An Introduction to Python

6th Class Maths

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Abstract

We introduce the students to Python. The function and importance of computer programming is discussed. We provide a tutorial on how to download Python and the Jupyter notebook. Students will learn how to perform simple arithmitic tasks on python. We introduce the concept of strings. Students will be encouraged to examine text and the properties of different strings. The print function will be introduced and by the end of the project student will create a histogram that depicts letter frequency in a paragraph from a Harry Potter novel. We recommend that this lesson is conducted in a computer lab or similar environment.

1 Learning Intentions

Upon successful completion of this lesson, students will be able to;

- Create strings

- Print strings

- Solve basic arithmetic problems on python

- Recognize how indexing works on python

- Analyze letter frequency in a sentence

- Capitalize letters and revert back to lowercase text

- Create a simple histogram

2 Lesson Rationale

2.1 Prior Knowledge

For most students this will be the first introduction to Python. Ideally we hope that students have previous experience with Scratch. Students should recognize that we can use a computer to solve problems and create games.

2.2 Resources Required

- Access to a computer

- Python

- Jupyter Notebook

- Workbook exercises

2.3 How will learning be assessed?

- Geoboard Questions on PowerPoint

- Juypter Exercise Sheet

- Listening to student approaches and conversations

2.4   Common Student Misconceptions

- Forgetting to put strings inside quotations

```
I like pop music
```
```
  File "<ipython-input-52-b1c0554654f6>", line 1
    I like pop music
         ^
SyntaxError: invalid syntax
```

```
"I like pop music"
```
```
'I like pop music'
```

- Forgetting to use brackets and parenthesis when working with functions such as print and len

```
print(I am very hungry!)
```
```
  File "<ipython-input-49-aad058496f0b>", line 1
    print(I am very hungry!)
                    ^
SyntaxError: invalid syntax
```

```
print"I am very hungry!"
```
```
  File "<ipython-input-48-67ee37d40527>", line 1
    print"I am very hungry!"
                          ^
SyntaxError: invalid syntax
```
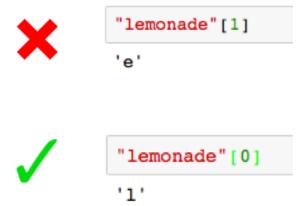
```
print("I am very hungry!")
```
```
I am very hungry!
```

- Trouble understanding that computers begin counting at 0 instead of 1. For example when trying to find the first letter of the word 'lemonade'.


```
"lemonade"[1]

'e'
```



```
"lemonade"[0]

'l'
```

- Identifying that blank spaces count as characters in a string

- Realising that Python recognises 'h' and 'H' as different characters.

```
In [1]:  "You're a wizard Harry".count('h')
Out[1]:  0

In [2]:  "You're a wizard Harry".count('H')
Out[2]:  1
```

3 Lesson Flow

- Introduction to Python. What is a computer language and why do we need computers in maths, science and everyday life

- Video One - Introduction to Python and the Juypter notebook

- Exercises from video one

- Video Two - Introduction to Strings

- Exercises from video two

- Video Three - More advanced topics on strings

- Exercises on video three

- Recap and refelction