



Python Coding Schools

7th lesson: IF statement

Seed Academy

Agenda

- wk1. Installing Python, HelloWorld
- wk2. Arithmetic Operators
- wk3. Data Types : Integer, Floating point, Boolean, String
- wk4. Data Structures: List
- wk5. Data Structures: Set, Tuples
- wk6. Data Structures: Dictionary

Agenda

- wk7. Control flows: IF statement
- wk8. Loops
- wk9. Function
- wk10. Class
- wk11. Data Visualization

Class materials

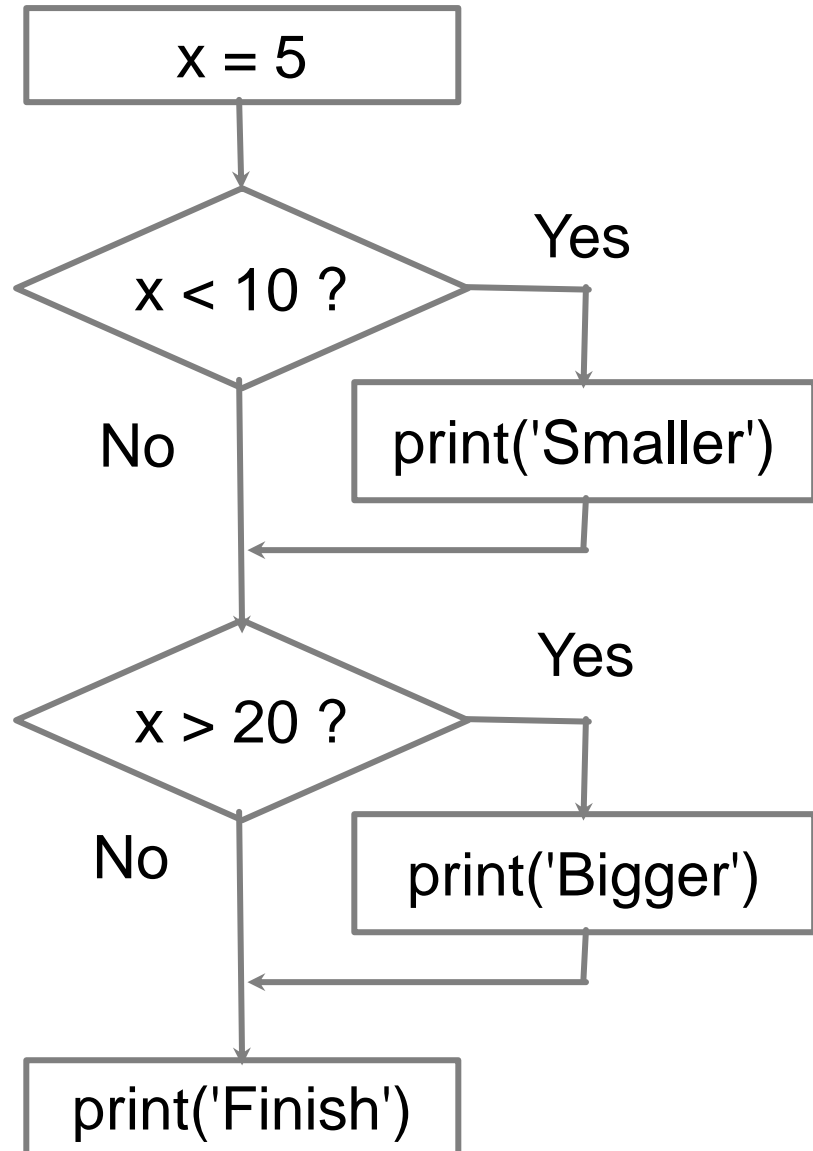
<https://github.com/TaeheeJeong/seedacademy>

<https://github.com/TaeheeJeong/SummerCoding2023>

Today's topic: Control flows

- Conditional: IF statement
- While Loop
- For Loop

Conditional Steps



Program:

```
x = 5
if x < 10:
    print('Smaller')
if x > 20:
    print('Bigger')

print('Finish')
```

Comparison Operators

- Boolean expressions ask a question and produce a Yes or No result which we use to control program flow
- Boolean expressions using comparison operators evaluate to True / False or Yes / No
- Comparison operators look at variables but do not change the variables

Python	Meaning
<	Less than
<=	Less than or Equal to
==	Equal to
>=	Greater than or Equal to
>	Greater than
!=	Not equal

Remember: “=” is used for assignment.

http://en.wikipedia.org/wiki/George_Boole

Comparison Operators

```
x = 5
if x == 5 :
    print('Equals 5')
if x > 4 :
    print('Greater than 4')
if x >= 5 :
    print('Greater than or Equals 5')
if x < 6 : print('Less than 6')
if x <= 5 :
    print('Less than or Equals 5')
if x != 6 :
    print('Not equal 6')
```


