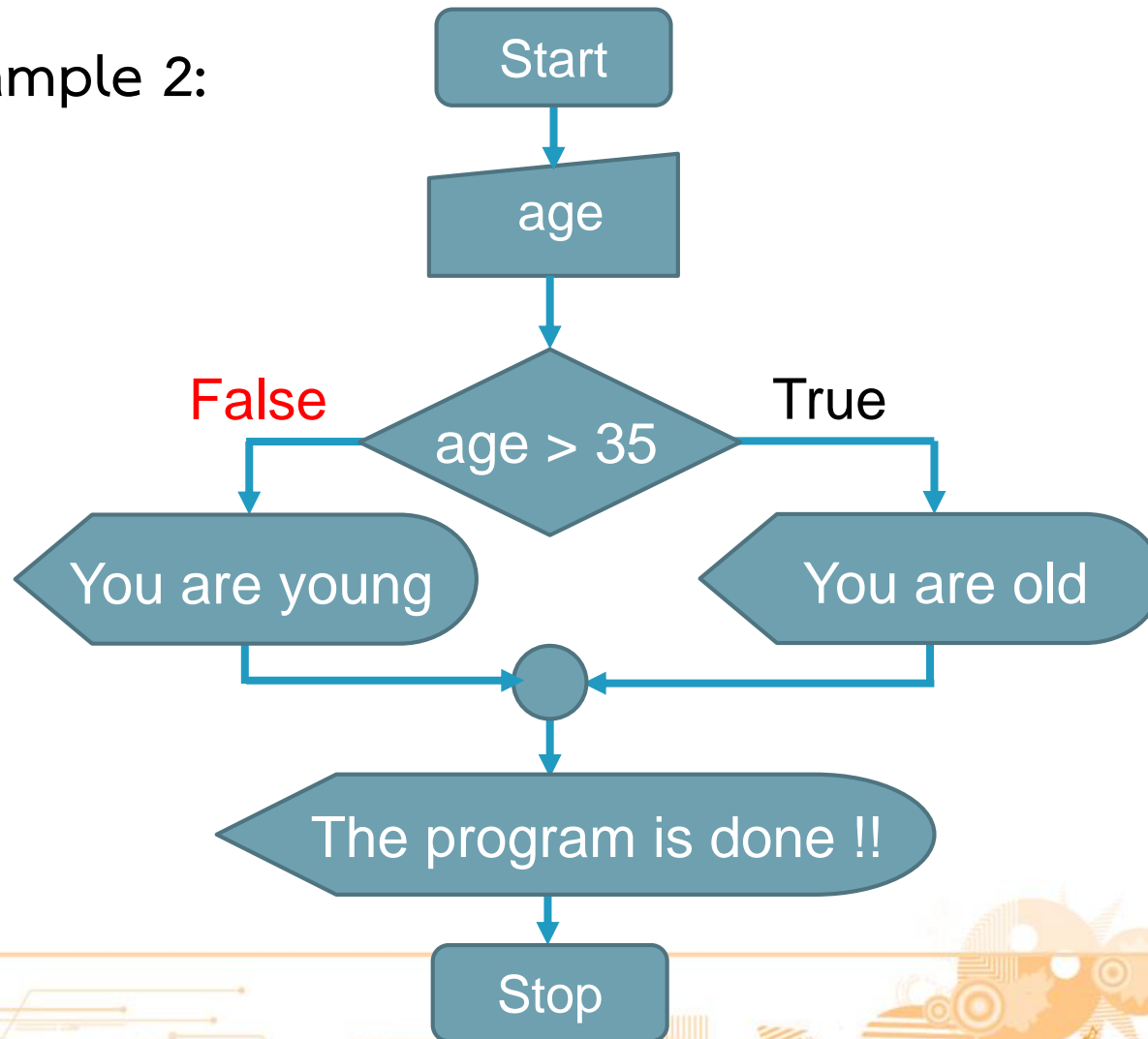

if...else statements

● Flowchart



if...else statements

◎ Example 2:



if...else statements

Example 2:

```
Ex_week3-2.py - C:/Users/JittimaJune/Documents/compro/Ex_week3-2.py (3.7.1)
File Edit Format Run Options Window Help

# Program checks if the number of age > 35
# if...else statements

# To take the input from the user

age = int(input('please enter a number of your age: '))

# check condition
if age > 35:
    print ("You are old.")
else:
    print ("You are young.")
print ("The program is done !!")
```

