CMS Office Hours
Project 1: Create an Integration Code **2020-Aug-10**

Use Python to develop a script which integrates a User-defined 1-dimensional function ($f(x)$) over User-specified integration bounds.

Example:

```
user_defined_function = 2 * sin(x)
your_integrator(user_defined_function, 0, pi)
# returns: 4.0
```

Here is a general template to structure your code (or use your own):

```
"""
This code returns the value of integration when the User
specifies a function and the integration bounds.

Example:
    user_defined_function = 2 * sin(x)
    your_integrator(user_defined_function, 0, np.pi)  # (fn, x_min, x_max)
    # returns: 4.0
"""
import numpy as np

#--- User-defined/Global variables.
x_min = 0.0
x_max = 2.0
def fn(x):
    return 2 * np.sin(x)

#--- Script functions.
def integrate(fn, x_min, x_max):
    """Take in a function (fn), x_min, x_max and return the value of integration."""
    # Your code goes here.

def calc_area_of_rect(width, height):
    """Calculate the area of a rectangle."""
    return width * height

#--- You will probably need more functions than just the two above.

if __name__ == "__main__":
    # When you do: 'python this_script.py', then this code will be executed.
    integrate(fn, x_min, x_max)
```