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DATA, INFERENCE, AND APPLIED MACHINE LEARNING

18-785

ASSIGNMENT 0

3 SEPTEMBER 2022

I, the undersigned, have read the entire contents of the syllabus for course 18-785 (Data Inference and Applied Machine Learning) and agree with the terms and conditions of participating in this course, including adherence to CMU's AIV policy.

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The libraries used:

- import numpy as np
- import pandas as pd
- import matplotlib.pyplot as plt

The first task of displaying the string “Hello Data Inference and Machine Learning” is done by using the print function from Python.

The three mathematical constants are described below in the following picture:

1. **Pi:** frequently denoted by π, it is a mathematical constant that is approximately equal to **3.141592653589793.** In python, **Pi** is available in math library and in NumPy library as well.

2. **e:** Euler's constant (e), is a mathematical constant that is approximately equal to **2.718281828459045** and it is frequently used as the base of natural logarithms or Neperian’s logarithms. In python, **e** is available in math library and in NumPy library as well.

3. **Phi:** Two numbers are said to be in the golden ratio if their ratio is the same as the ratio of their sum to the larger of the two quantities. **Phi** is approximately equal to **1.618033988749895.** The formula for **phi** is **((a +b) / a) = a/b = phi** where **a>b>0.**

The last step was to sum up the three constants and then displaying them.

In [31]:
```
import math              # Importing the math library
import numpy as np       # Importing the numpy library
```

In [32]:
```
print("Hello Data Inference and Applied Machine Learning")       # Printing the string
```

```
Hello Data Inference and Applied Machine Learning
```

In [33]:
```
Pi = 3.141592653589793   # Denoted by π, it is a mathematical constant
print(Pi)                # Printing the value of Pi
print(np.pi)             # Printing Pi available in numpy library
print(math.pi)           # Printing Pi available in math library
```

```
3.141592653589793
3.141592653589793
3.141592653589793
```

In [34]:
```
e = 2.718281828459045    # Euler's constant (e), a mathematical constant, the base of the natural logarithms.
print(e)                 # Printing the value of e
print(np.exp(1))         # Printing value of e through numpy library
print(math.e)            # Printing value of e through math library
```

```
2.718281828459045
2.718281828459045
2.718281828459045
```

In [35]:
```
# Two numbers are in the golden ratio if their ratio is the same as the ratio of their sum to the larger of the two quantities.
phi = 1.618033988749895 # Formula: ((a +b) / a) = a/b = phi  i.e. a>b>0
phi1 = ( 1 + math.sqrt(5) ) / 2   # calculating the value of phi

print(phi)              # Printing the phi's value
print(phi1)             # Printing the phi's value
```

```
1.618033988749895
1.618033988749895
```

In [36]:
```
# Printing the sum of three constants
sum3 = Pi + e + phi                                 # Summing up the constants
print("The sum of the three constants is:", sum3)       # Printing the sum of the constants
```

```
The sum of the three constants is: 7.477908470798733
```

Figure 1: Describing Pi, e, and Phi