Python in a Jupyter Notebook

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Python Programming Language in Jupyter Notebook

In this project, I aim to answer my start-up question about the Phyton programming language: Why is Python so popular? Why use Python? How does language process it, or are there any libraries in it? Additionally, McKinney(n.d.) asked a good question Why Python for Data Analysis? Python programming language has become one of the most popular and easy-to-learn Python code and execute much faster than other programming languages use programming languages because it has clear syntax and is not complicated, which is more special important in natural language with Perl, Ruby, and others since 2005. An excellent reason for the popularity of Python has simple syntax so that it can be easily read and understood, and other reasons might also quickly scientific procedure undertaken to make a discovery, test a hypothesis, or demonstrate a known fact by changing the code base of python as it is an *interpreted language*. Python has improved a large and active scientific computing and data analysis community between the years 2018 and 2021 close to 3M new developers entering and a total number of 27M in the next two years, almost 30M that Python eliminates "at your own risk" to one of the most critical languages for data science, machine learning, and general software development in academia and industry. Phyton has developed libraries like pandas and sci-kit-learn, the most popular tools for data analysis tasks and excellent selection as a primary language for building data applications. And other open sources and commercial programming languages and tools like R, MATLAB, SAS, Stata, etc. "Python is an ideal language for rapidly whipping your data into shape."(Nelson, 2018)

Let's dive deep into Python in Jupyter.

Python building data structure and libraries that help to select and save time and effort on the initial development cycle from the perspective of data manipulation NumPy, pandas, matplotlib, IPython and Jupyter, SciPy, sci-kit-learn, and stats models.

Installation and Setup

Figure 1: Create a new Jupyter notebook named MIS542.