Indentation

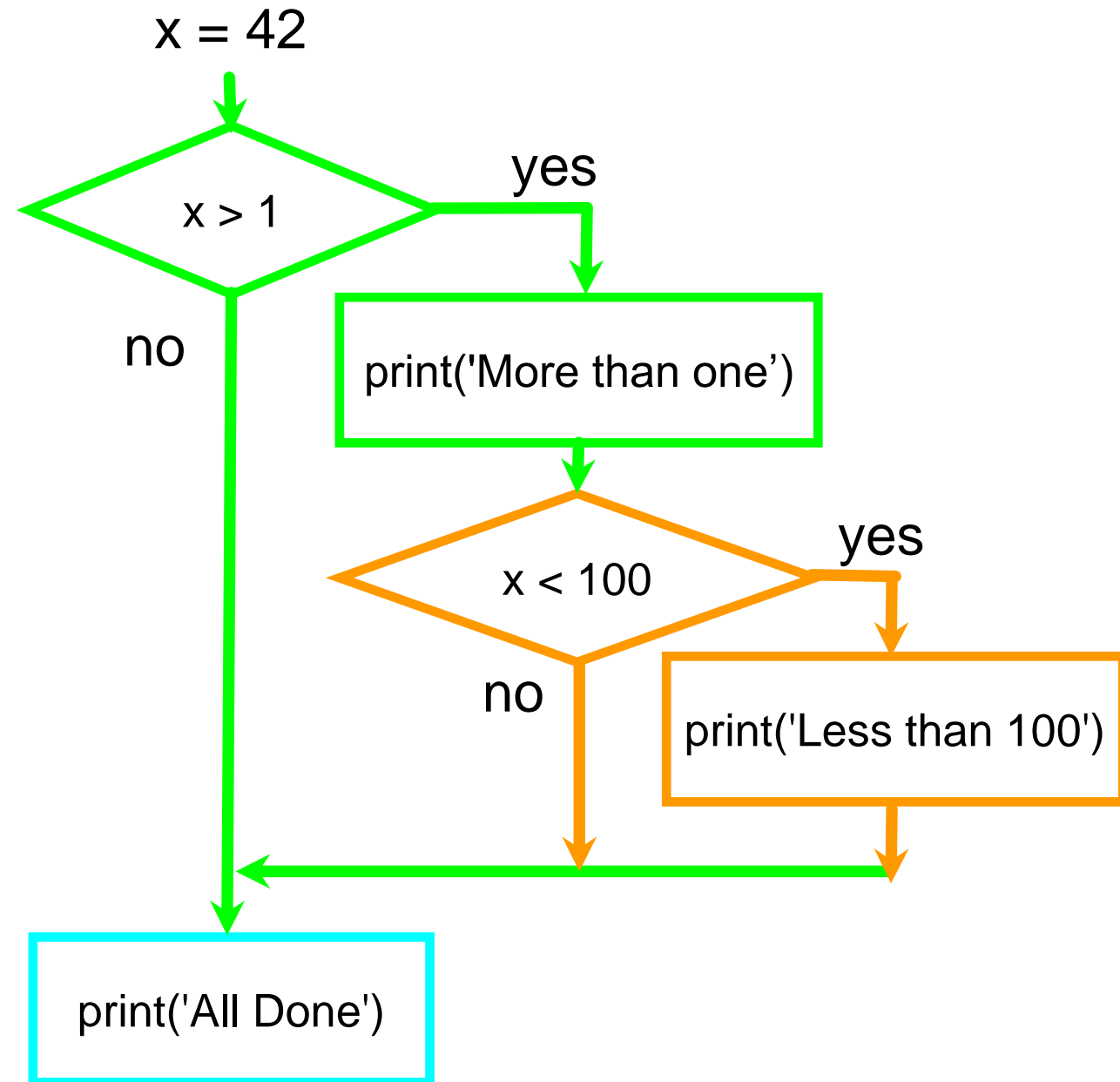
- Increase indent after an if statement or for statement (after :)
- Maintain indent to indicate the scope of the block (which lines are affected by the if/for)
- Reduce indent back to the level of the if statement or for statement to indicate the end of the block
- Blank lines are ignored - they do not affect indentation
- Comments on a line by themselves are ignored with regard to indentation

