

Problem 1. Assume you are given a list of points as follows: $(2,2,2), (3,3,3), (4,4,4), (6,0,0), (0,6,0), (0,0,6)$.

Write two functions, *findMean* and *findStd*, in Python that return the mean and the standard deviation of these points, respectively. Generalize your functions to accept a list of different number of points.

Problem 2. Write a Python function, *InnerProduct*, to accept two lists (representing vectors) as arguments and return their inner (dot) product.

Problem 3. Social Security Administration keeps track of the names of both boys and girls born in the United States. Our goal is to find the most popular boy name and a girl name for each of these years.

You are provided with a file that contains data from 1880 to 2008 for both genders. This file has four columns: year, name, percent and gender. The percent column represents the percentage of babies born that year who had that name. The rows of the file are randomly shuffled. Write Python code to answer the following questions:

- (a) The most popular boy name for each year between 1880 and 2008.
- (b) The most popular girl name for each year between 1880 and 2008.
- (c) The most popular name across all these years for both boys and girls based on the percentage of the population that has had that name.

1 What to submit

Submit a `hwk1_<your directory id>.ipynb` file. Write comments in the file to describe each function and any specific commands. The homework is to be turned in on ELMS. Do not use any in-built Python function, such as `mean` or `std` etc., to directly answer any of these questions.