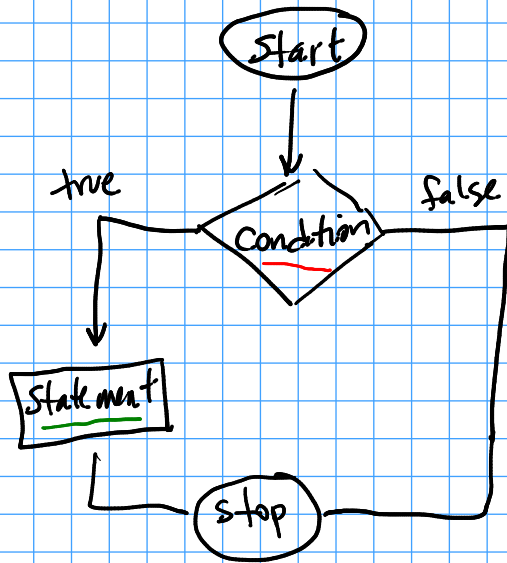


Lecture 5 - Conditional Statements

Outline

I. The "if statement"

* When we program, we want to make decisions



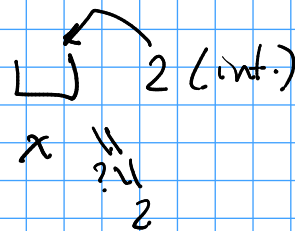
Logical flow of an if statement

* In python, we write this as:

```
if ( logical condition ):
```

```
    Statement      If statement
    tab (4 spaces)
```

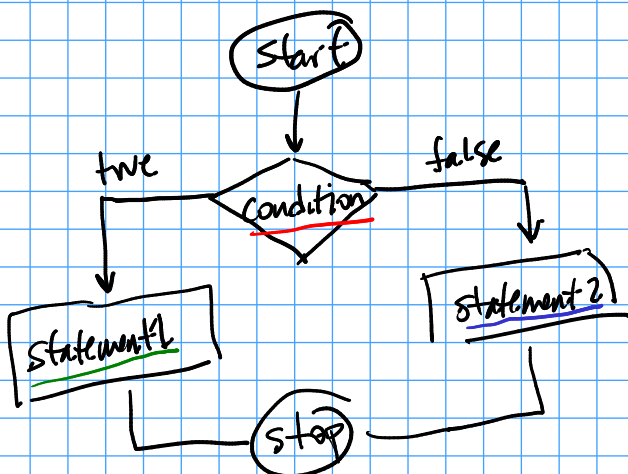
Example:
X = 2 ← assignment operator
if (x == 2): ← comparison operator
 print("equal")



2 == 2 → True

3 == 2 → False

* Suppose, I need this logical structure?



In Python

```
if ( condition ):
```

```
    Statement 1
```

```
else:
```

```
    Statement 2
```

"syntax"

If-else statement

Example

$x = 1$

if ($x < 2$):

print ("x less than 2")

else:

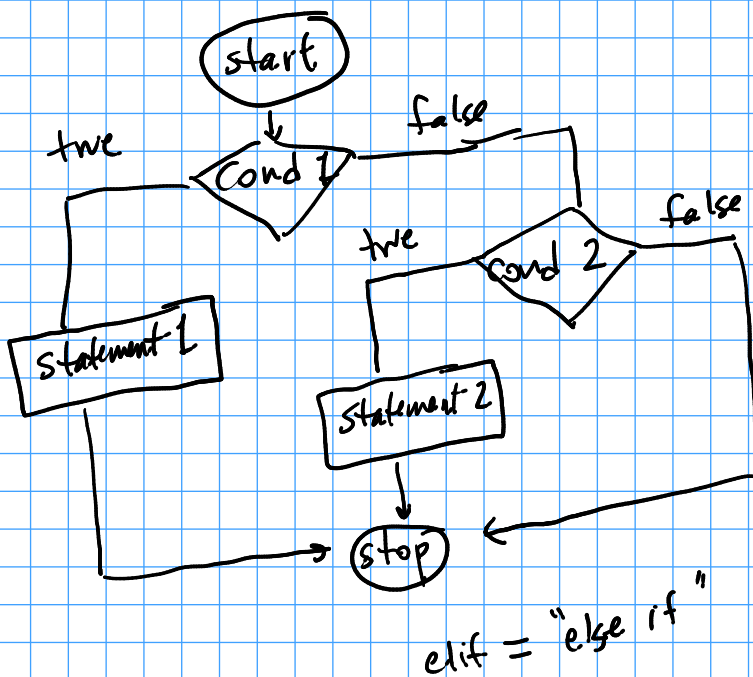
print ("x is greater than or equal to 2")

$x = 3$

print (x)

* Suppose I have multiple criteria:

(e.g. $x < 2$ and $x > 5$)



example:

$x = 7$

if ($x < 2$):

print ("x l.t. 2")

elif ($x > 5$):

print ("x g.t. 5")

$x < 2 \rightarrow 2 < 2 \rightarrow \text{False}$

> x less than 2

> 1

Python syntax:

if (cond 1):

└ Statement 1

else:

└ if (cond 2):

└ Statement 2

"nested if statement"

↑ inconvenient → all those tabs

Alternate syntax:

if (cond 1):

└ Statement 1

elif (cond 2):

└ Statement 2

$1 < 2 \rightarrow \text{true}$

else:

```
print("2 <= x <= 5")
```

II. Conditional operators

* There are logical operators & keywords that are useful in 'if' statements.

* True (1)
False (0)

x = True
if (True)
 False

(keywords)
1, 0

binary {
 and
 or

True & True → ?
True & False → ?

x = 6
x > 1 True
and
x > 5 True } True

unary {
 not

True and False → False
False and True → False
True and True → True

OR

x = 3
x > 1 True
or
x > 5 False → True

True or True → True
True or False → True
False or True → True
False or False → False

not True → False

not False → True

if (x > 1 or x > 5):

* comparison operators

Python

Excel

$==$	equals	$\longleftrightarrow$	$==$
$!=$	not equal	$\longleftrightarrow$	$<>$
$<$	less than		$<$
$>$	greater than		$>$
$<=$	less than or equal		$<=$
$>=$	greater than or equal		$>=$

$X \geq 1$

↓

True / False