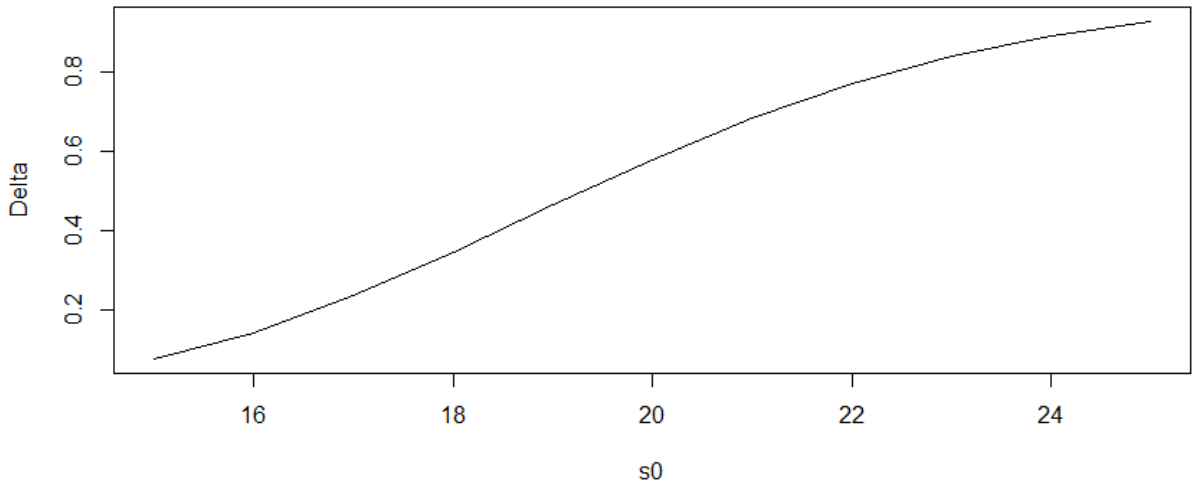
Project 3

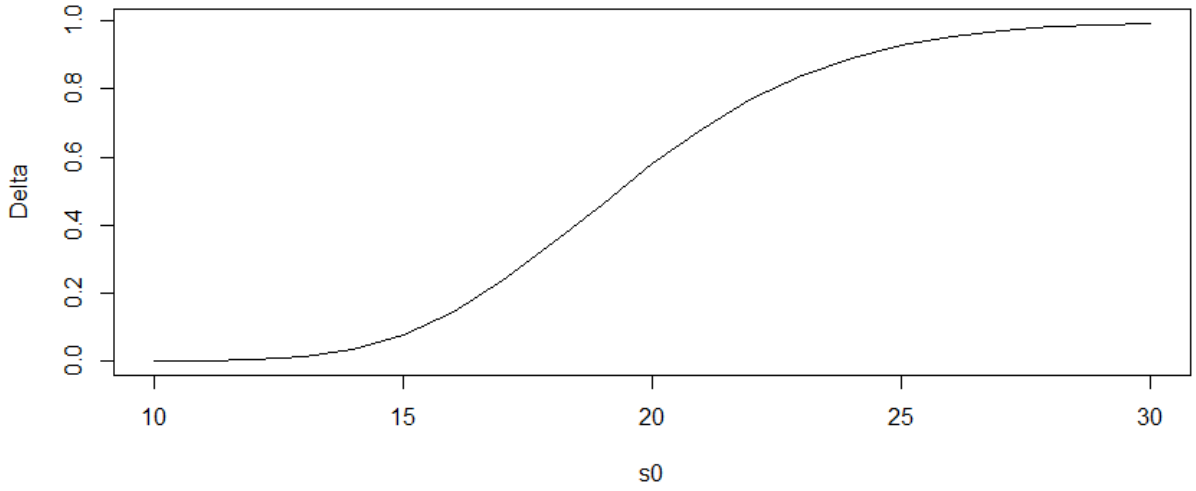
Nikhil Guruji – Cohort 1

1- Solved in R
2- Solved in R
3- Solved in R
Plots:

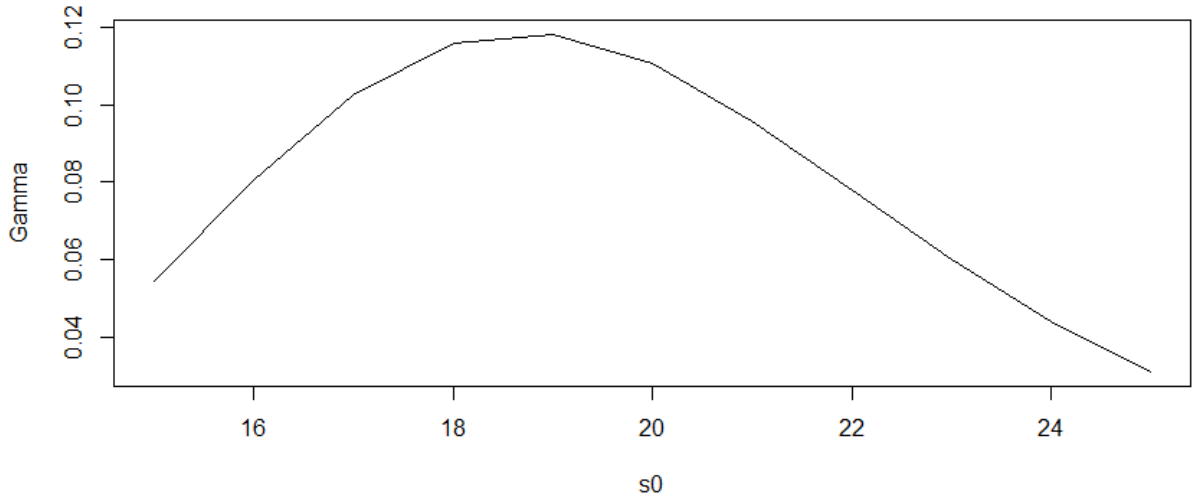
(I) Delta:



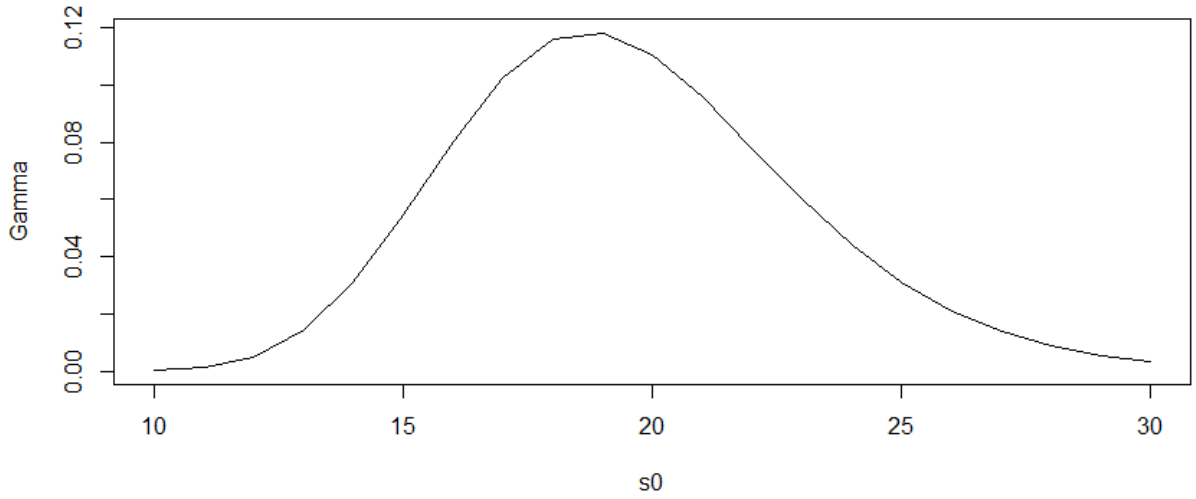
Delta (on an enlarged scale of S0: 10 to 30):