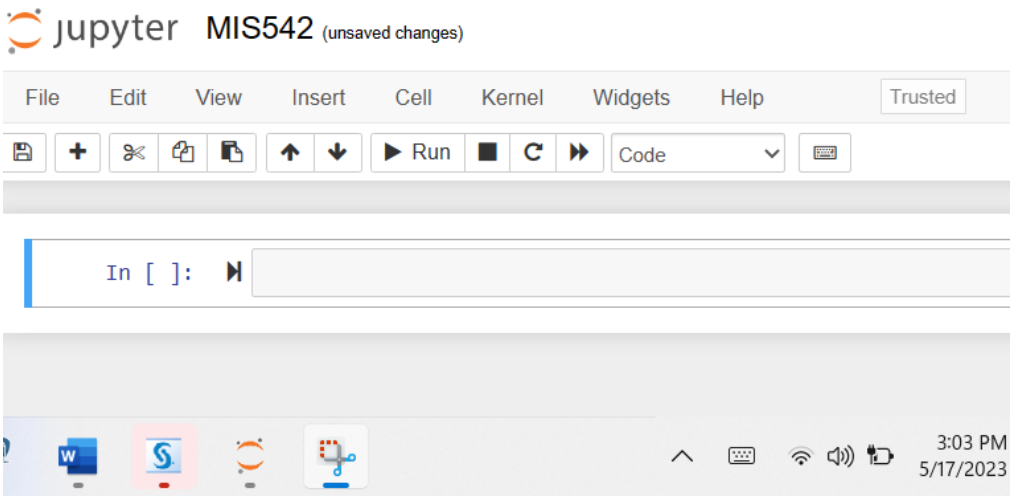
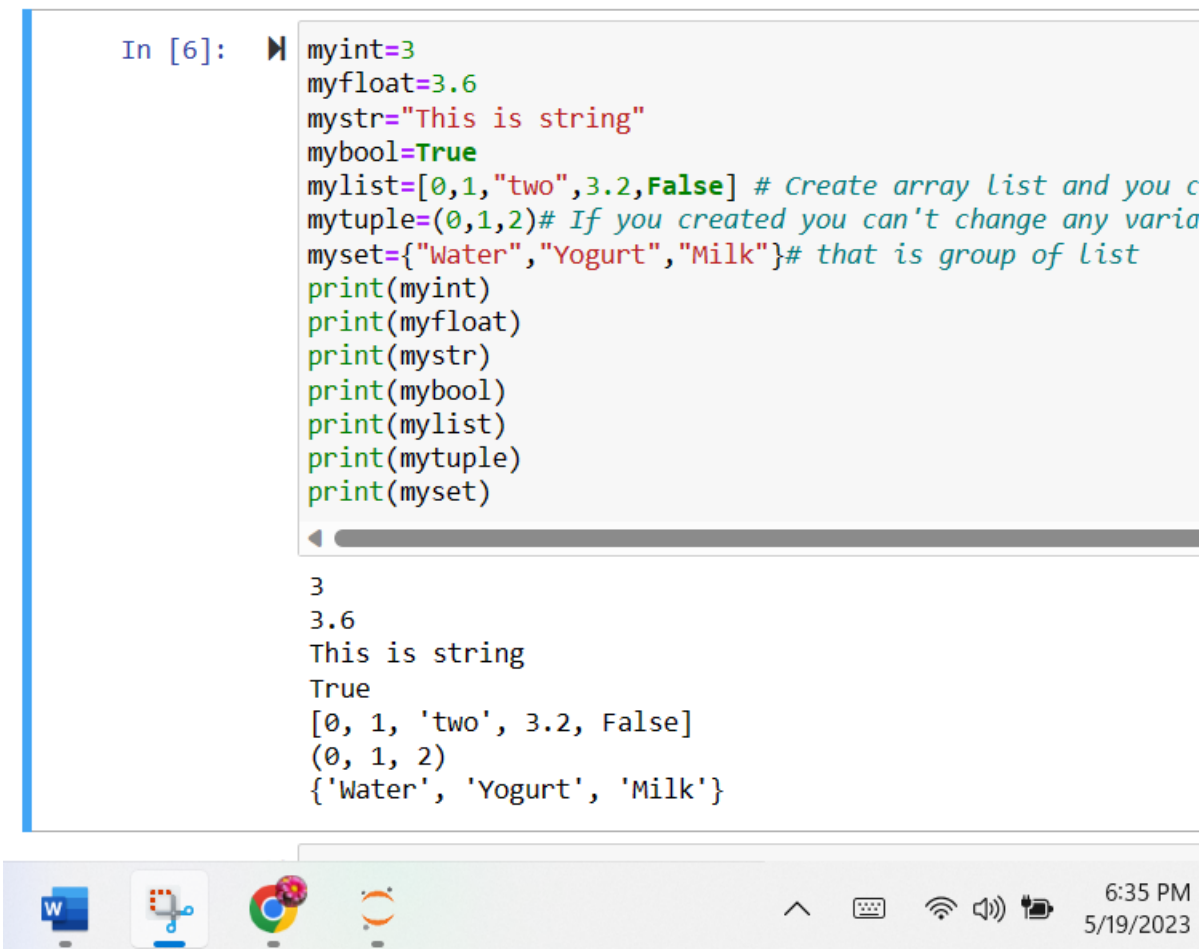


Figure 2: Result of variable



Data Types

Python mainly uses four data types: the **string** containing Unicode characters such as letters, numbers, and symbols. **Numerical** store numerical values like integers, floating-point numbers, and complex numbers. Boolean binds data to True/False or yes/no options. **The sequence** helps to store order collections of similar or different data types, such as lists, strings, and tuples.