Output

```
===== RESTART: C:/Users/JittimaJune/Documents/compro/Ex_week3-2.py =====
please enter a number of your age: 37
You are old.
The program is done !!
```



nested if statements

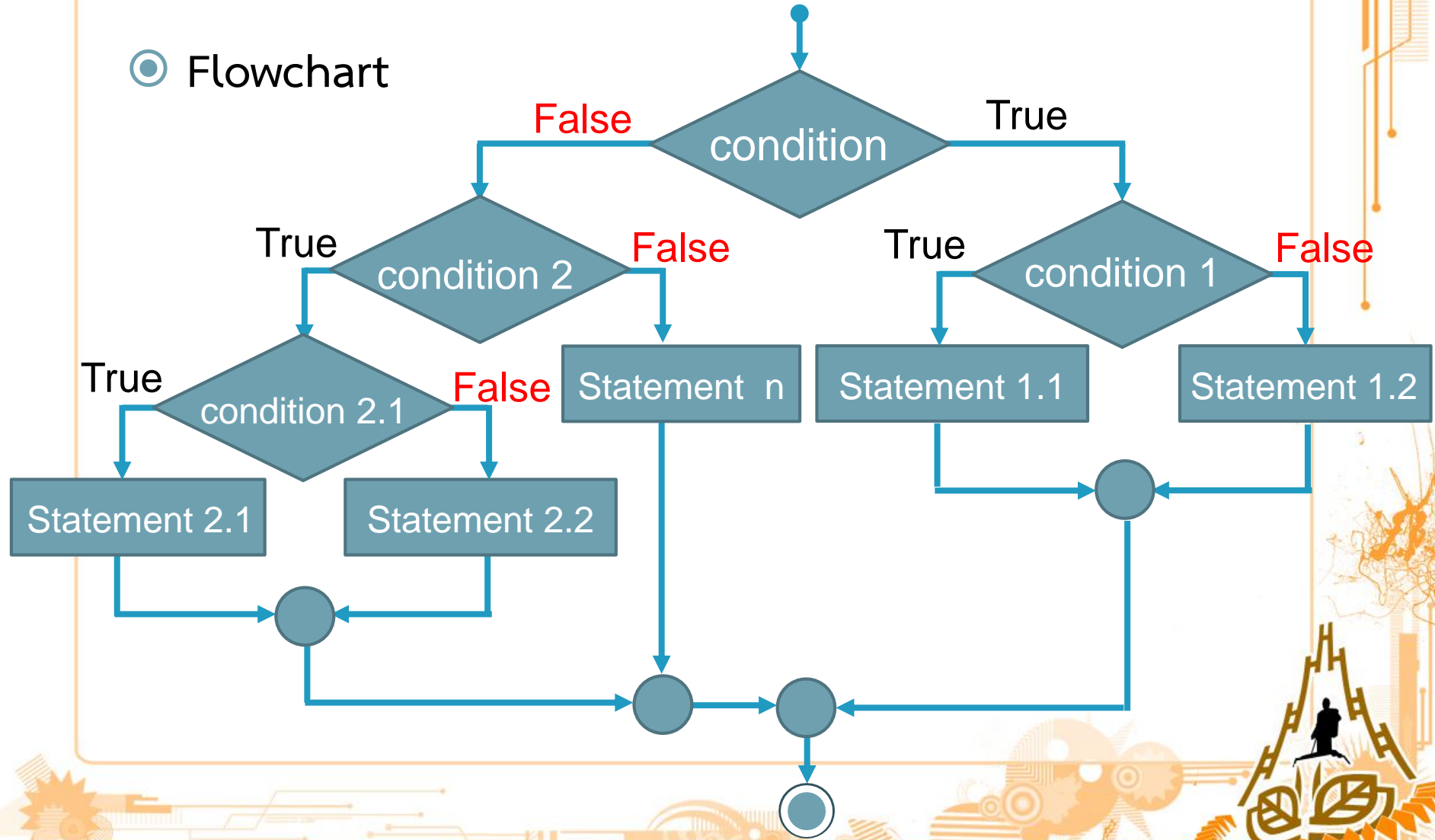
- You can use one if or else if statement inside another if or else if statement(s).