begin/end Blocks

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

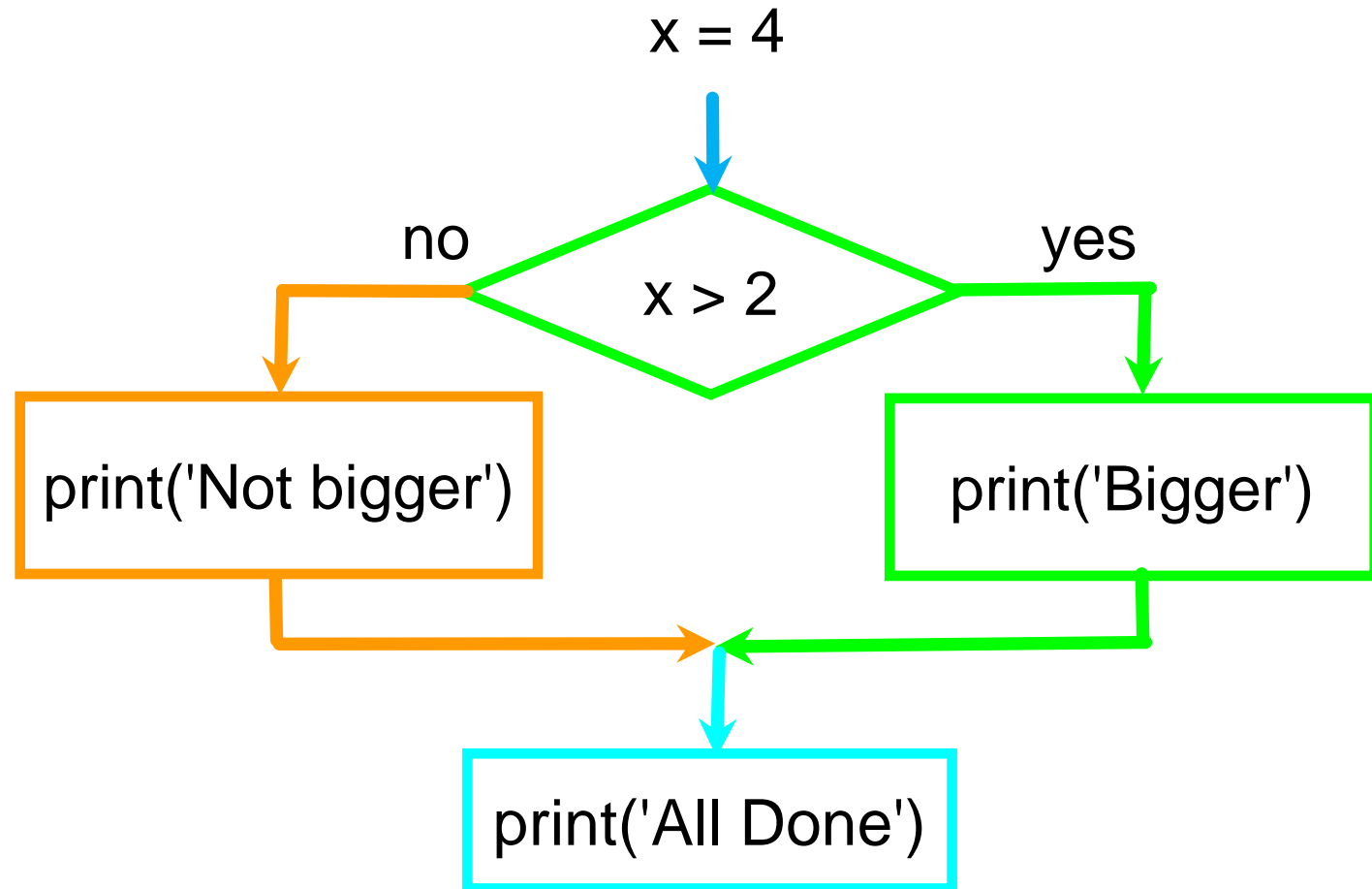
Nested Decisions

```
x = 42
if x > 1 :
    print('More than one')
    if x < 100 :
        print('Less than 100')
print('All done')
```