Figure 3: Result of different data types

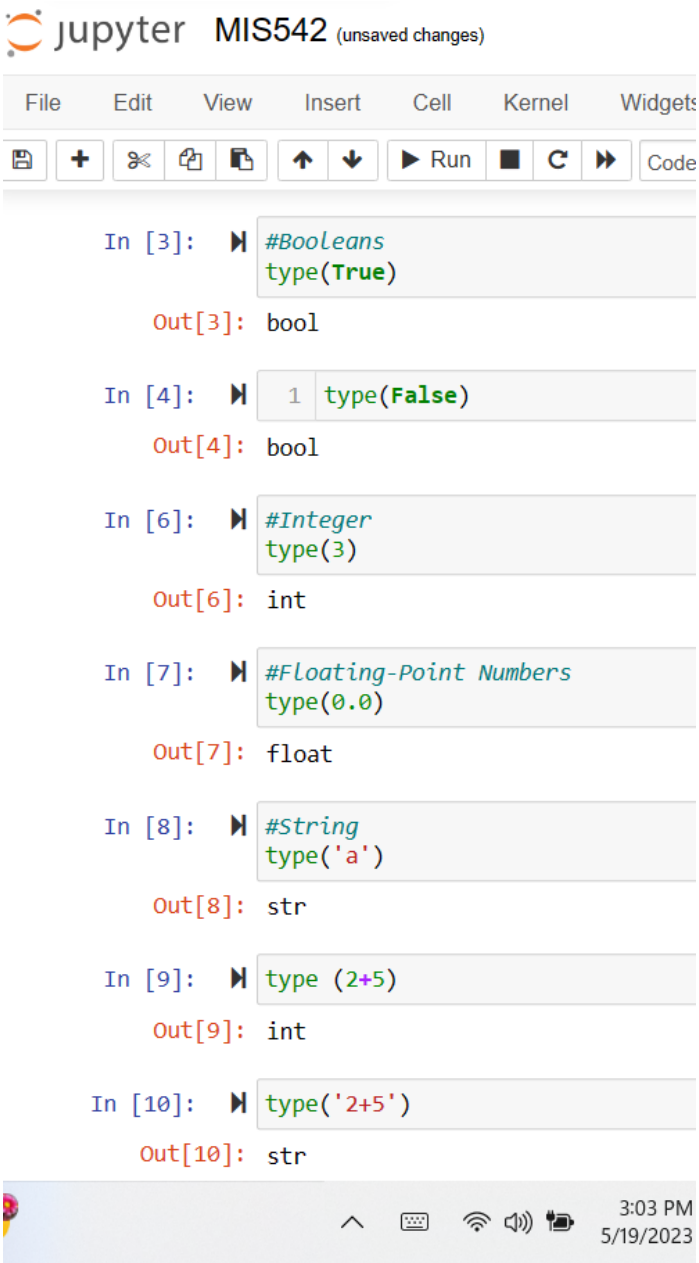
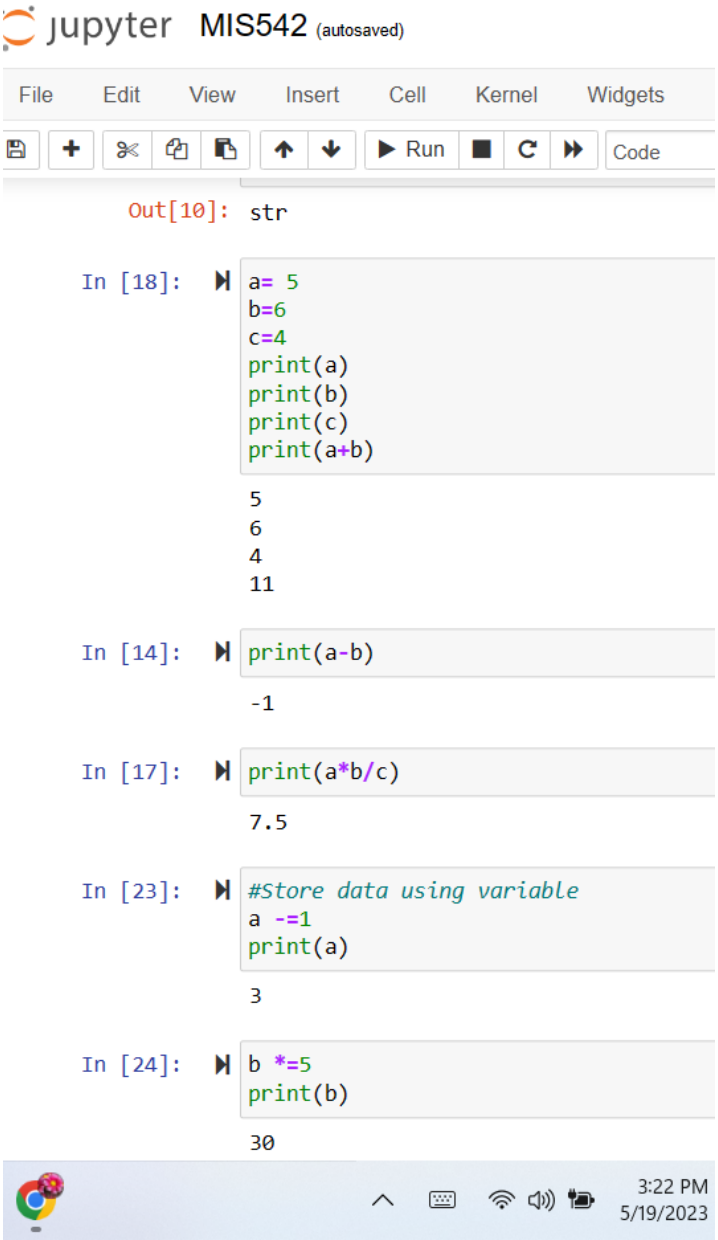