Syntax:

```
if    condition 1:  
    if condition 1.1:  
        statement 1.1  
    else:  
        statement 1.2  
elif condition 2:  
    if condition 2.1:  
        statement 2.1  
    else:  
        statement 2.2  
    ⋮  
else:  
    statement n  
next statement
```

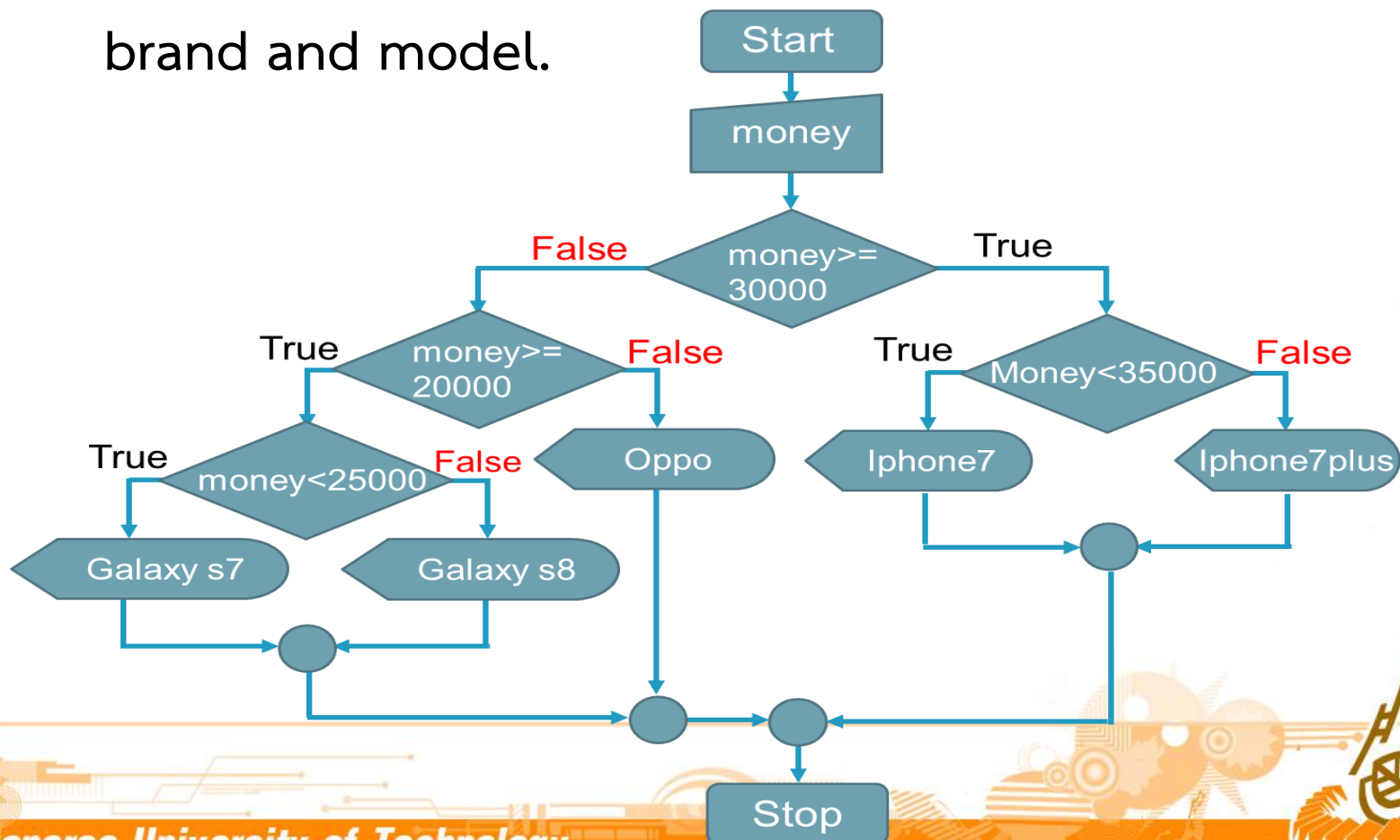
nested if statements

● Flowchart



nested if statements

- Example 3: Nested if statement to check the amount of money that can be purchased for a phone in each brand and model.



nested if statements

Example 3:

```
# Program checks the amount of money that can be purchased for a phone

#To take the input from the user
money = int(input('Please enter a number of the amount: '))

#check condition
if money >= 30000:
    if money < 35000:
        print ("Buy = Iphone7")
    else:
        print ("Buy = Iphone7plus")
elif money >= 20000:
    if money < 25000:
        print ("Buy = Galaxy s7")
    else:
        print ("Buy = Galaxy s8")
else:
    print ("Buy = Oppo")
```

Output

```
===== RESTART: C:/Users/JittimaJune/Documents/compro/Ex_week3-3.py
Please enter a number of the amount: 25000
Buy = Galaxy s8
>>>
===== RESTART: C:/Users/JittimaJune/Documents/compro/Ex_week3-3.py
Please enter a number of the amount: 32500
Buy = Iphone7
>>>
```

if...elif...else ladder

- ⦿ Decide among multiple options.
- ⦿ The if statements are executed from the top down.
- ⦿ As soon as one of the conditions controlling the if is true, the statement associated with that if is executed, and the rest of the ladder is bypassed.
- ⦿ If none of the conditions is true, then the final else statement will be executed.