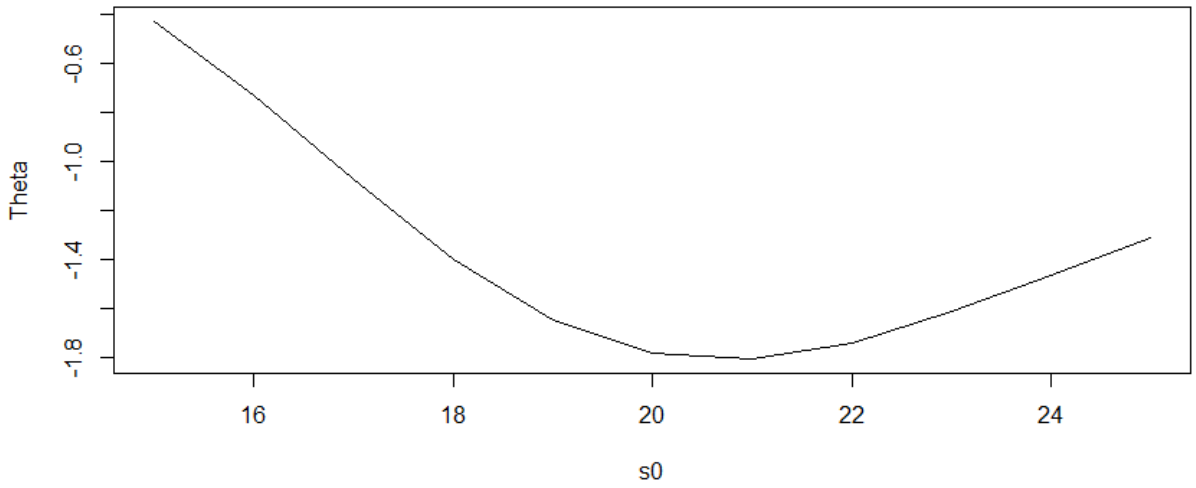
(II) Gamma:



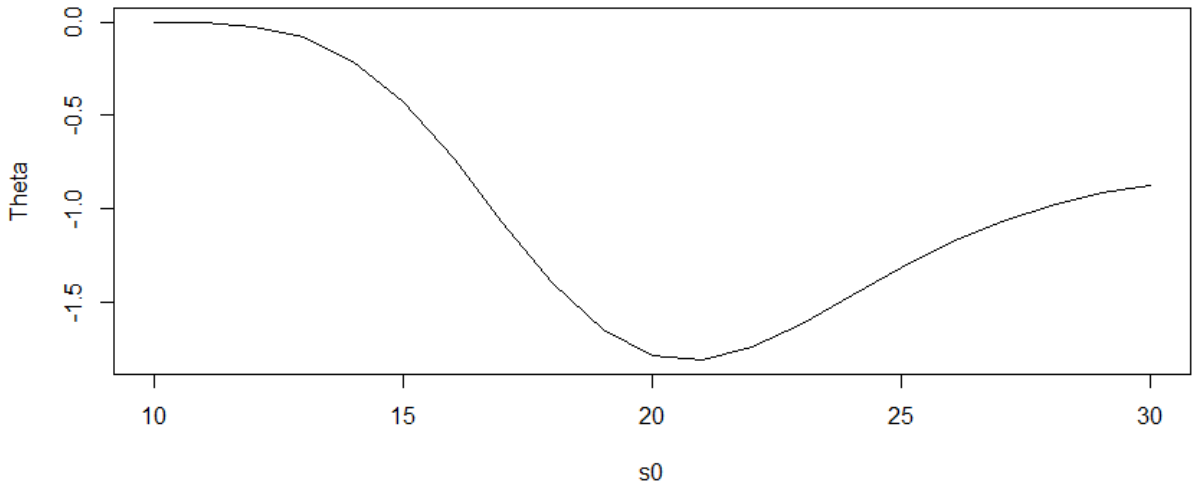
Gamma (on an enlarged scale of S0 : 10 to 30):



