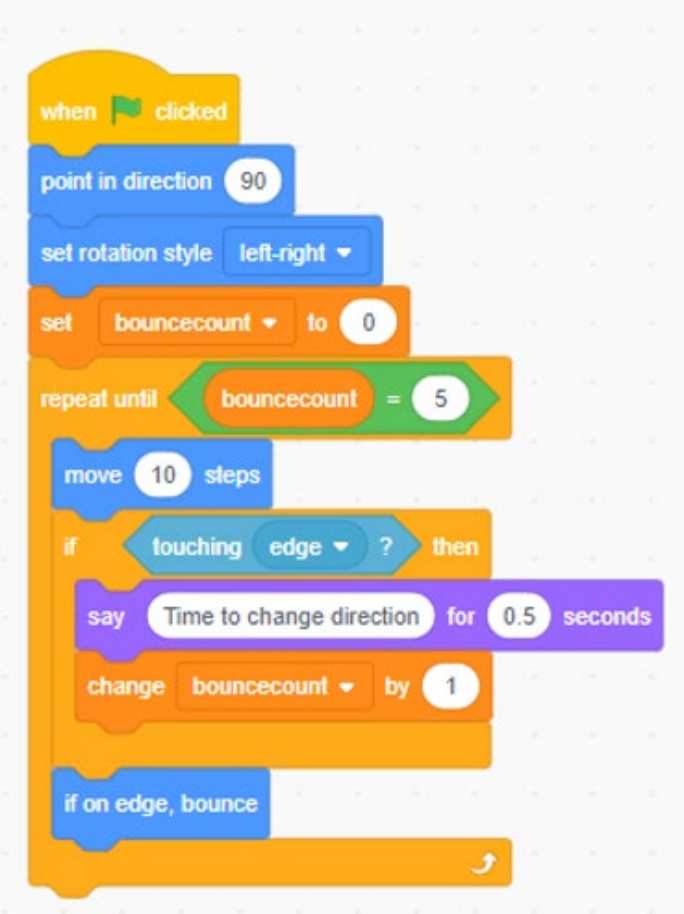
CompSci 101
Part 1 of 5:
main and import

KISS Principle

- Think of the non-computing context for any word/terms
- Keep It Simple, Stupid (US Navy-1960s)
  - Work smarter, not harder!!
- “Good programmers are simply good designers.”
  - *-Dr. Washington*
- Design first and always!
- Importance of reusability

main

- Python modules
  - *.py files
- Modules are either:
  - Stand-alone
    - Control the program execution
  - Imported
    - Used in another stand-alone module



```python
"""
Created on 1/25/2021

@author: alici
"""

if __name__ == '__main__':
    pass
```

```python
def output(value):
    print("Number=" + str(value))


if __name__ == '__main__':
    number = 10
    output(number)
```

CompSci 101
Part 2 of 5:
main and import

import

- Real-world example:
  - Importing vs. exporting goods.
- What does import mean in Python?
- Why would you want/need to import a module?
  - KISS principle
  - Reusability
  - e.g., calculate square root, cosine, floor, etc.
- Python Standard Library
  - BOOKMARK THIS ON YOUR BROWSER!
    - https://tinyurl.com/kt4ogfu

Sample Code

```
"""
Created 1/25/2021
@author: anw
"""
import module_name

if _ _name_ _ = = '_ _main_ _':
        print(module_name.function_name(arguments))
```

```
import math

if __name__ == '__main__':
    print(math.floor(6.3333345))
```

Can we only import modules from the Python Standard Library?

```python
def output_num(value):
    print("The value from your main code was "+str(value))
```

Module named mymodule.py

```python
def output(value):
    print("Number=" + str(value))

if __name__ == '__main__':
    number = 20
    output(number)
```

Module named test.py
we want to import mymodule into here and use the output_num function

```python
import mymodule

def output(value):
    print("Number=" + str(value))

if __name__ == '__main__':
    number = 20
    output(number)
    mymodule.output_num(number)
```

Updated test.py
imports mymodule to use output_num() function

CompSci 101
Part 3 of 5:
random module

random module

- When would using random numbers be applicable?
  - Games: Rolling dice, spinning a wheel
- Rolling dice
  - Options: One die displays 1-6
  - How do we recreate this in Python?
- KISS/Reusability
  - import statement
  - random module (built-in Python functionality)
    - Python Standard Library-https://tinyurl.com/kt4ogfu

How does it work?

