

1. Finish in class labs

- a) Ensure each integration method is functioning
- b) Construct a plot showing the accuracy of each method versus -
  - the number of sections/romberg steps in the integration
  - the compute time

2. Download GAIA.csv and Vega\_SED.csv

Calculate the area for both curves with each method.

- a) Each integration method (Trapezoidal, Simpson's, and Romberg) must return a valid numerical result. If any method fails, explain why and suggest a fix.
- b) Comment on the steps needed to compute the area of the data from Vega\_SED.csv

3. Create the python code which computes the following mathematical expressions

$$s = \sum_{i=1}^n f(x_i)$$

a)

Where:  $f(x) = x^2$

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i$$

b)

Where

$$x_i \in S,$$

$$S = \{x_1, x_2, \dots, x_n\}$$

(i.e.  $x_i$  can be from whatever group of numbers you want)

c)

$$n! = n \times (n - 1) \times (n - 2) \times (n - 3) \dots 1$$

4) Book exercise 5.20