You must implement a Matlab function or a Python executable file called linear\_regression that uses linear regression to fit a polynomial function to the data. Your function should be invoked as follows:

linear\_regression(<training\_file>, <test\_file>, <degree>, <lambda>)

If you use Python, just convert the Matlab function arguments shown above to command-line arguments. The arguments provide to the function the following information:

* The first argument, <training\_file>, is the path name of the training file, where the training data is stored. The path name can specify any file stored on the local computer.
* The second argument, <test\_file>, is the path name of the test file, where the test data is stored. The path name can specify any file stored on the local computer.
* The third argument, <degree> is an integer between 1 and 10. We will not test your code with any other values. The degree specifies what function φ you should use. Suppose that you have an input vector x = (x1, x2, ..., xD)T,.
  + If the degree is 1, then φ(x) = (1, x1, x2, ..., xD)T.
  + If the degree is 2, then φ(x) = (1, x1, (x1)2, x2, (x2)2..., xD, (xD)2)T.
  + If the degree is 3, then φ(x) = (1, x1, (x1)2, (x1)3, x2, (x2)2, (x2)3, ..., xD, (xD)2, (xD)3)T.
* The fourth argument, <λ>, is a non-negative real number (it can be zero or greater than zero). This is the value of λ that you should use for regularization. If λ = 0, then no regularization is used.

The training and test files will follow the same format as the text files in the [UCI datasets](https://athitsos.utasites.cloud/courses/cse4309_fall2021/assignments/uci_datasets) directory. A description of the datasets and the file format can be found [on this link](https://athitsos.utasites.cloud/courses/cse4309_fall2021/assignments/uci_datasets/dataset_description.html). For each dataset, a training file and a test file are provided. The name of each file indicates what dataset the file belongs to, and whether the file contains training or test data. Your code should also work with ANY OTHER training and test files using the same format as the files in the [UCI datasets](https://athitsos.utasites.cloud/courses/cse4309_fall2021/assignments/uci_datasets) directory.