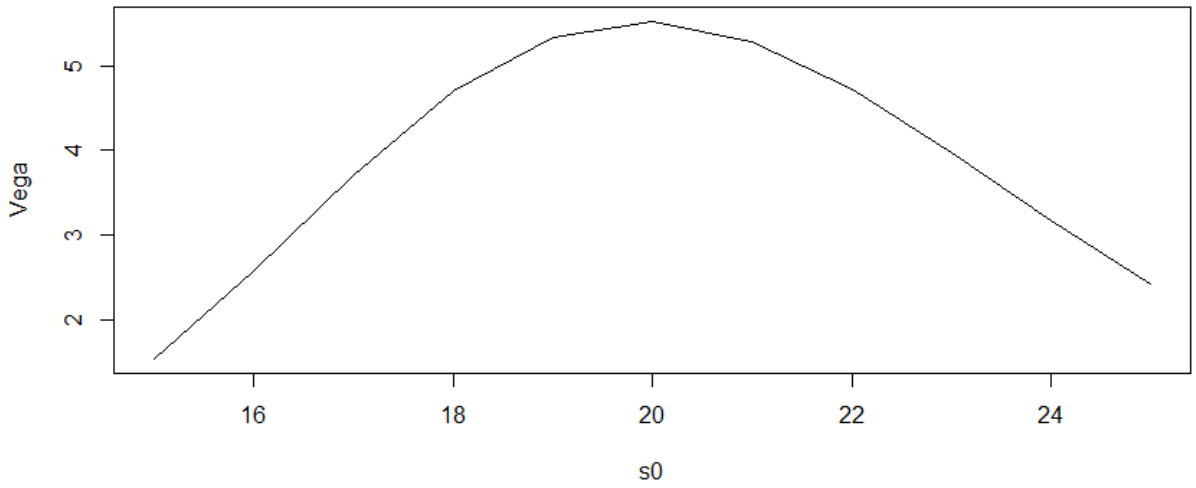
(III) Theta:



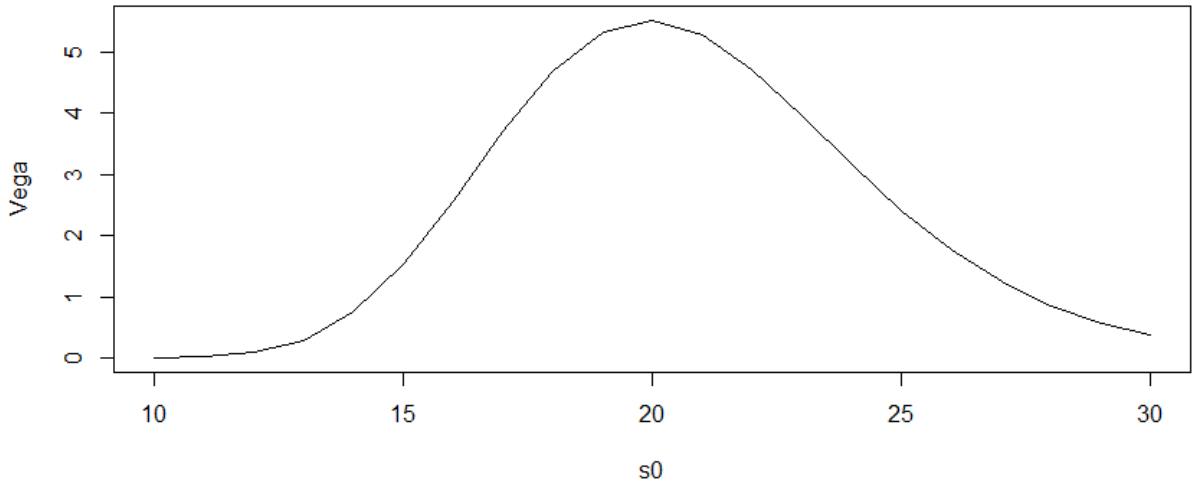
Theta (on an enlarged scale of S0: 10 to 30):