Figure 4: Result of the equation by variable

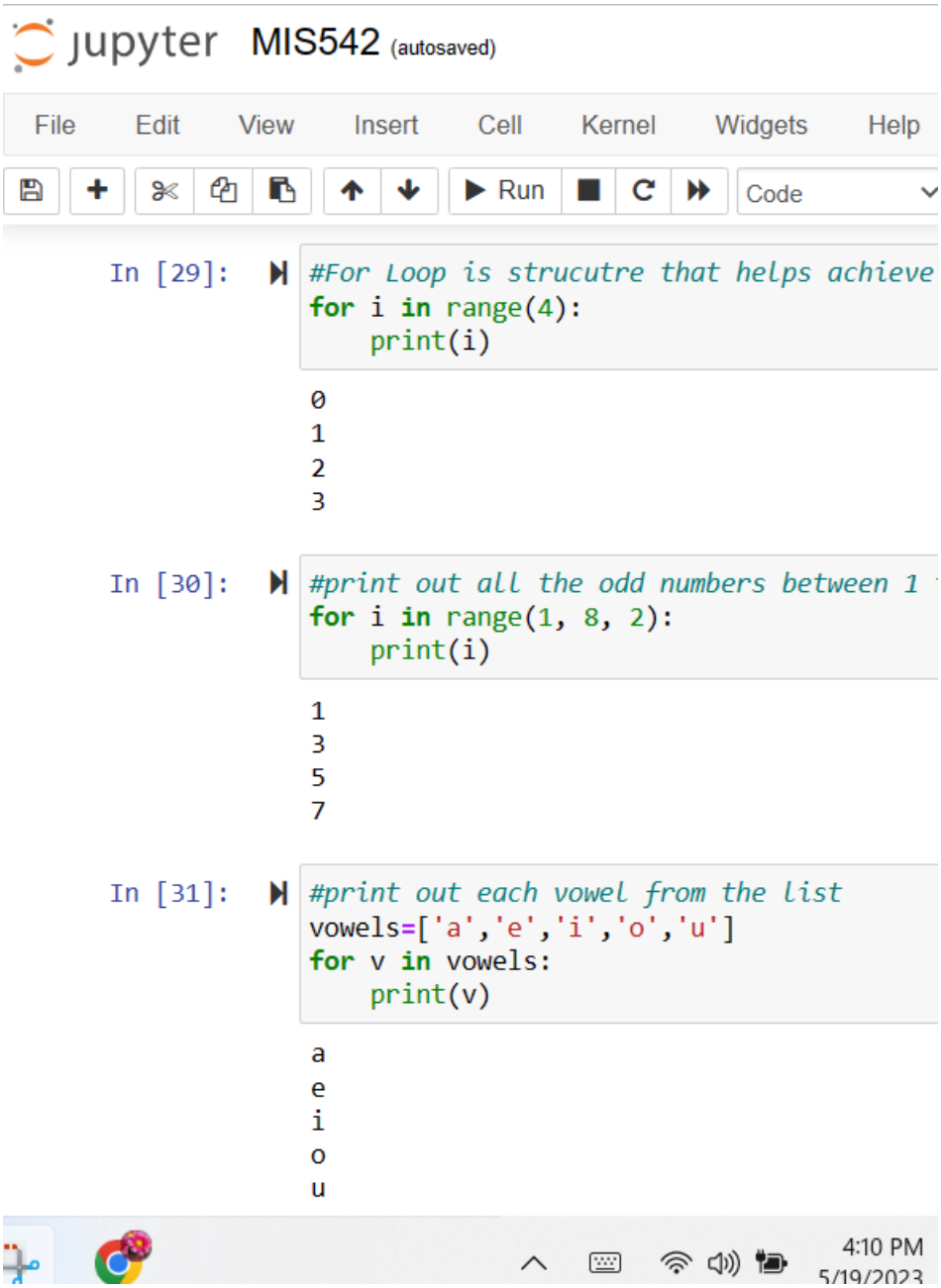


For Loop

For Loop is a structure that helps achieve iteration. There are a few different ways to use for loop; the **range()** function can specify a range of numbers and range() builds a process that takes in the following inputs as the **range(start, stop, step)** that the start and step size are optional such as when a starting

number is not provided, and range default to starting with zero or a step size is not provided range defaults to using a step size of one. The ending number must be provided.

