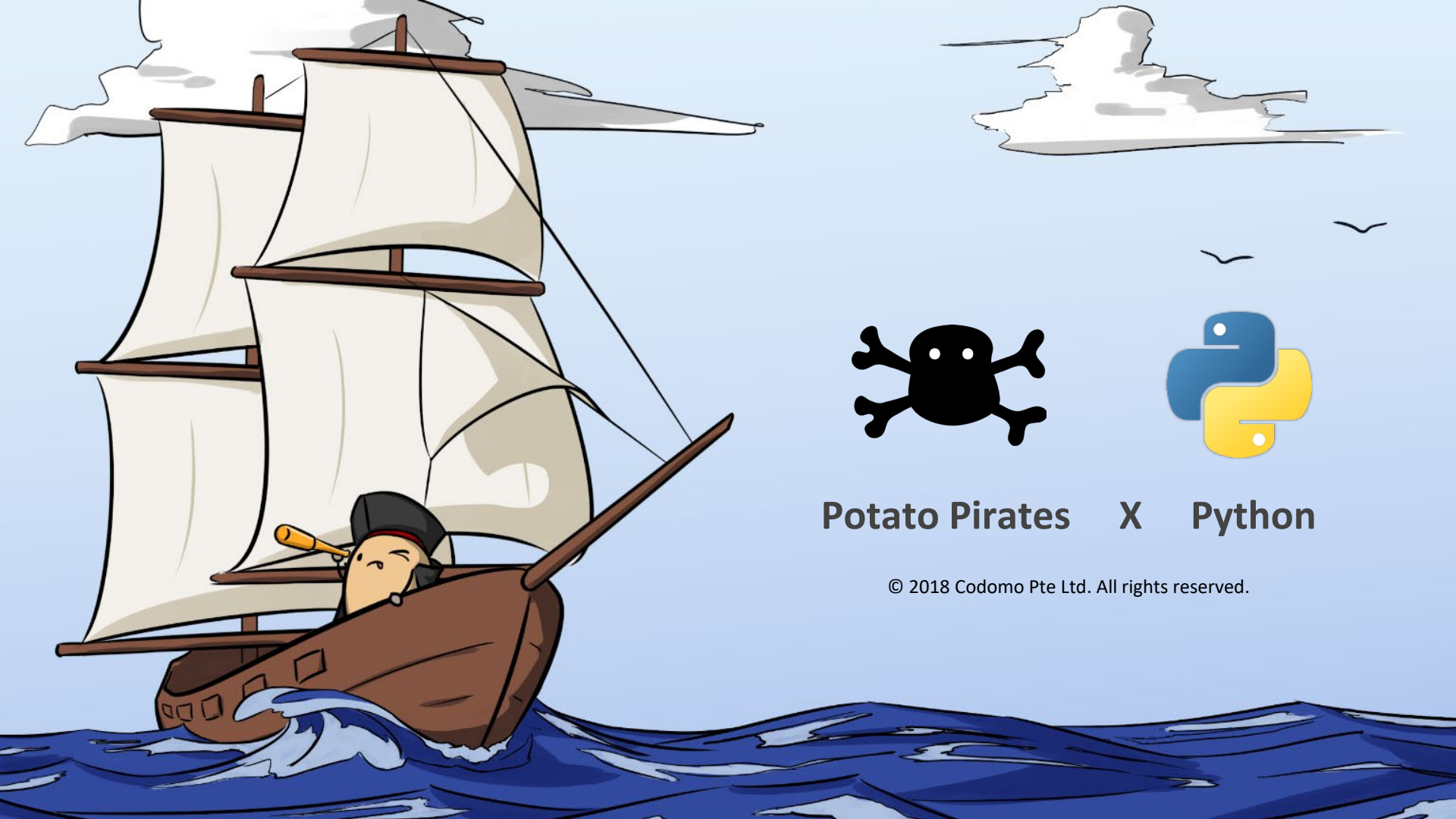
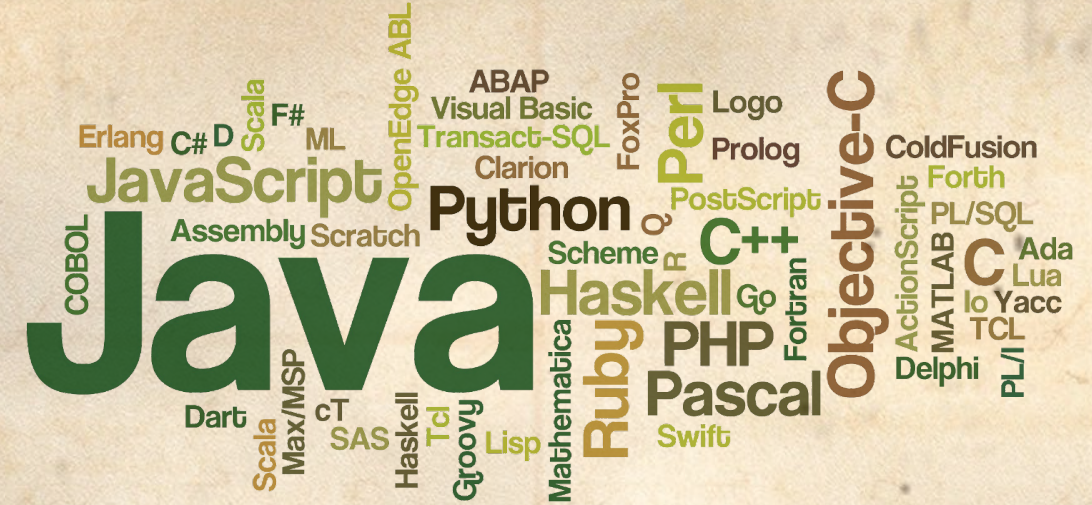


