Lecture 04: Conditional Statements

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Find output

```
x = 5
y = 2
print("x:",x,"y:",y)
t = x
x = y
y = t
print("x:",x,"y:",y)
```

Find output

```
x = 5
y = 2
print("x:",x,"y:",y)
x = x + y
y = x - y
x = x - y
print("x:",x,"y:",y)
```

Algorithms and Pseudo-codes

- You can solve any computing problem by executing a series of actions in a specific order.
- An algorithm is a procedure for solving a problem in terms of:
  1. the actions to execute, and
  2. the order in which these actions execute.
  3. Pseudocode is an informal English-like language for thinking out algorithms.

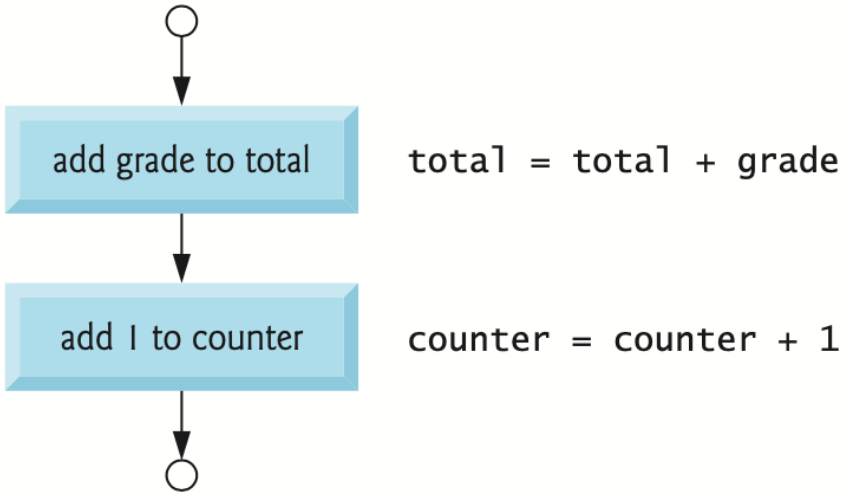
```
Prompt the user to enter the first integer
Input the first integer

Prompt the user to enter the second integer
Input the second integer

Add first integer and second integer, store their sum
Display the numbers and their sum
```

Program

```
number1 = int(input('Enter first integer: '))
number2 = int(input('Enter second integer: '))
total = number1 + number2
print('The sum of', number1, 'and', number2, 'is', total)
```

Flow-chart

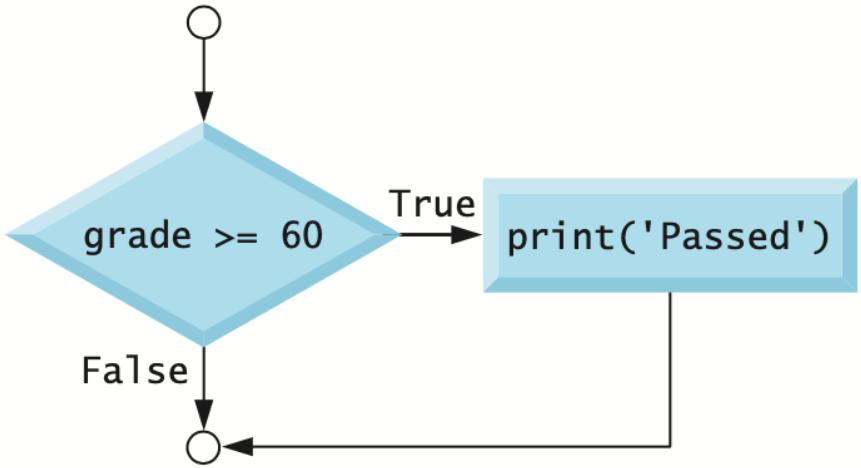
- A flowchart is a graphical representation of an algorithm or a part of one.
- You draw flow-charts using rectangles, diamonds, rounded rectangles and small circles that you connect by arrows called flowlines.
- Like pseudocode, flowcharts are useful for developing and representing algorithms.



Single selection statement

If student's grade is greater than or equal to 60
Display 'Passed'

```
if grade >= 60:
    print('Passed!')
```



Single selection statement

- Each if statement consists of the keyword if, the condition to test, and a colon (:) followed by an indented body called a suite.
- Each suite must contain one or more statements.
- Forgetting the colon (:) after the condition is a common syntax error.
- Python requires you to indent the statements in suites.

```
if grade >= 60:
    print('Passed!')
    print('Good Job!')
```