Two-way Decisions

- 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

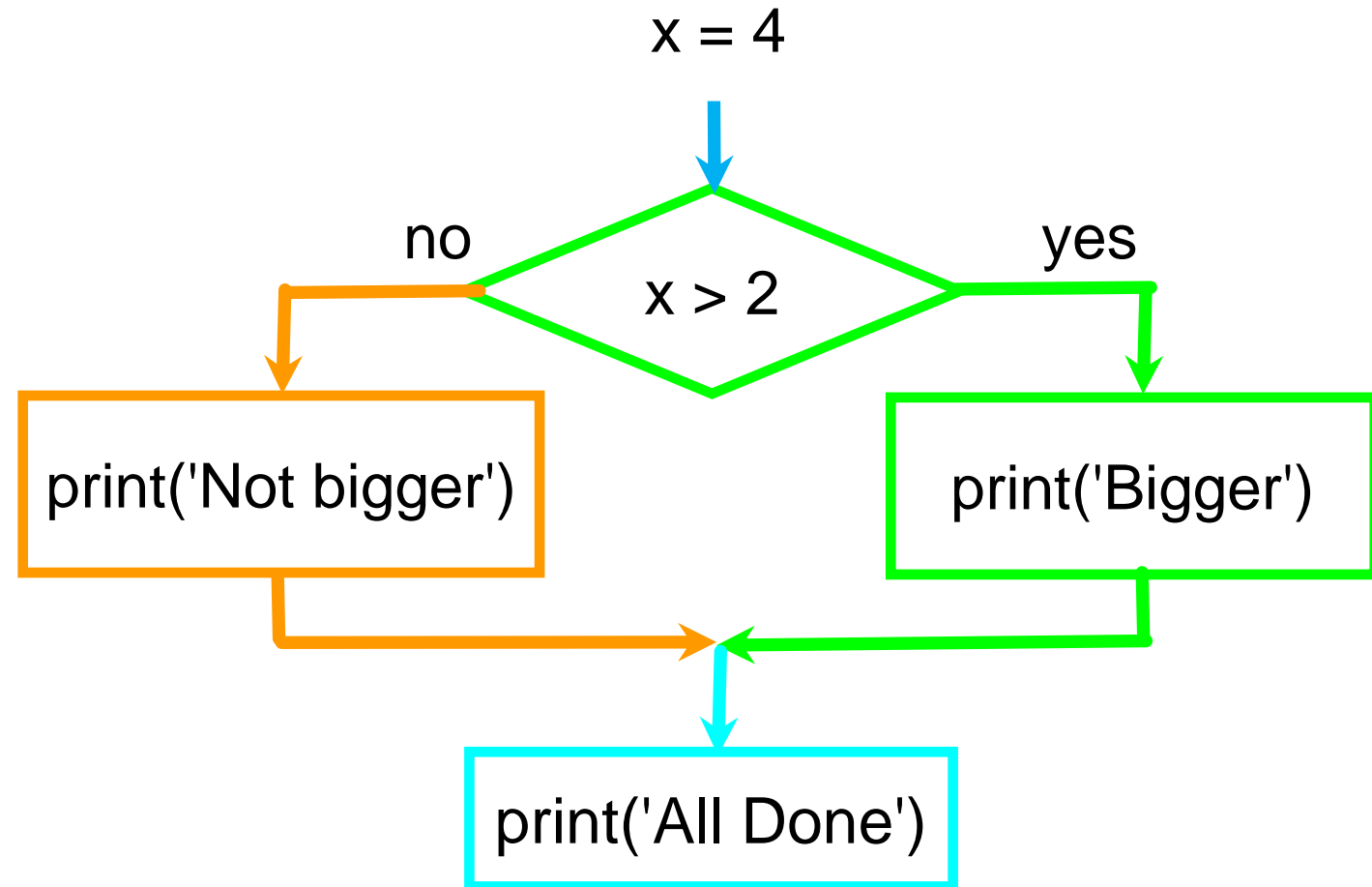


Two-way Decisions with else:

```
x = 4

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

print('All done')
```