Potato Pirates X Python

Introduction to Python



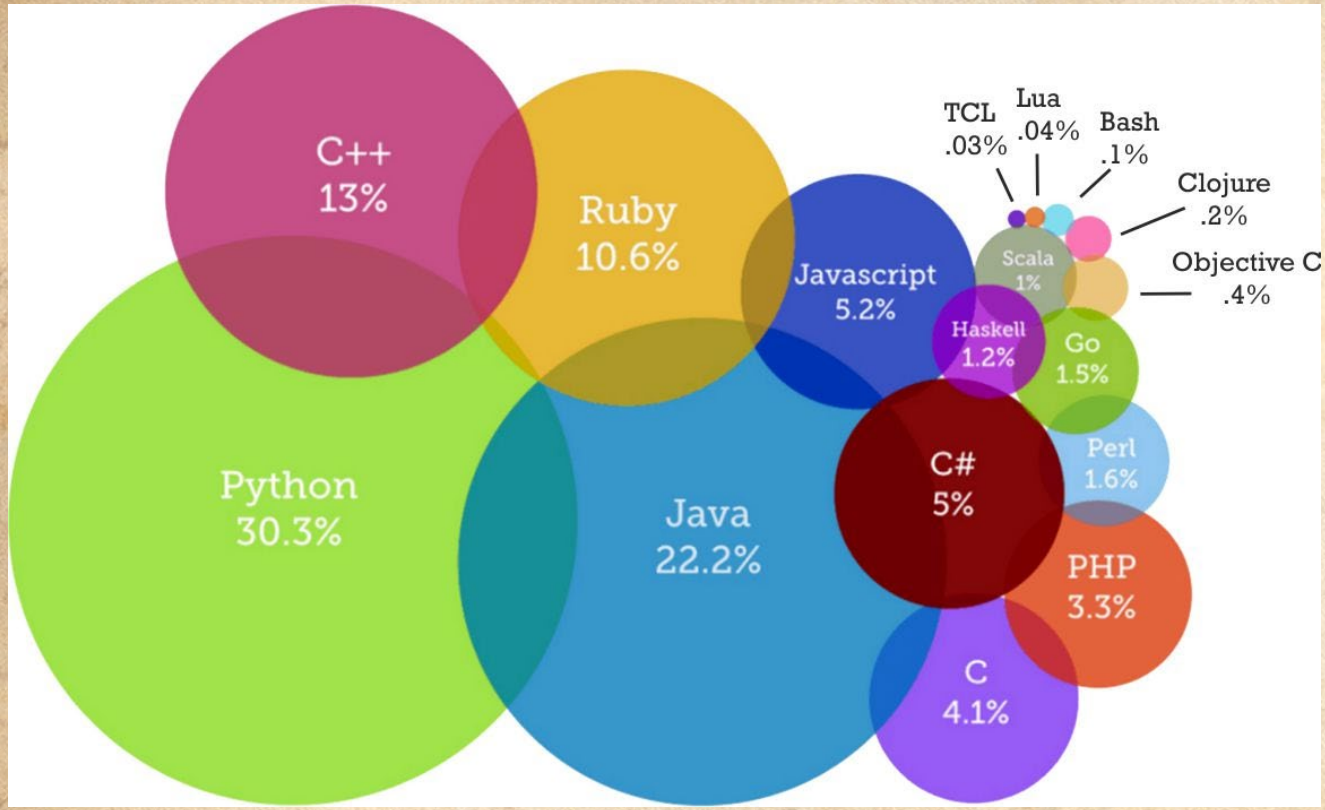
Programming languages allow you to ‘speak’ to computers.