Figure 5: Result of For Loop.



If Statement

A conditional statement instructs the computer to perform specific actions if certain conditions are satisfied, that most straightforward conditional statement. For example, ask the user for an integer between -10 and 10, and if the number they enter is less than five, a message is displayed to the user.

Figure 6: Result of If Statement.

```
In [2]:
# variable name n i string
#input function input always returns the user's response the prompt
# n cannot compare each other so is string as string just compare to string
#number compare to number how to compare n to five?
#int function can help that can be converted into an integer
n = input("Choose an integer between -10 and 10 enter it here: ")
n = int(n)
if n < 5:
    print("The integer you chose is less than 5.")

Choose an integer between -10 and 10 enter it here: 4
The integer you chose is less than 5.
```

```
In [3]:
a= 2
if a<5:
    print('less than five')

less than five
```

If-Else Statement

If-else statement instructs the computer to perform a specific action if a particular condition is met and a different action if that condition is not. For example, a function takes two numbers as inputs, which can be either integers or floating point numbers, and the function returns the minimum of these two numbers.

Figure 6: Result of IF-ELSE statement

jupyter MIS542 (autosaved)

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Run Code

In [32]:
```
#start def funtion is defining a function
#followed by the name of function minimum
# x and y will be generic representation of the input
# than start if key word
#followed by the condition that I want to check
# if the first contition work than return first
#if not else key word than second return
def minimum(x,y):
    if x<y:
        return x
    else:
        return y
```

In [33]:
```
# test out minimum on the inputs 2 and 5
result =minimum(2,5)
print(result)
```

```
2
```

In [34]:
```
# test out minimum on the inputs -2 and -5
result = minimum(-2,-5)
print(result)
```

```
-5
```

In [35]:
```
#test out minimum the inputs 3 and 3.1
result=minimum(3,3.1)
print(result)
```

```
3
```

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If-ELIF Statement

If-Elif statement performs a specific action if a particular condition is satisfied or a different action or state is met, like a user if it's raining and if they have an umbrella and the user's responses a message displayed to the user.

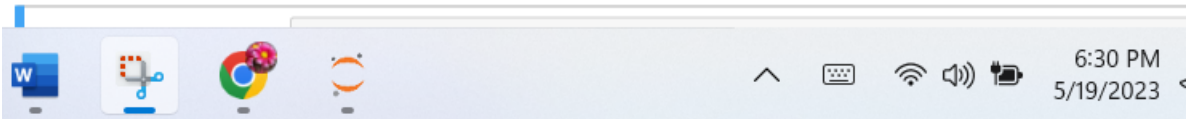
Figure 7: Results of If-Elif statement.

```
In [4]:  raining = input("Is it raining? (yes/no)")
         umbrella = input("Do you have an umbrella? (yes/no)")
         if raining =="yes" and umbrella == "yes":
             print("Don't forget your umbrella when you go out!")
         elif raining == "yes" and umbrella == "no":
             print("Wear a waterproof jacket when you go out!")

         Is it raining? (yes/no)yes
         Do you have an umbrella? (yes/no)yes
         Don't forget your umbrella when you go out!

In [5]:  x = input("Enter a number here: ")
         x = float(x)
         if x < 2:
             print("The number is less than 2.")
         elif x < 6:
             print("The number is less than 6.")
         elif x < 8:
             print("The number is less than 8.")
         elif x < 10:
             print("The number is less than 10.")

         Enter a number here: 1
         The number is less than 2.
```



References

McKinney, W. (n.d.). *Python for Data Analysis*. Data Wrangling with Pandas, NumPy, and IPython. 2nd edition. Retrieved from https://platform.virdocs.com/r/s/0/doc/591193/sp/176706392/mi/566184474

Vijayan, L. & Madecraft, 2019. *Python Quick Start*. https://www.linkedin.com/learning/python-quick-start/if-elif-and-if-elif-else-statements?

Pawandeep.(n.d.), 2021. *How to declare a variable in Python?* https://www.tutorialspoint.com/how-to-declare-a-variable-in-python