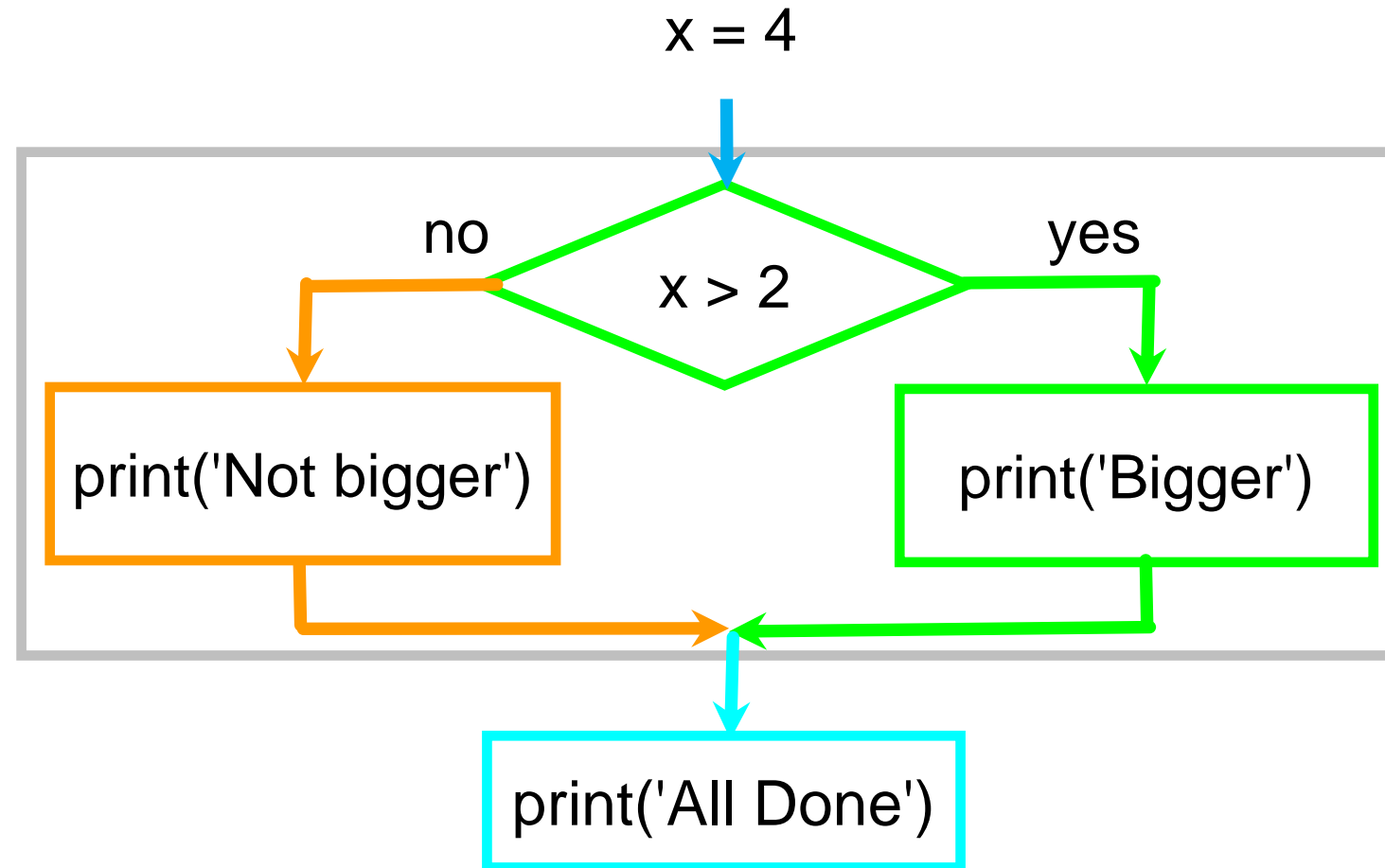


Visualize Blocks

```
x = 4

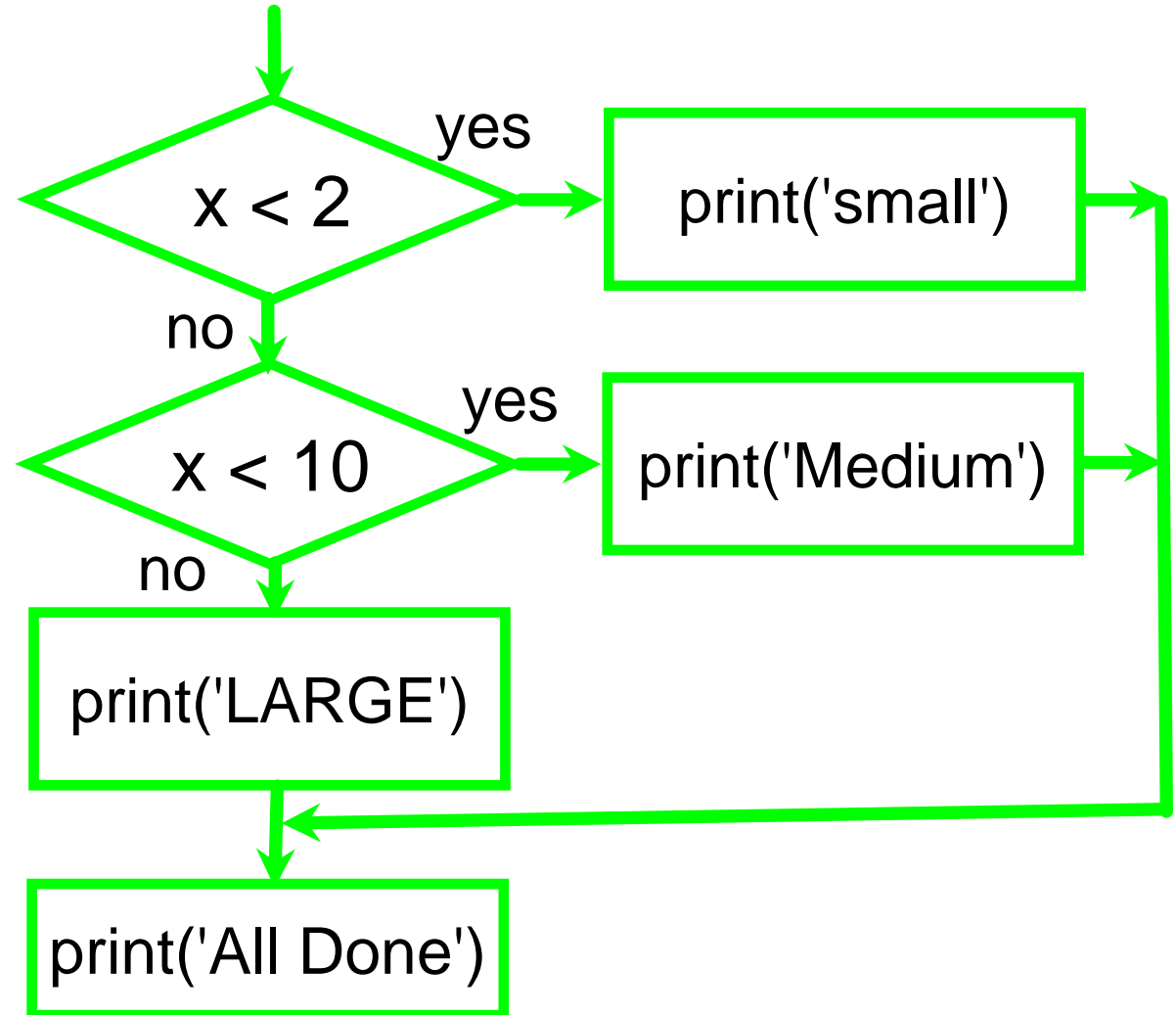
if x > 2 :
    print('Bigger')
else :
    print('Smaller')

print('All done')
```