Introduction to Python - *Why Python?*

potato pirates

- Easy to learn
- Common programming concepts
- Versatile
- One of the most popular coding languages

Most Popular Coding Language



Source: codeeval.com

Introduction to Python - *Real World Application*

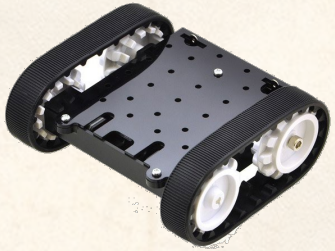
Introduction to Python - *Real World Application*

Web Development

Data Analytics

Game Development

Machine Learning



Robotics

Task Automation

Introduction to Python - *IDLE*

Opening Python IDLE
(**I**ntegrated **D**eve**L**opment **E**nvironment)

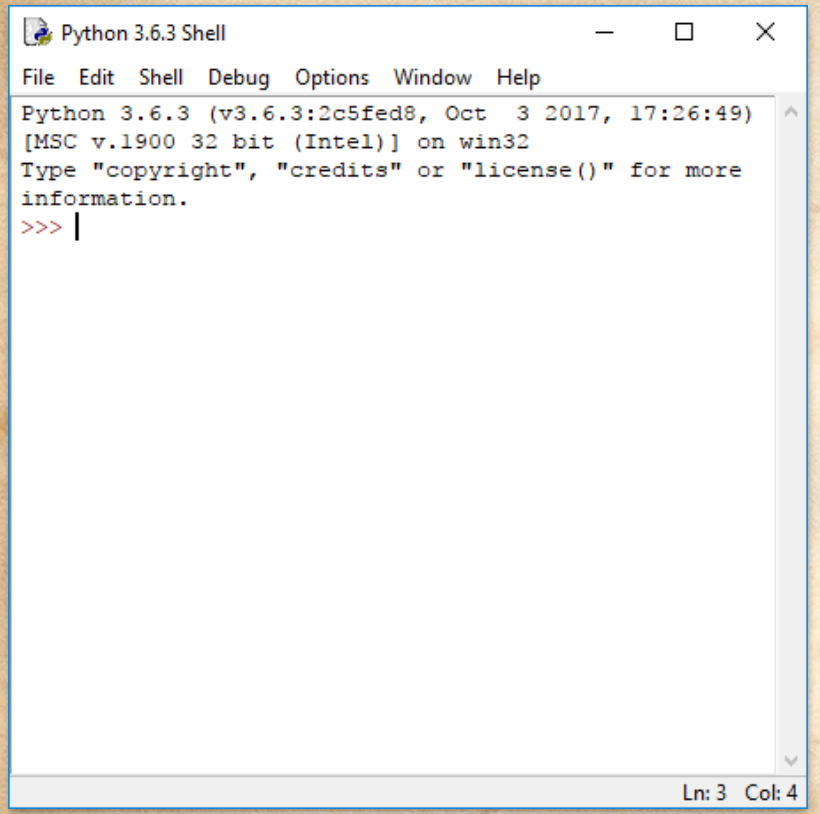
Press the **Windows Key** and **S**.

Enter **idle** and press **Enter**.

Press **Cmd** and **Space**.

Enter **idle** and press **return**.

