

Syntax: conditional execution

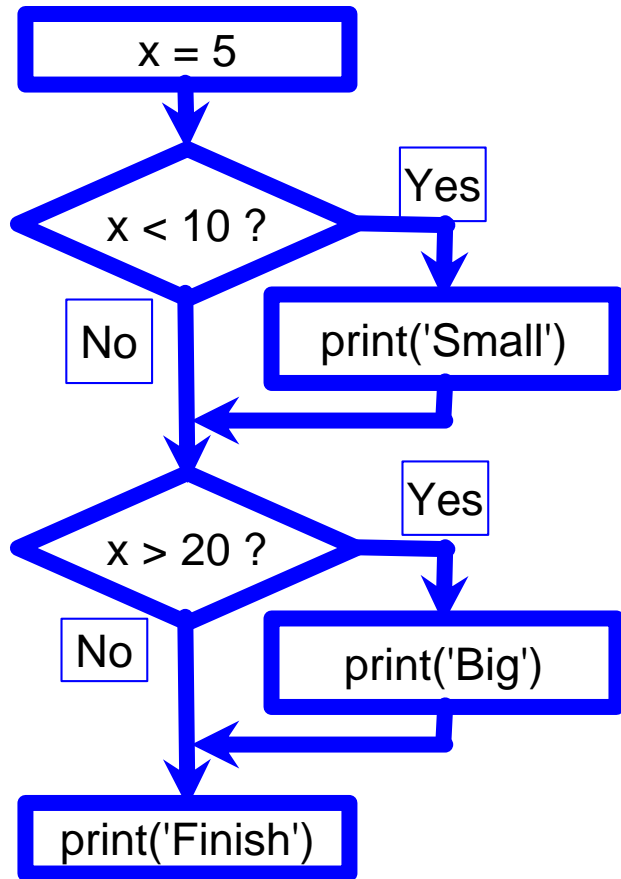
Lecture 02.03

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Conditional execution

if statement

Alternative paths through the program



Program:

```
x = 5
if x < 10:
    print('small')
if x > 20:
    print('big')
print('Finish')
```

Output:

small

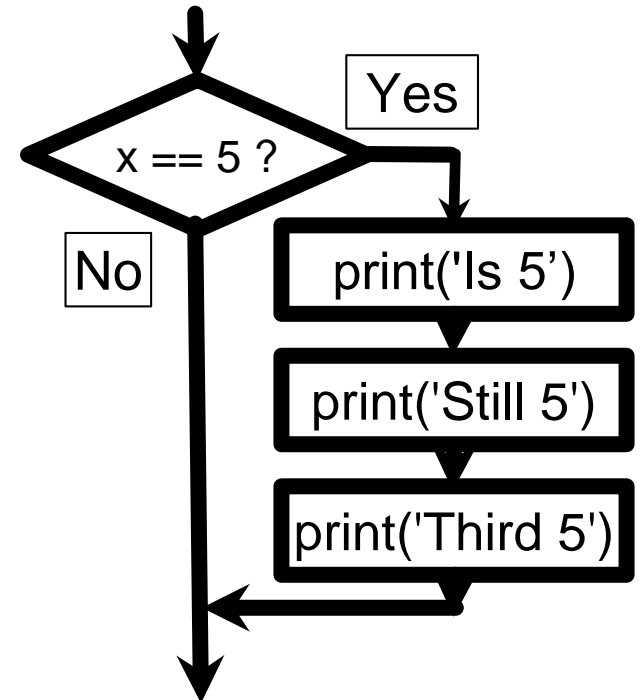
Finish

One-Way Deviations

x=5

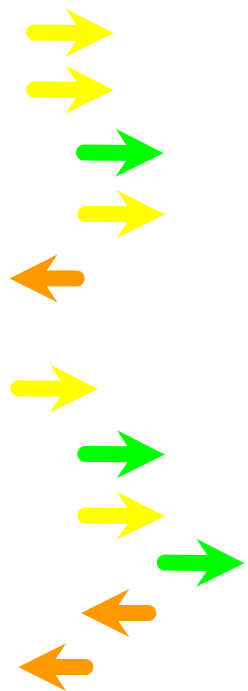
```
print('Before 5')
if x == 5 :
    print('Is 5')
    print('Is Still 5')
    print('Third 5')
print('Afterwards 5')
print('Before 6')
if x == 6 :
    print('Is 6')
    print('Is Still 6')
    print('Third 6')
print('Afterwards 6')
```