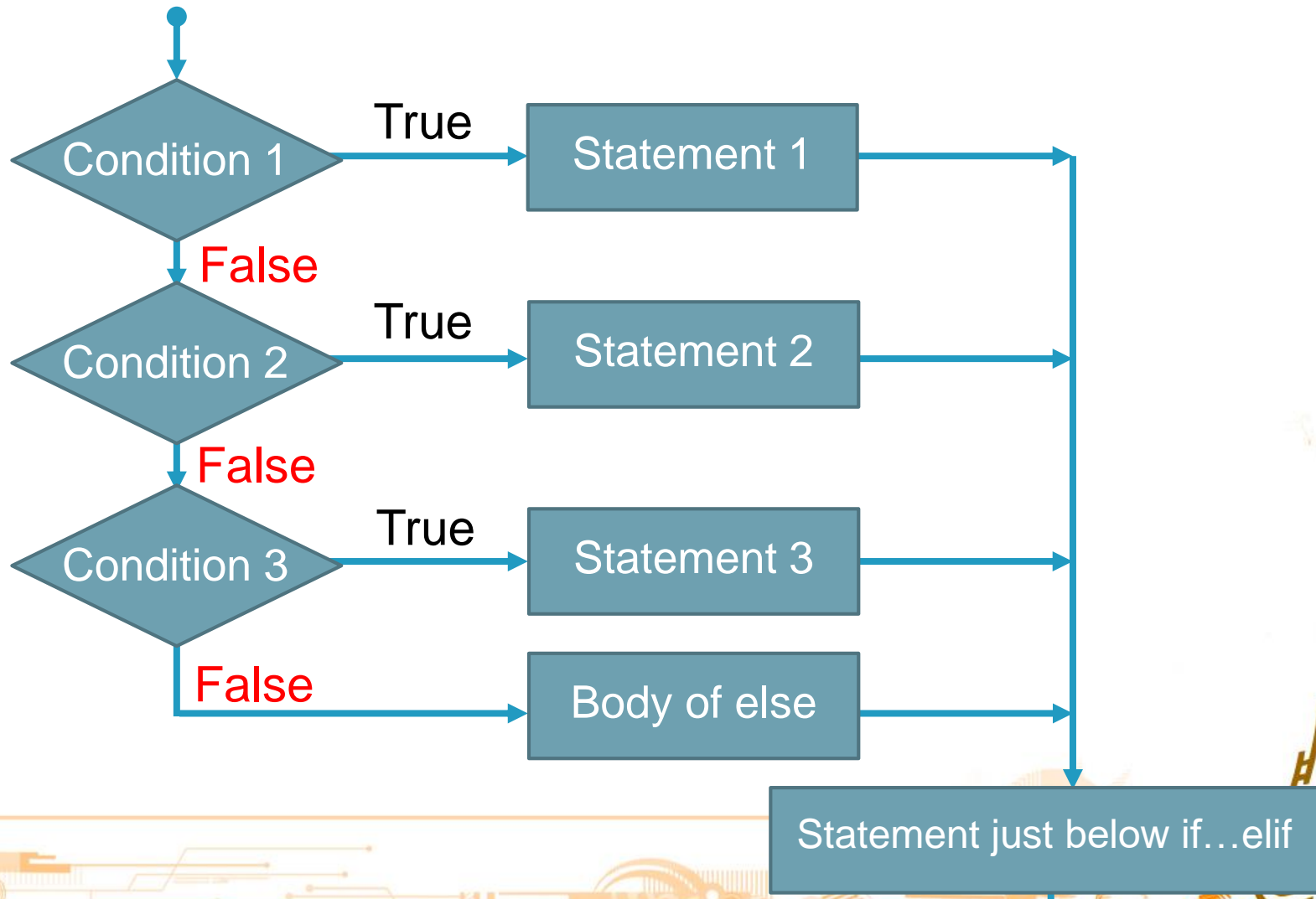
if...elif...else ladder

Syntax:

```
if    condition 1:  
    statement 1  
elif  condition 2:  
    statement 2  
    ⋮  
else:  
    statement n
```

