Kiana Mills

904754661

Homework 2

Second Problem

b) f and f’ are more or less orthogonal because their dot product is close to 1

c) The calculated length Af' is 0.029. It should be around 0 and also should be equal to the cosine angle between f and f’, because f and f’ are orthogonal.

Third Problem

c) Constructing truly orthogonal sets of vectors is only easy in the trivial case of taking any scalar multiple of the vectors (1,0) and (0,1)

d) (ii) The cosine angle between g and g’ is approximately 1, meaning the angle between these two vectors is approximately 0 degrees.

(iii) The length of g’ is approximately 1.

(iv) For n = 50, the average length of hᵢ’ is 0.721 and the average length of gᵢ is 1.2248.

See the generated histograms for n =1,20,..,100

e) Refer to the generated graph of Mean Dot Products for n = 1, 20, 40, 60, 80, 100.

For n = 1, the dot product is the closest to 1.

Fourth Problem

1. See the generated output.