Before 5
Is 5
Is Still 5
Third 5
Afterwards 5
Before 6
Afterwards 6



Indentation

increase / maintain after if or for
decrease to indicate end of block



The diagram illustrates indentation changes with arrows pointing to the left or right of the code lines. Yellow arrows indicate the start of a block, green arrows indicate the continuation of a block, and orange arrows indicate the end of a block.

```
x = 5
if x > 2 :
    print('Bigger than 2')
    print('Still bigger')
print('Done with 2')

for i in range(5) :
    print(i)
    if i > 2 :
        print('Bigger than 2')
    print('Done with i', i)
print('All Done')
```

Think About begin/end Blocks

```
x = 5
if x > 2 :
    print('Bigger than 2')
    print('Still bigger')
print('Done with 2')
```

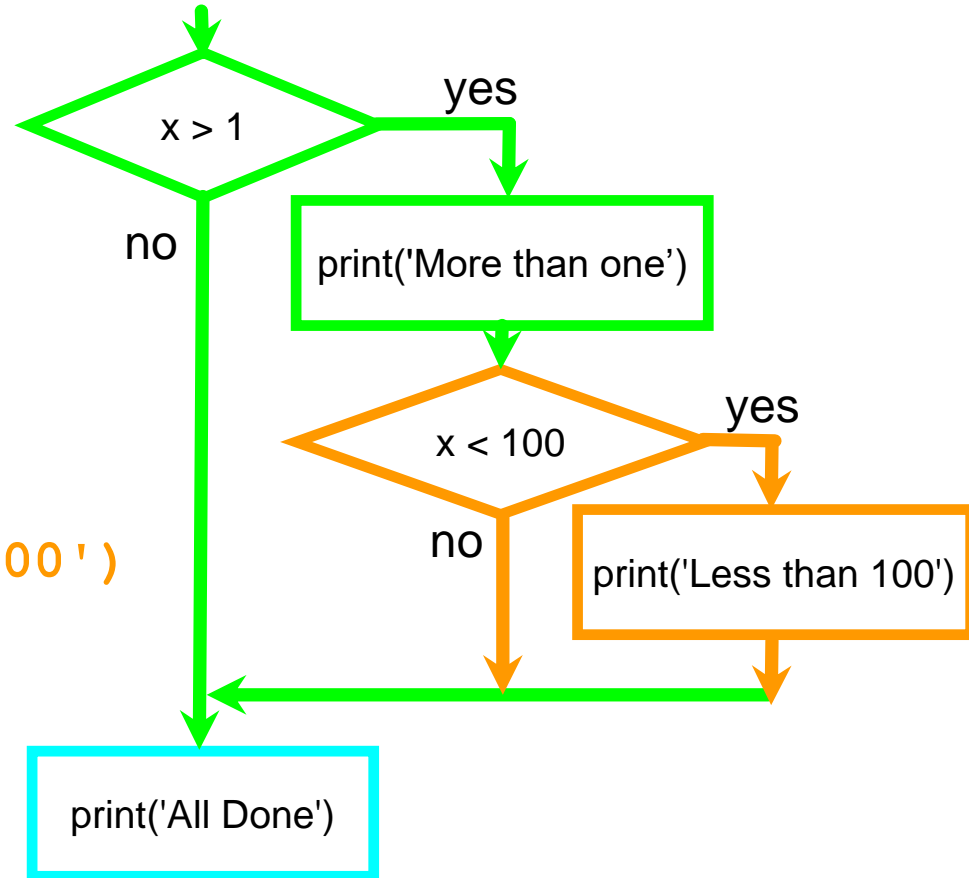
```
for i in range(5) :
    print(i)
    if i > 2 :
        print('Bigger than 2')
    print('Done with i', i)
print('All Done')
```

Warning: Turn Off Tabs!!