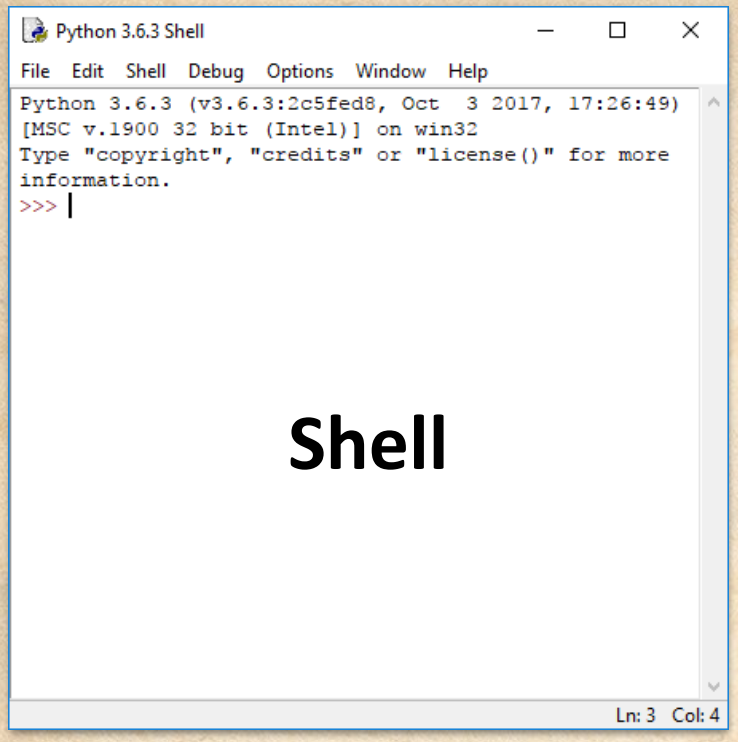
Introduction to Python - *Python Shell*

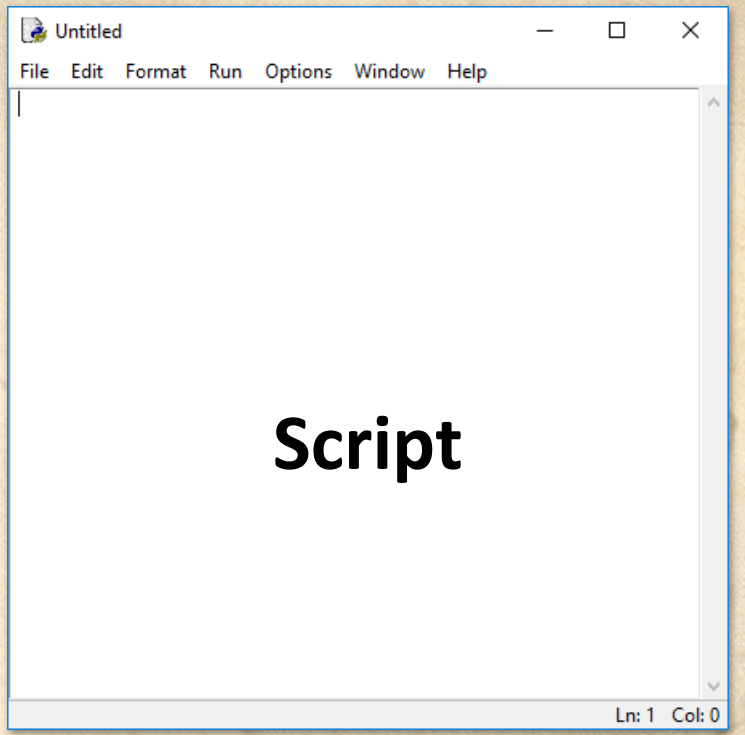


You should see this. This is the Python **Shell.**

Now, press **Ctrl + N** to open the Python **Script**.

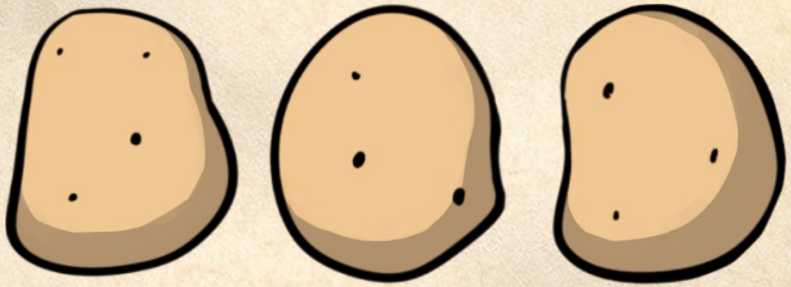
Introduction to Python - *Shell vs Script*

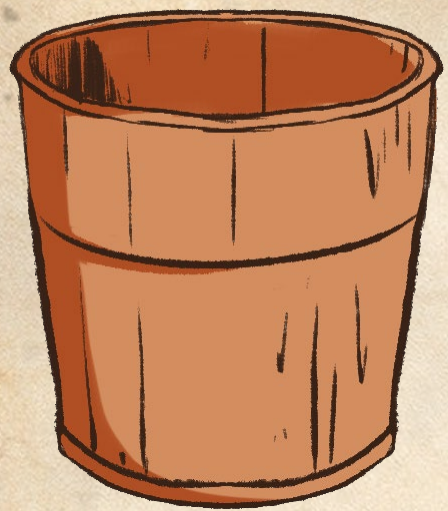




Chapter **1**

Variables





Variables

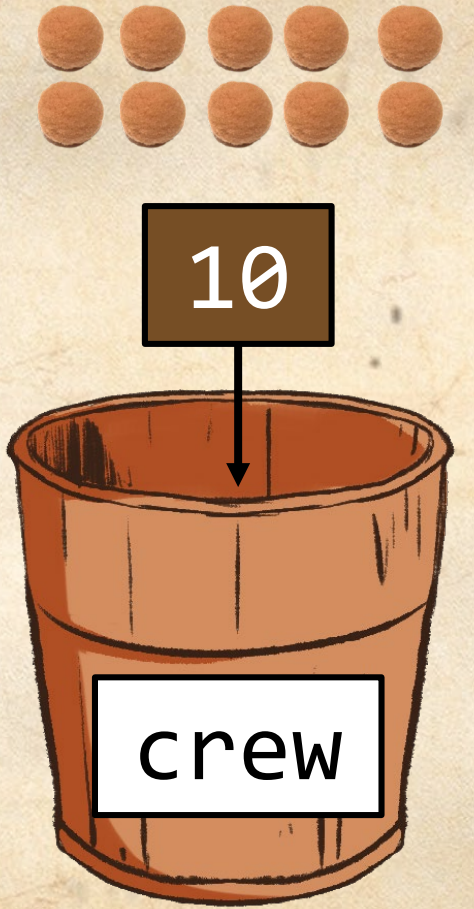
Variables - *what are they?*

Variables are like labels for buckets.

