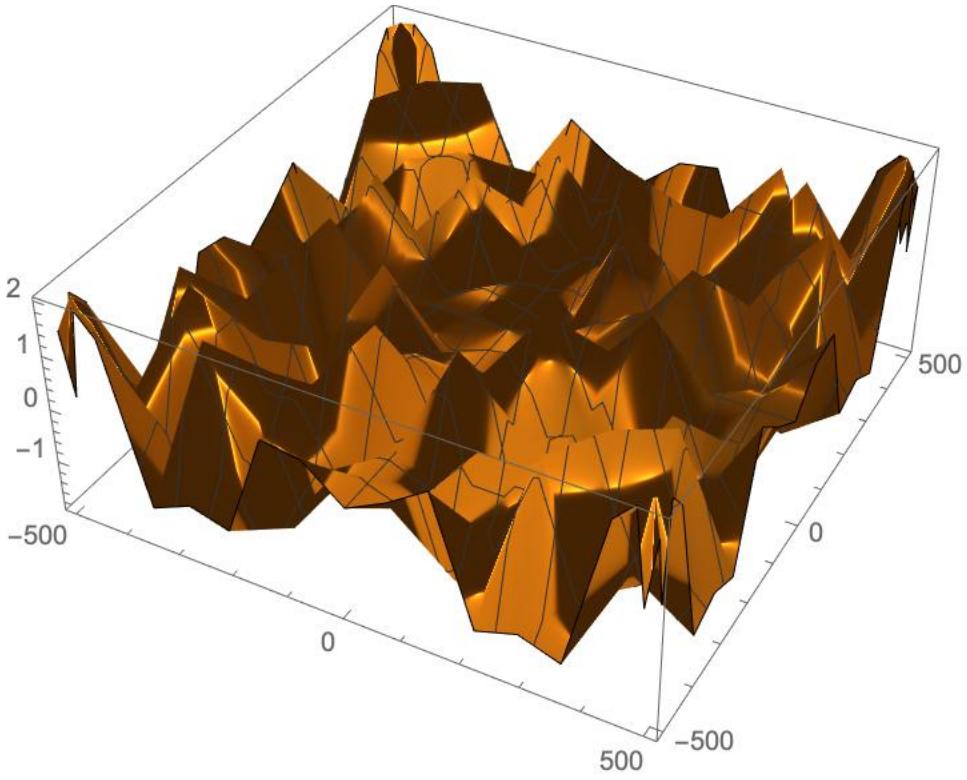
# Homework Week 6:

(1) The code below defines is an egg-holder function gun. Use your favorite methods and several starting points in order to find at least two different relative minima. Sample code on the website should help.




```
def g(x):
    return np.sin(np.sqrt(np.absolute(x/2+47)))-np.sin(np.sqrt(np.absolute(x-47)))

def gun(x):
    return g(x[0]*x[1])
```

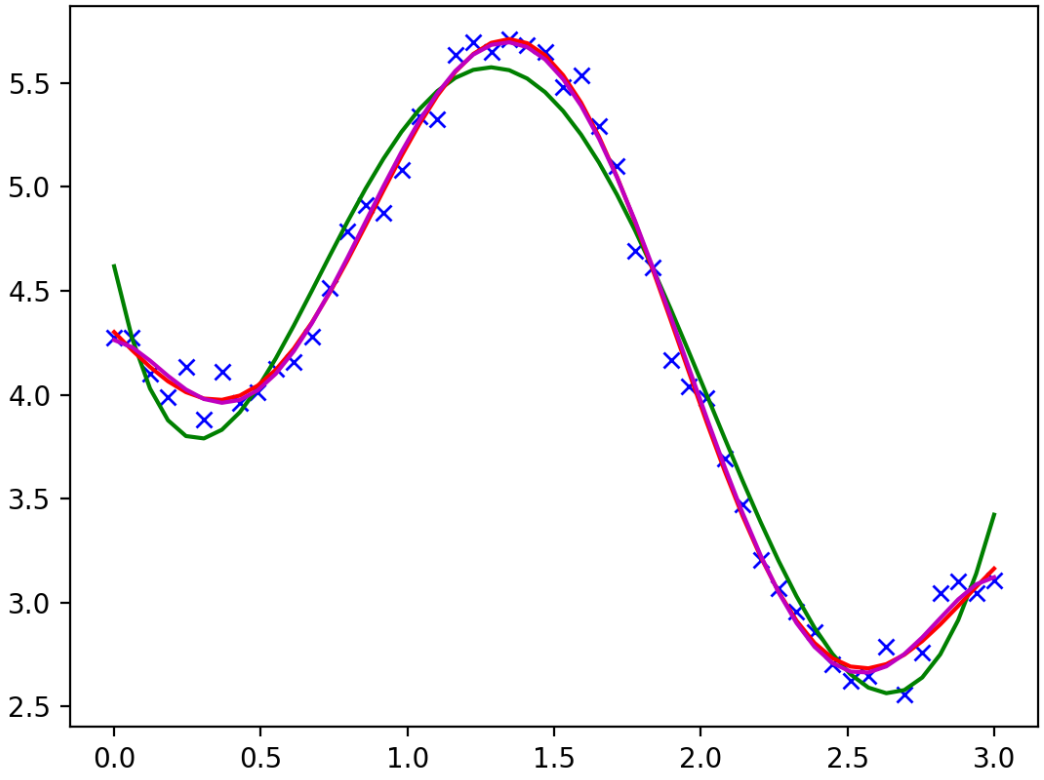
(2) Modify the code in curve.py so that the function f now has the form

$$f(t) = \alpha + \beta \cdot \cos(\gamma t + \epsilon) + \omega \cdot \sin(\phi t + \psi).$$

Use parameters $\alpha = 4, \beta = 1, \gamma = 3, \epsilon = 2, \omega = \phi = \psi = 1$ to generate 150 points on this function plus an error term generated by `0.1 * np.random.normal(size = 150)`. Then fit

1. a function of the same type as $f$
2. a polynomial of degree five
3. a polynomial of degree seven

to the points generated. Using the same code as in curve.py, show the result using myplotlib. The following sample shows the solution, though the magenta and the red graph almost overlap.



(3) The file points.csv contains the x and y coordinates of the following points, see below. Decide on a model (family of functions) and find a good fit. Try to use as few parameters as possible.