- Most text editors can turn tabs into spaces - make sure to enable this feature
- Python cares a *lot* about how far a line is indented. If you mix tabs and spaces, you may get “indentation errors” even if everything looks fine

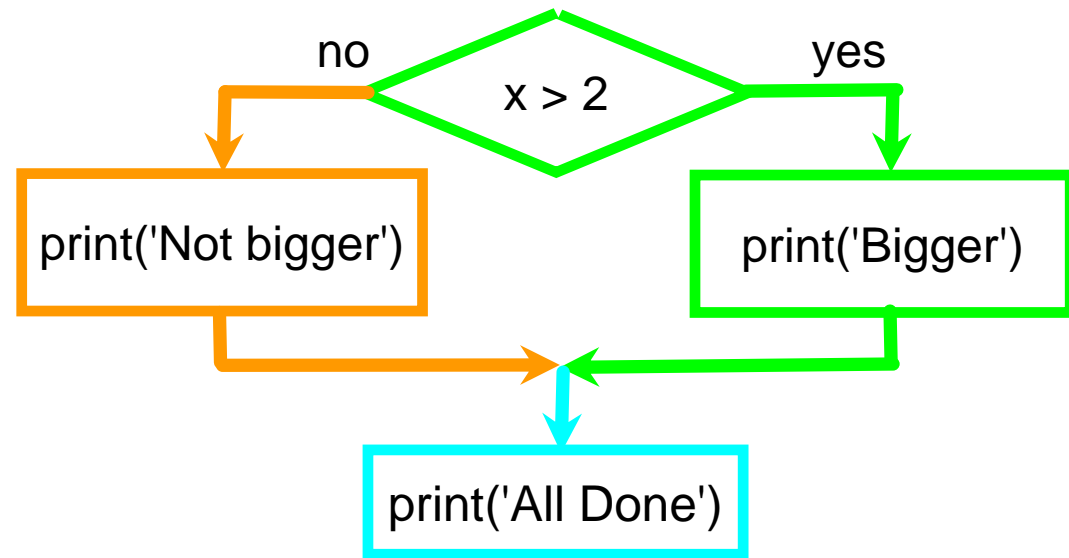
Nested sideroads

```
if x > 1 :  
    print('More than one')  
    if x < 100 :  
        print('Less than 100')  
print('All done')
```



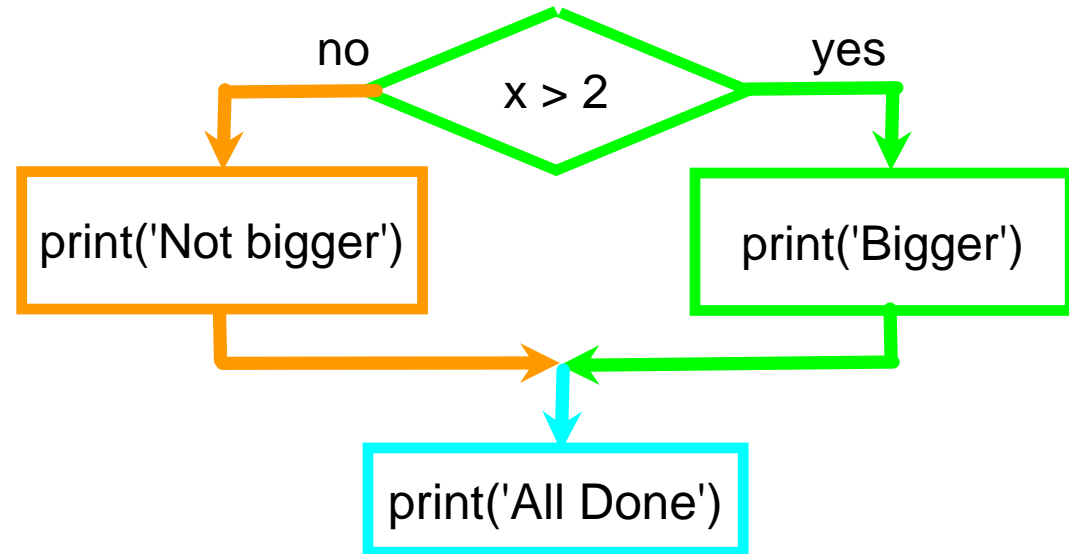
Two-way Deviations

- Sometimes we want to do one thing if a logical expression is true and something **else** if the expression is false
- It is like a fork in the road - we must choose one or the other path but not both