Suite Indentation Errors

```
if grade >= 60:
print("Passed!")
```

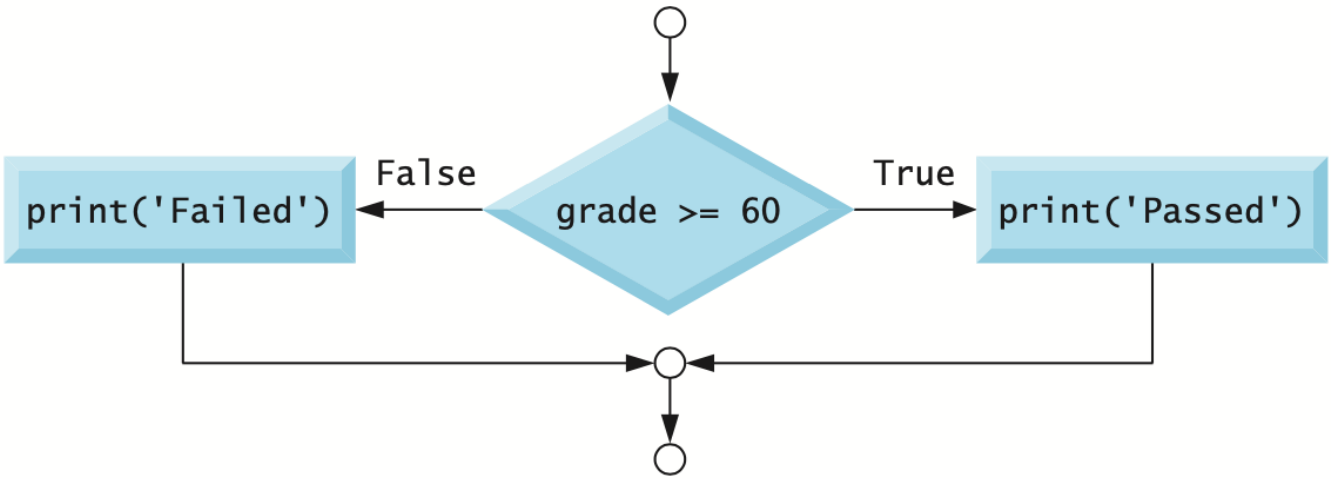
- Indenting a suite is required; otherwise, an IndentationError syntax error occurs.

```
if grade >= 60:
    print('Passed!')
  print('Good Job!')
```

Double selection Statement

```
If student's grade is greater than or equal to 60
    Display 'Passed'
Else
    Display 'Failed'
```

```python
if grade >= 60:
    print("Passed")
else:
    print("Failed")
```



Conditional Expressions

- Sometimes the suites in an if...else statement assign different values to a variable, based on a condition

```
grade = 87
if grade >= 60:
    result = 'Passed'
else:
    result = 'Failed'
```

- You can write statements using a concise conditional expression.

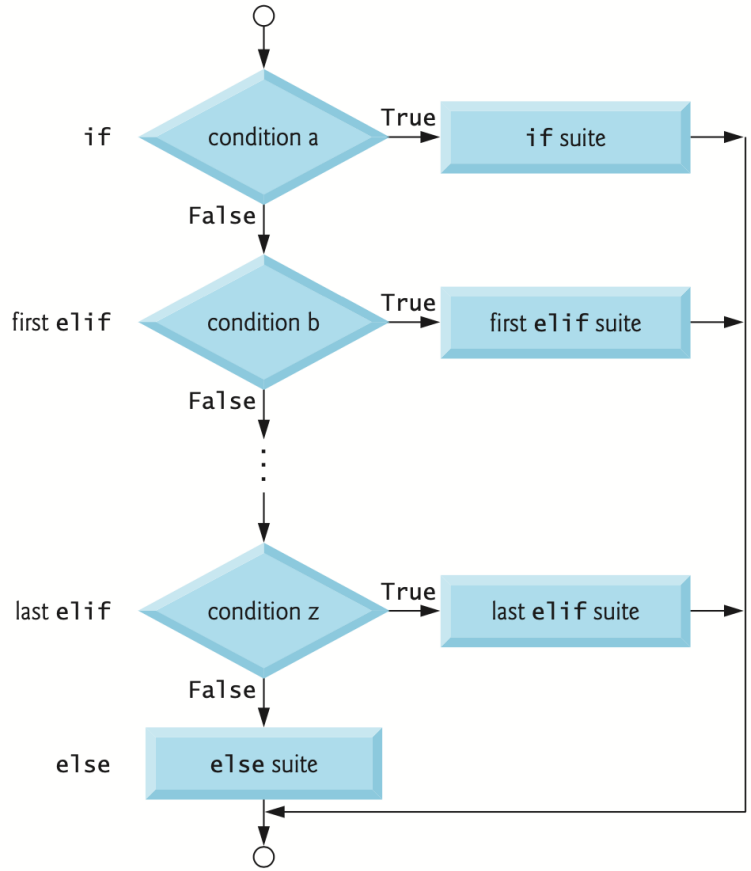
```
result = ('Passed' if grade >= 60 else 'Failed')
```

Multiple selection Statements

```
If student's grade is greater than or equal to 90
    Display "A"
Else If student's grade is greater than or equal to 80
    Display "B"
Else If student's grade is greater than or equal to 70
    Display "C"
Else If student's grade is greater than or equal to 60
    Display "D"
Else
    Display "F"
```

Multiple selection Statements

```
grade = 77
if grade >= 90:
    print('A')
elif grade >= 80:
    print('B')
elif grade >= 70:
    print('C')
elif grade >= 60:
    print('D')
else:
    print('F')
```



Programming Practice - I

What is your tuition fees?

This is your first trimester. Each trimester there is a trimester fee of 6500/- taka. Your admission fee was 20000/- taka and a caution money you paid was 2000/-. Per credit fee is 5525/- taka. You have taken some credits. Write a program that will take input how many credits you have taken and also if you are enjoying any waivers (25%, 50%, 75% or 100%). After that it will show the following:

- Your total payable in this trimester.
- Your payable before the first installment deadline.

Programming Practice - II

Running Competition

After a running competition, three runners want to determine who won based on the time they needed to complete the race. Write a script that inputs the time they took through three different floating-point numbers (in seconds) from the user.

- Find out who took the maximum time.
- Find our who took the minimum time.
- Display the numbers in increasing order.