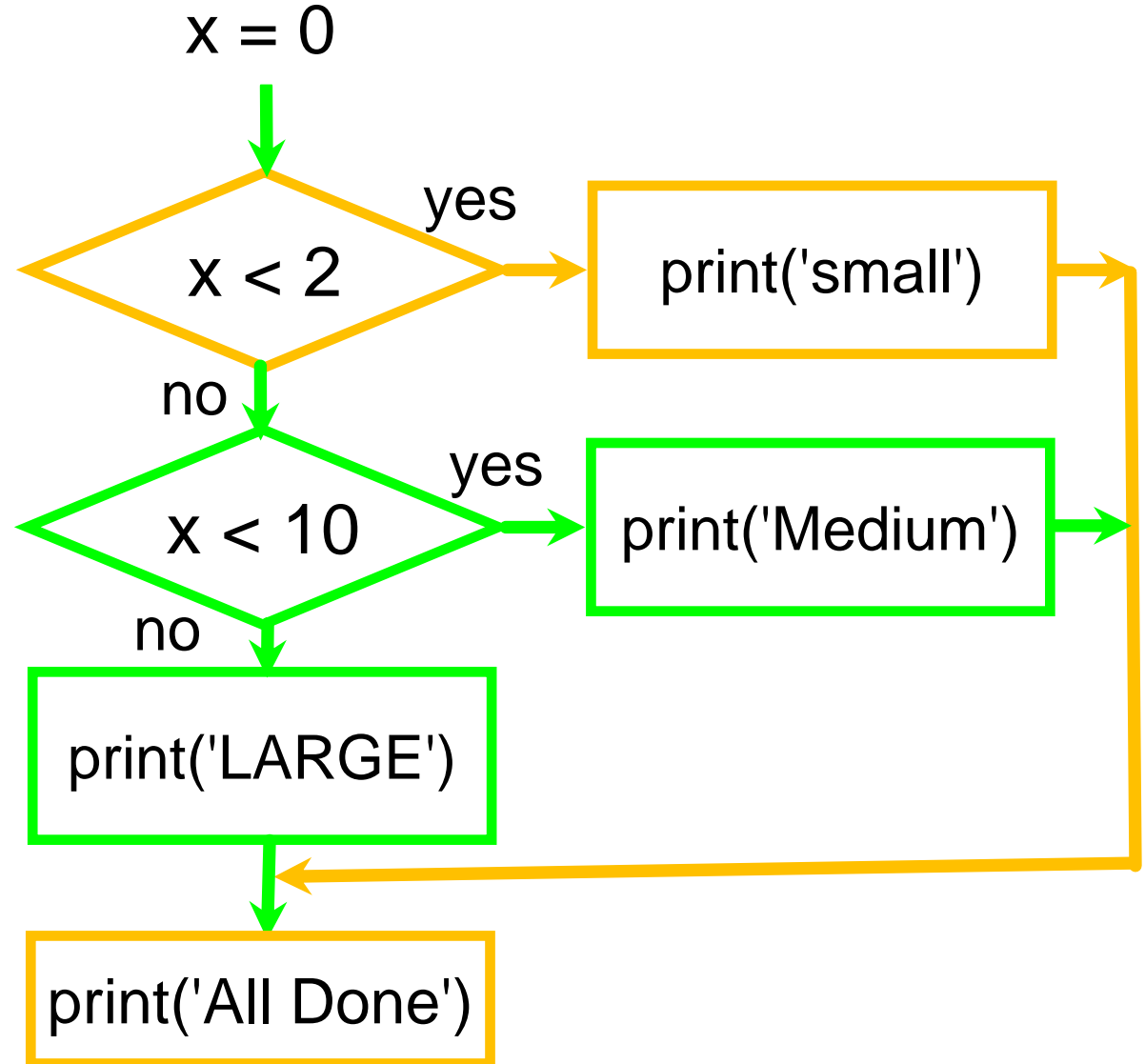
Multi-way

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



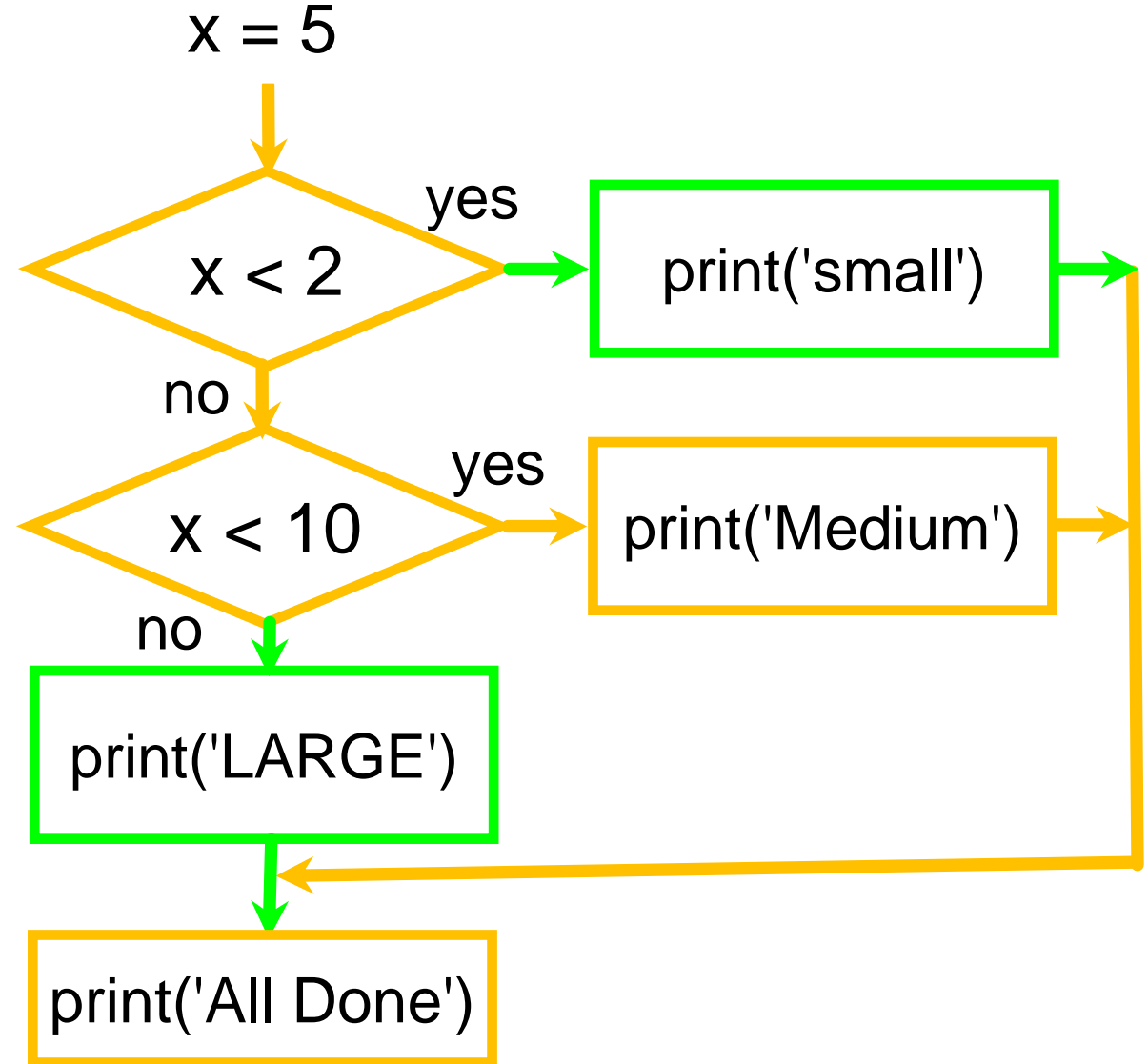
Multi-way

```
x = 0
if x < 2 :
    print('small')
elif x < 10 :
    print('Medium')
else :
    print('LARGE')
print('All done')
```