Each bucket has a unique name.

You can store data in buckets.

```
crew = 10
```



Variables -*Why do we use variables?*

Data keeps changing!

Variables can be updated to keep track of those changes.

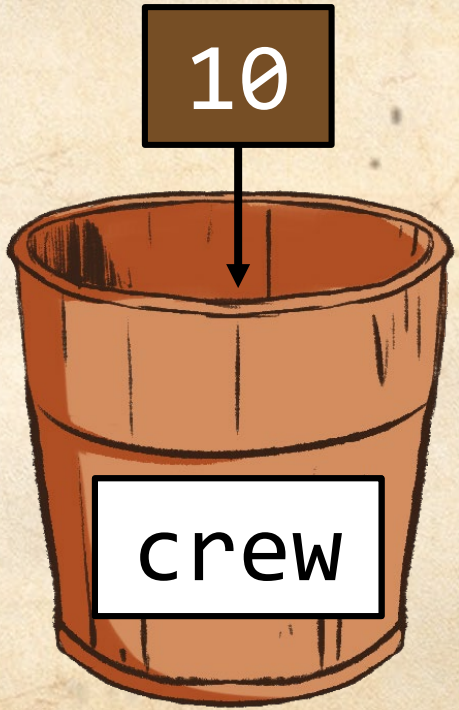
Variables -*Creating a Variable*

In Python, we save variables like this:

```
>>> crew = 10
```

The = sign is used to save variables.

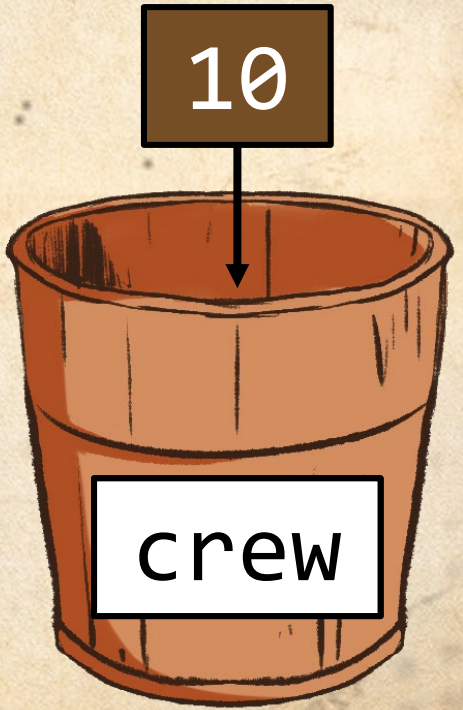
Try it out now on the **Python Shell**!



Variables -*Calling a Variable*

In Python, to recall the name of a variable, type the name of the variable into the shell.

```
>>> crew
10
```



Variables - *Mini Activity*

Add **2** to **crew** in **Python Shell.** Guess the output.

```
>>> crew + 2
??
```

Variables - *Mini Activity*

Add **2** to **crew** in **Python Shell.** Guess the output.

```
>>> crew + 2
12
```

As expected, the output is **12**.

Variables - *Mini Activity*

Add **2** to **crew** in **Python Shell.** Guess the output.

```
>>> crew + 2
12
```

Now, predict what happens if we type in **crew.**

```
>>> crew
??
```

Variables - *Mini Activity*

Add **2** to **crew** in **Python Shell.** Guess the output.

```
>>> crew + 2
12
```

Now, predict what happens if we type in **crew.**

```
>>> crew
10
```

Didn’t we just add **2** to **crew** just now?

Variables - *Mini Activity*

When you want to change the value stored inside a variable, you have to use the “=” sign!

The = sign represents saving a value.

Variables - *A closer look*

```
>>> crew = 10
```

potato pirates

Variables - *A closer look*

```
>>> crew = 10

>>> crew + 2
```

potato pirates

Variables - *A closer look*

```
>>> crew = 10

>>> crew + 2
12
```

potato pirates

Variables - *A closer look*

```
>>> crew = 10

>>> crew + 2
12

>>> crew
```

potato pirates

Variables - *A closer look*

```
>>> crew = 10

>>> crew + 2
12

>>> crew
10
```

potato pirates

Variables - *A closer look*

```
>>> crew = 10

>>> crew + 2
12

>>> crew
10

>>> crew = crew + 2
```

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Variables - *A closer look*

```
>>> crew = 10

>>> crew + 2
12

>>> crew
10

>>> crew = crew + 2

>>> crew
```

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Variables - *A closer look*

```
>>> crew = 10

>>> crew + 2
12

>>> crew
10

>>> crew = crew + 2

>>> crew
12
```

Arithmetic Operators

+	addition
-	subtraction
*	multiplication
/	division
%	modulo (remainder)

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Quick Questions [5 minutes]

1. Make a variable “y” with value 10.
   Then, subtract 3 from it. **Ans: y should be 7.**
2. Make a variable “z” with value 10.
   Then, multiply it by 3. **Ans: z should be 30.**
3. Make a variable “a” with value 10.
   Then, divide it by 2. **Ans: “a” should be 5.**

Let's Code the Game #1

Use the variable **enemy_crew** to represent how many potatoes the enemy ship has. Write it out in a Python script.

