Turn in the 5 questions as a single .py file onto canvas. Use comments to clearly indicate which question you are working on. Your filename should end as _py2.py if you use Python2 and _py3.py if you use Python3.

1. Consider Beale's function defined as

$$f(\mathbf{x}) = (1.5 - x_1(1 - x_2))^2 + (2.25 - x_1(1 - x_2^2))^2 + (2.625 - x_1(1 - x_2^3))^2$$

on the domain $0 \leq x_1 \leq 4.0$ and $-0.5 \leq x_2 \leq 1.0$. Evaluate Beale's function on a grid by using np.meshgrid() on the domain.

2. Based on the previous meshgrid. Generate a filled contour plot. Use a different color map than the default! Include the colorbar. Label your axes.

3. Generate a 3D scatter plot of Beale's function at the data points you've used for the meshgrid. Make sure all data points are the same color. Label your axes.

4. Create a 3D surface plot of Beale's function. Label your axes.

5. Consider point $a = [3.5, -0.2]$ and point $b = [2.0, 0.9]$. Plot Beale's function between point a and point b.