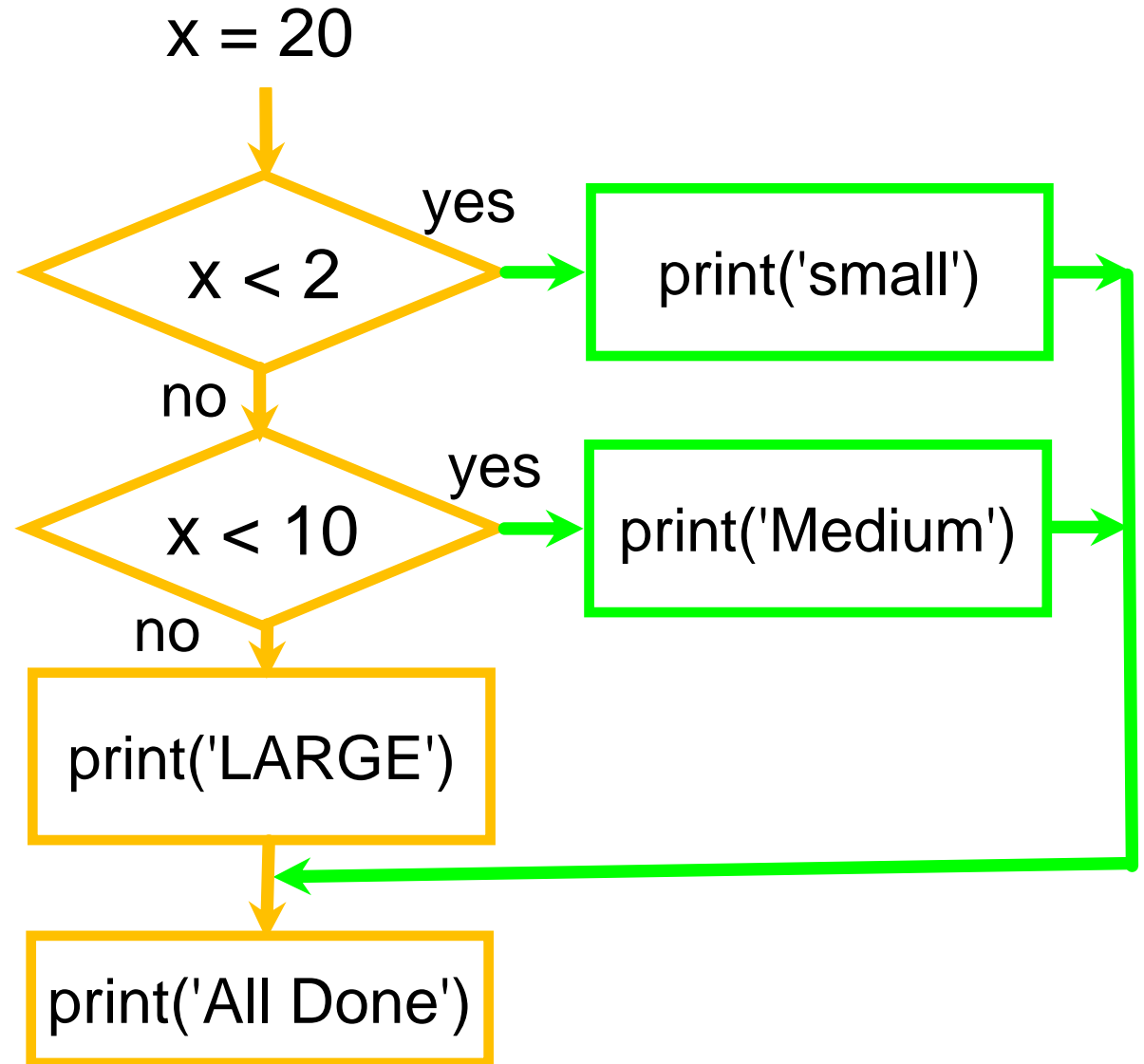
Multi-way

```
x = 5
if x < 2 :
    print('small')
elif x < 10 :
    print('Medium')
else :
    print('LARGE')
print('All done')
```



Multi-way

```
x = 20
if x < 2 :
    print('small')
elif x < 10 :
    print('Medium')
else :
    print('LARGE')
print('All done')
```



Multi-way

Without else

```
x = 5
if x < 2 :
    print('Small')
elif x < 10 :
    print('Medium')

print('All done')
```

With else

```
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')
```

Multi-way Puzzles

Quiz: Which will never print regardless of the value for x?

```
if x < 2 :  
    print('Below Two')  
elif x > 2 :  
    print('More than Two')  
else :  
    print('Something else')
```

```
if x < 2 :  
    print('Below 2')  
elif x < 20 :  
    print('Below 20')  
elif x < 10 :  
    print('Below 10')  
else :  
    print('Something else')
```

Recap: IF/Else statement

```
1 a = True
2 if a:
3     print('It is true!')
4     print('Also print this')
5 else:
6     print('It is false!')
7 print('Always print this')
```

Output

It is true!

Also print this

Always print this

Acknowledgements / Contributions



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Initial Development: Charles Severance, University of Michigan School of Information

Modification: Taehee Jeong, San Jose State University