Let's Code the Game #1

Use the variable **enemy_crew** to represent how many potatoes the enemy ship has.

Answer:

```
enemy_crew = 10
```

Let's Code the Game #2

Code out the Roast & Mash attacks on **enemy_crew** using the arithmetic operators. Write it out in a Python script.

potato pirates

your ship ***enemy ship***

potato pirates

Let's Code the Game #2

Code out the Roast & Mash attacks on **enemy_crew** using the arithmetic operators.

your ship ***enemy ship***

Answer:

```
enemy_crew = enemy_crew - 1
enemy_crew = enemy_crew - 2
```

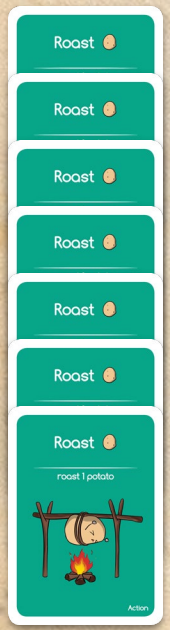
VARIABLES CLEARED!

potato
pirates

Chapter **2**

For Loops

Why For loops will save your life



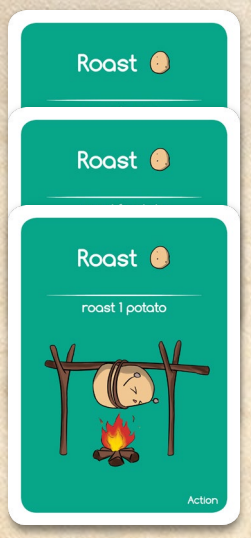

```
enemy = 10
enemy = enemy - 1
enemy = enemy - 1
enemy = enemy - 1
enemy = enemy - 1
```

Copy & Paste 1000 times?!

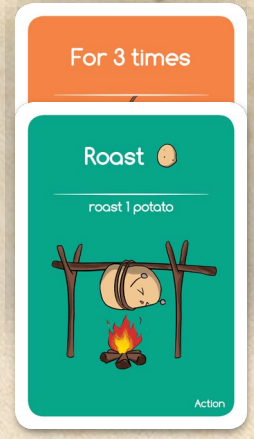
x1000

x1000

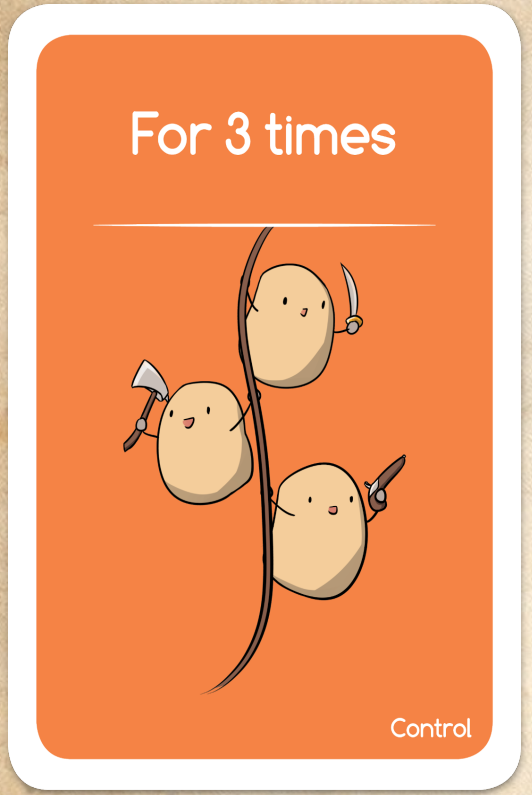
Why For loops will save your life



same as



For loops and range



How do we write for loops in Python?

For loops and range - a *quick example*

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Python code

```
for i in range(1, 4, 1):
    print (i)
```

Don’t worry, we’ll explain what everything means.

For loops and range - what is *range?*

Python code

```
for i in range(1, 4, 1):
    print (i)
```

range creates a list of numbers according to the numbers inside the brackets.