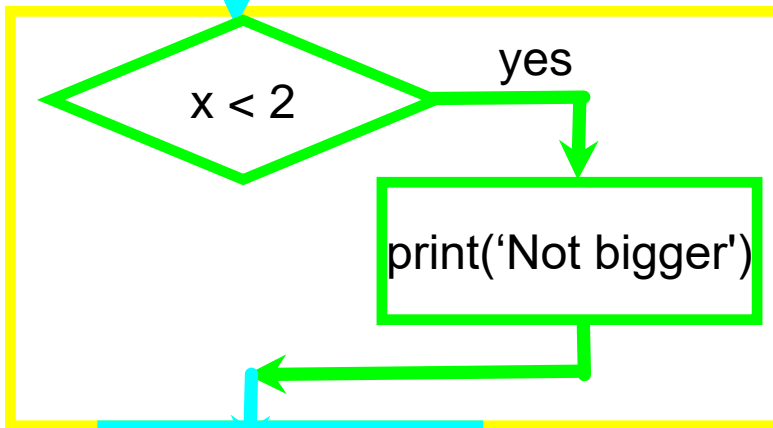
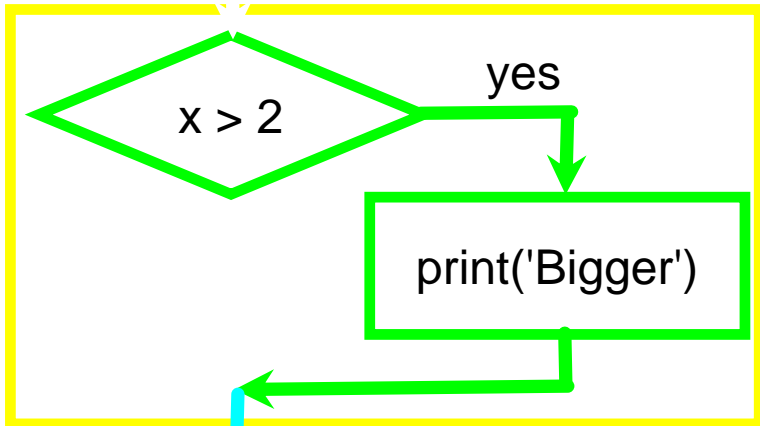
Two-way Deviations

```
if x > 2 :  
    print('Bigger')  
else :  
    print('Smaller')  
  
print('All done')
```