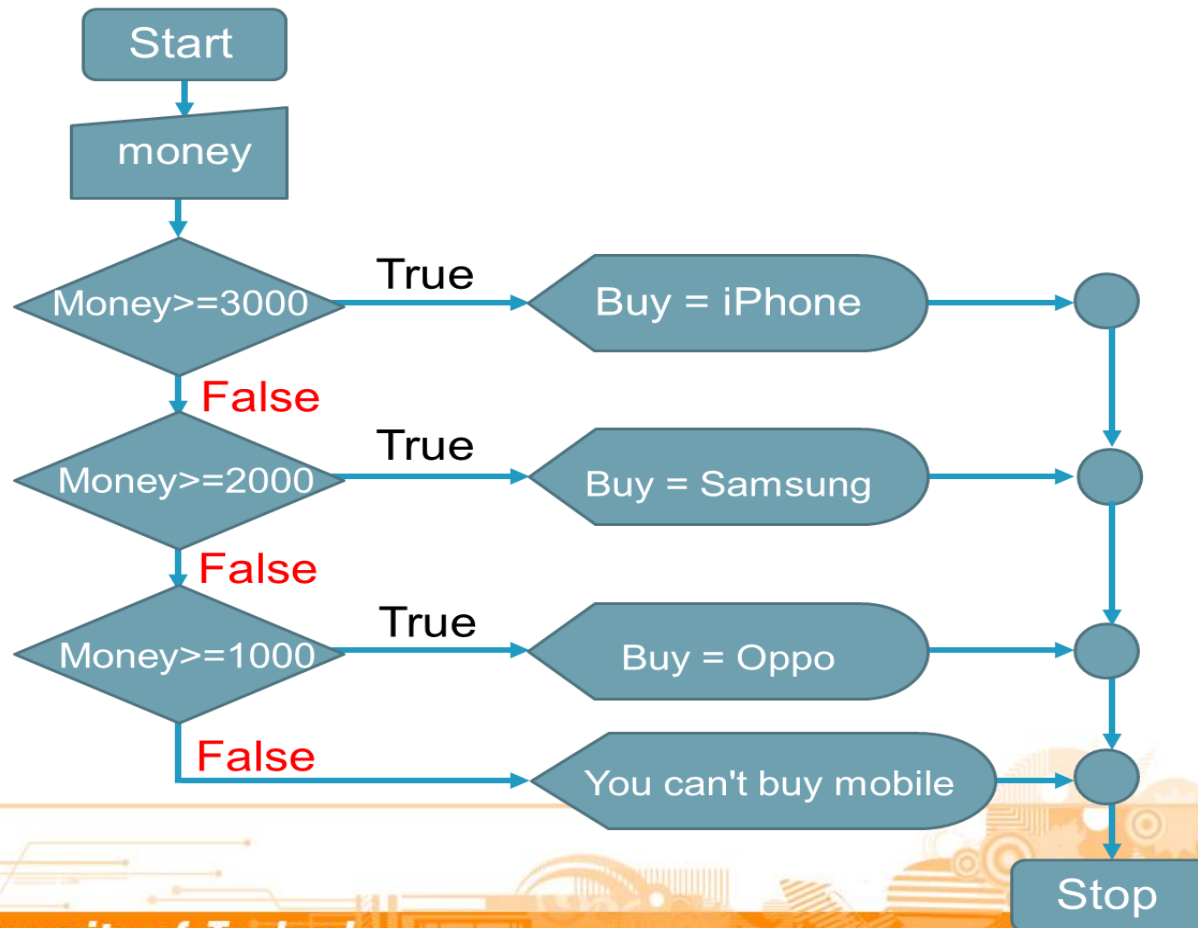


if...elif...else ladder



if...elif...else ladder

- Example 4: Nested if statement to check the amount of money that can be purchased for a phone.



if...elif...else ladder

Example 4:

```
# Program checks the amount of money that can be purchased for a phone
#if...elif...else

#To take the input from the user
money = int(input('Please enter a number of the amount: '))

#check condition
if money >= 30000:
    print ("Buy = Iphone")
elif money >= 20000:
    print ("Buy = Samsung")
elif money >= 10000:
    print ("Buy = Oppo")
else:
    print ("You can't buy mobile")
```

Output

```
===== RESTART: C:/Users/JittimaJune/Documents/compro/Ex_week3-4.py
Please enter a number of the amount: 25000
Buy = Samsung
>>>
===== RESTART: C:/Users/JittimaJune/Documents/compro/Ex_week3-4.py
Please enter a number of the amount: 9000
You can't buy mobile
>>>
```