For loops and range - *input of range*

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Start:
The first number in the list

Stop:
Stop right before you reach this number

Step:
The step size between the numbers in the list

```
for i in range(1, 4, 1):
    print (i)
```

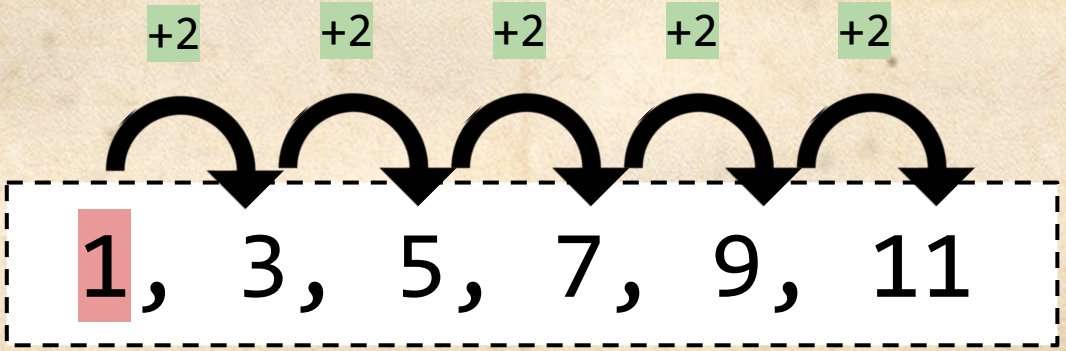
This **range** will produce a list of number 1, 2, 3.

Try writing it in IDLE.

For loops and range - *a closer look*

Let’s take a closer look at the mechanics of this range

```
range(1, 13, 2)
```



The list stops before the number **13** is reached.

For loops and range - *quick exercise*

Python code	Output
`for i in range(1, 4, 1):` `  print (i)`	`1,2,3`
`for i in range(2, 4, 1):` `  print (i)`	`?`
`for i in range(2, 6, 1):` `  print (i)`	`?`
`for i in range(2, 6, 2):` `  print (i)`	`?`

Try not to use any computer

For loops and range - *quick exercise*

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Python code	Answers
`for i in range(1, 4, 1):` `  print (i)`	1,2,3
`for i in range(2, 4, 1):` `  print (i)`	2,3
`for i in range(2, 6, 1):` `  print (i)`	2,3,4,5
`for i in range(2, 6, 2):` `  print (i)`	2,4

For loops and range - *Dummy variable*

```
for i in range(1,4,1):
        print (i)
```

What's 'i'?

This is called a dummy variable. Simply speaking, it's a temporary variable that is used to carry the value of the range at each iteration.

For loops and range - *Dummy variable*

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Python code

```
for i in range(1, 4, 1):
        print (i)
```

→ 1,2,3

is the same as

```
for potato in range(1, 4, 1):
        print (potato)
```

→ 1,2,3

is the same as

```
for ship in range(1, 4, 1):
        print (ship)
```

→ 1,2,3

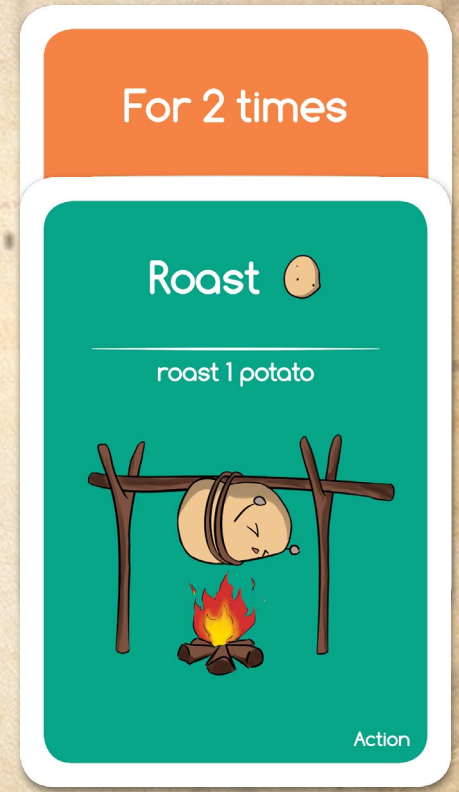
Answers

Just like any other variables, you can give any name for dummy variable

Coding the Game #3

What number should we insert as the step?

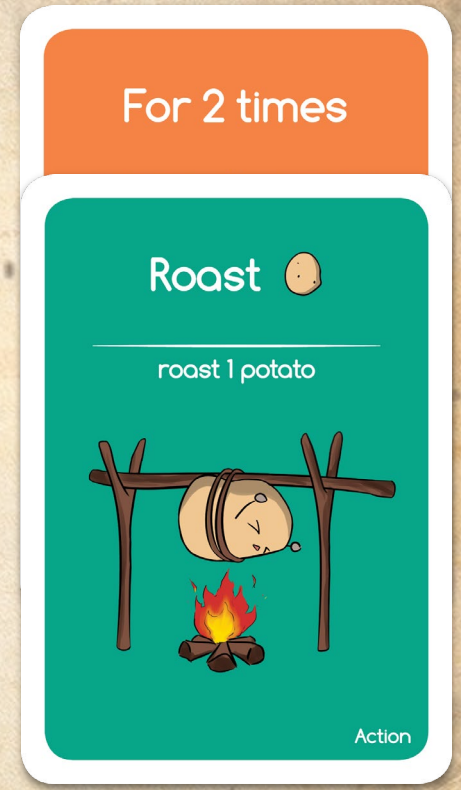
```
for i in range(0, 10, _):
    enemy_crew = enemy_crew -    1
```



Coding the Game #3

What number should we insert as the step?