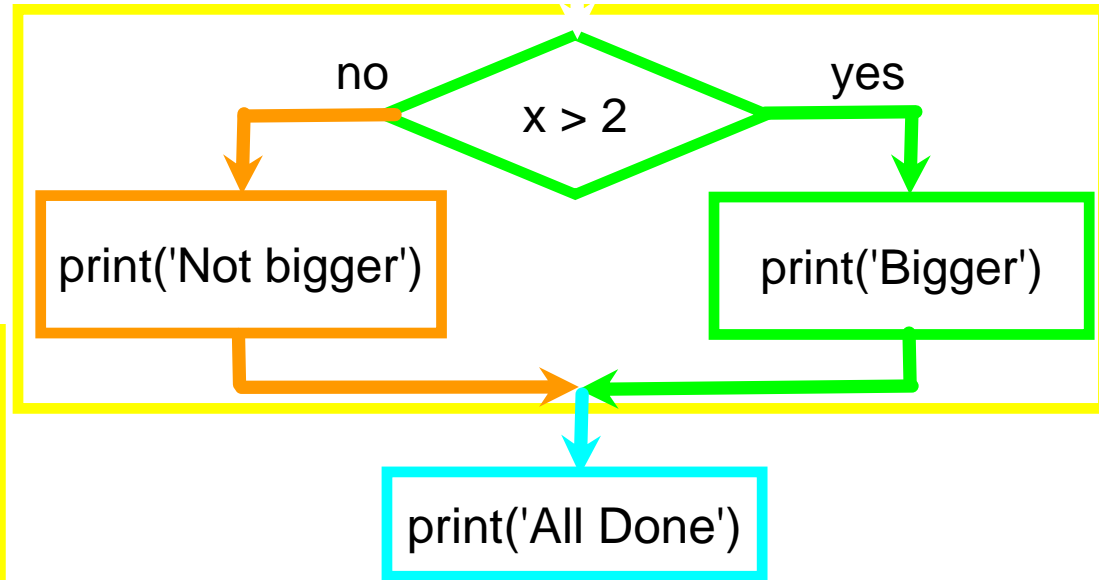


Compare: when the result is different?

x = 4

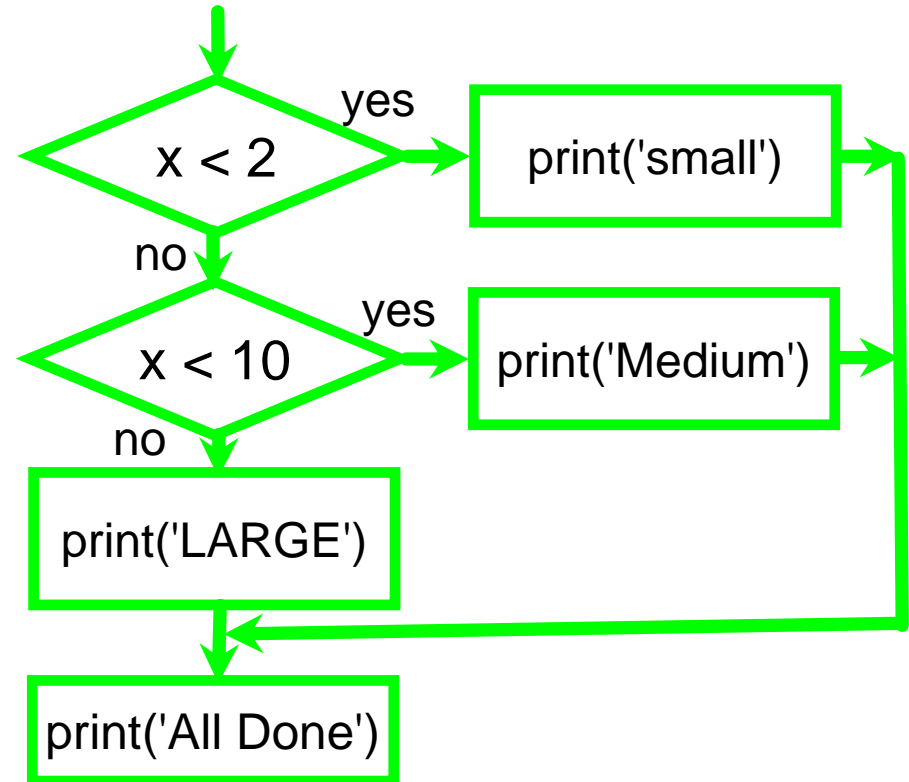


x = 4



Multi-way crossroads

```
if x < 2 :  
    print('small')  
elif x < 10 :  
    print('Medium')  
else  
    print('LARGE')  
Print {'All done)
```



Multi-way crossroads

```
# No Else
x = 5
if x < 2 :
    print('Small')
elif x < 10 :
    print('Medium')

print('All done')
```

```
if x < 2 :
    print('Small')
elif x < 10 :
    print('Medium')
elif x < 20 :
    print('Big')
elif x < 40 :
    print('Large')
elif x < 100:
    print('Huge')
else :
    print('Ginormous')
```