- random() function

```
import random


def output(value):
    print("Number=" + str(value))

if __name__ == '__main__':
    number = random.random()
    output(number)
```

- NOTE: number is in [0.0, 1.0)

- randint() function

```
import random


def output(value):
    print("Number=" + str(value))

if __name__ == '__main__':
    number = random.random()
    output(number)

    number = random.randint(1, 5)
    output(number)
```

- NOTE: number is in [1, 5]

CompSci 101
Part 4 of 5:
Relational and logic operators

Boolean Logic

AND

x	y	xy
0	0	0
0	1	0
1	0	0
1	1	1

OR

x	y	$x+y$
0	0	0
0	1	1
1	0	1
1	1	1

Boolean values in Python

- True or False
  - Case matters!!
- Relational operators
  - x == y
  - x != y
  - x > y
  - x < y
  - x >= y
  - x <= y

```
if __name__ == '__main__':
    num1 = 3
    num2 = 4

    print(num1 == num2)
    print(num1 != num2)
    print(num1 > num2)
    print(num1 < num2)
    print(num1 >= num2)
    print(num1 <= num2)
```

Comparing Logical Expressions

- and, or, not

- Expression 1 and Expression 2
- Expression 1 or Expression 2
- not Expression 2
- Remember order of precedence
  - PEMDAS
  - Relational (==, !=, >, <, >=, <=)
  - Logical (and, or, not)

```
if __name__ == '__main__':
    num1 = 6
    num2 = 4

    print(num1 > 5 and num1 == 10)

    print(num2 > 5 or (num2 % 2 == 0))

    print(not(num2 <= 5))
```

CompSci 101
Part 5 of 5:
Conditionals

Conditionals

Conditionals: You can’t have it both ways!

- If condition is true→action1
- Or else→action2

if *condition1*:
    block1
else:
    block2

```
if __name__ == '__main__':
    num1 = 7

    if num1 == 5:
        print("The number is 5!")
    else:
        print("The number is NOT 5!")
```

What if there are more forks in the road?

- If condition is true→action1
- Or else
  - If new condition is true→action2
  - Or else→action3

if *condition1*:
    block1
else:
    if *condition2*:
        block2
    else:
        block3

```
if __name__ == '__main__':
    num1 = 5

    if num1 == 5:
        print("The number is 5!")
    else:
        if num1 < 5:
            print("The number is less than 5!")
        else:
            print("The number is greater than 5!")
```

if…elif…else

- If condition is true→action1
- Or else if new condition is true→action2
- Or else→action3

if *condition1*:

    block1

elif *condition2*:

block2

else:

    block3

```
if __name__ == '__main__':
    num1 = 5

    if num1 == 5:
        print("The number is 5!")
    else:
        if num1 < 5:
            print("The number is less than 5!")
        else:
            print("The number is greater than 5!")
```

```
if __name__ == '__main__':
    num1 = 2

    if num1 == 5:
        print("The number is 5!")
    elif num1 < 5:
        print("The number is less than 5!")
    else:
        print("The number is greater than 5!")
```

Do you always need an elif or else?

- if condition is true→action1
- …remainder of program….

if *condition1*:
    block1
Program code

```
if __name__ == '__main__':
    num1 = 2

    if num1 == 5:
        print("The number is 5!")

    num2 = num1 + 3
    print(num2)
```