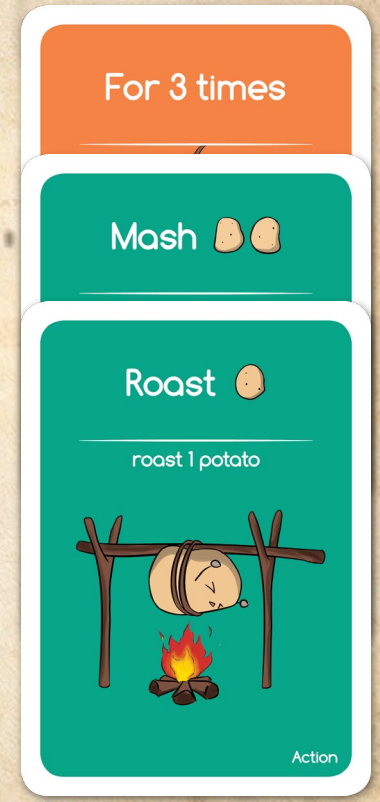
```
for i in range(0, 10, _):
    enemy_crew = enemy_crew -    1
```



Answer: 5, 6, 7, 8, or 9

Coding the Game #4

Can you code out this attack?
Assume enemy has 10 potato crew

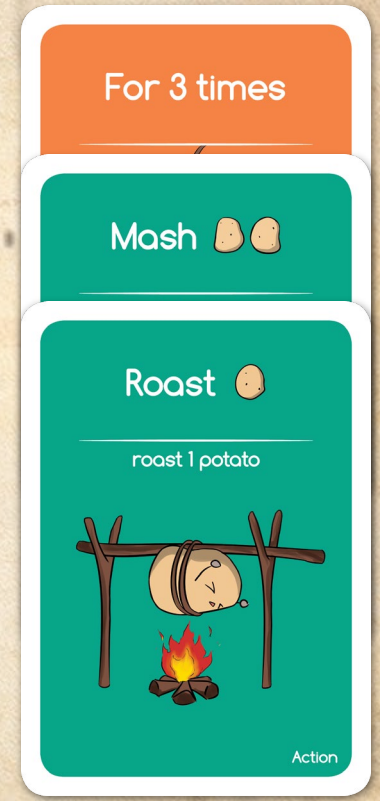


Coding the Game #4

Can you code out this attack?

```
enemy_crew = 10
for i in range(3):
    enemy_crew = enemy_crew -   2
    enemy_crew = enemy_crew -   1
```

Note: `range(3)` is a shorthand of `range(0,3,1)`



For loops and range - *default values*

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Some shortcuts for you...

If you input 2 numbers, `range(3,20)` means `range(3,20,1)`

If you input 1 number, `range(15)` means `range(0,15,1)`

The underlined numbers are default values

For Loop Challenge

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Challenge 1

```
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
```

Challenge 2

```
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

Challenge 3

```
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
```

Challenge 4

```
14
13
12
11
10
9
8
7
6
5
4
3
2
1
```

Challenge 5

```
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
```

FOR LOOPS CLEARED!

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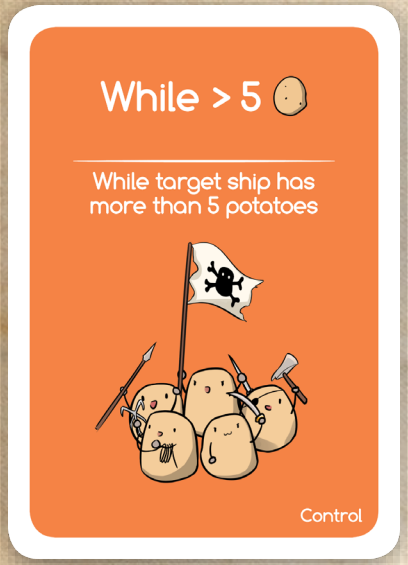
There are many more concepts!



While loops

Conditionals

Functions

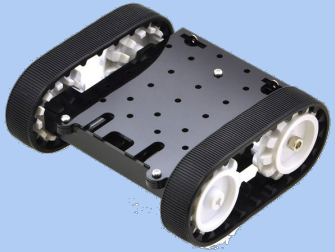
What can I do next?

Web Development

Data analytics

Game Development

Machine Learning



Robotics

Automate Tasks