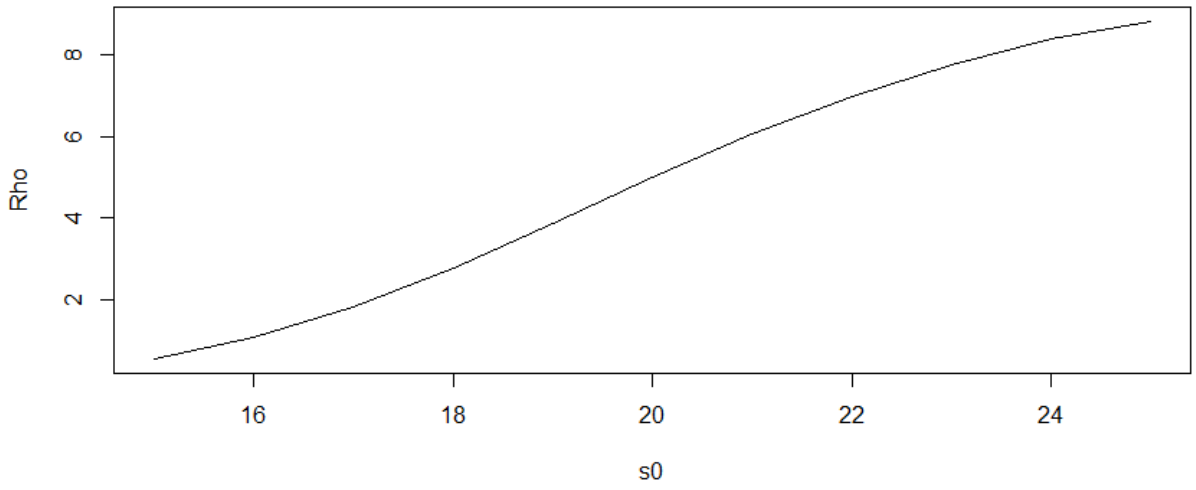
(IV) Vega



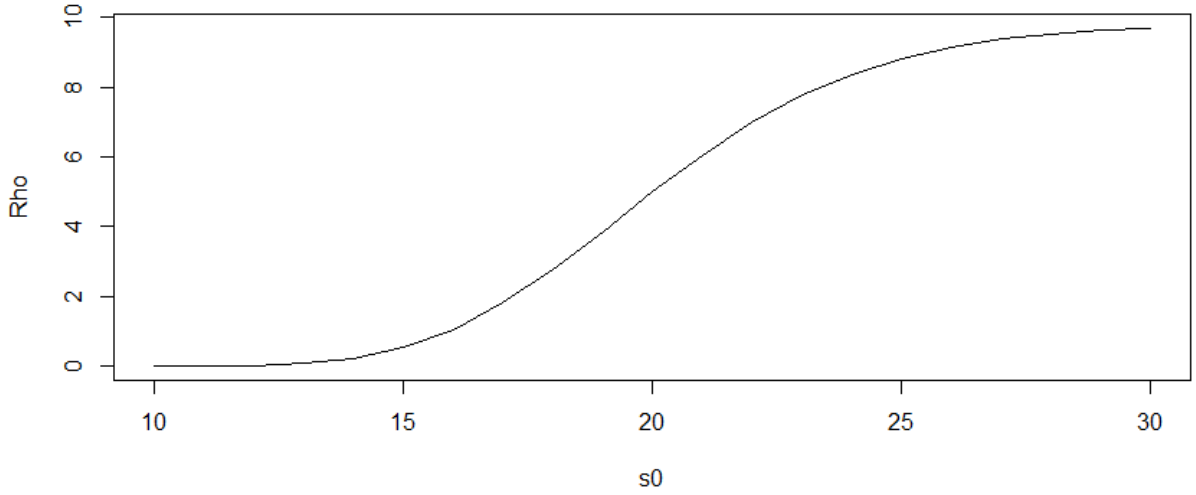
Vega (on an enlarged scale of S0: 10 to 30):



(V) Rho:



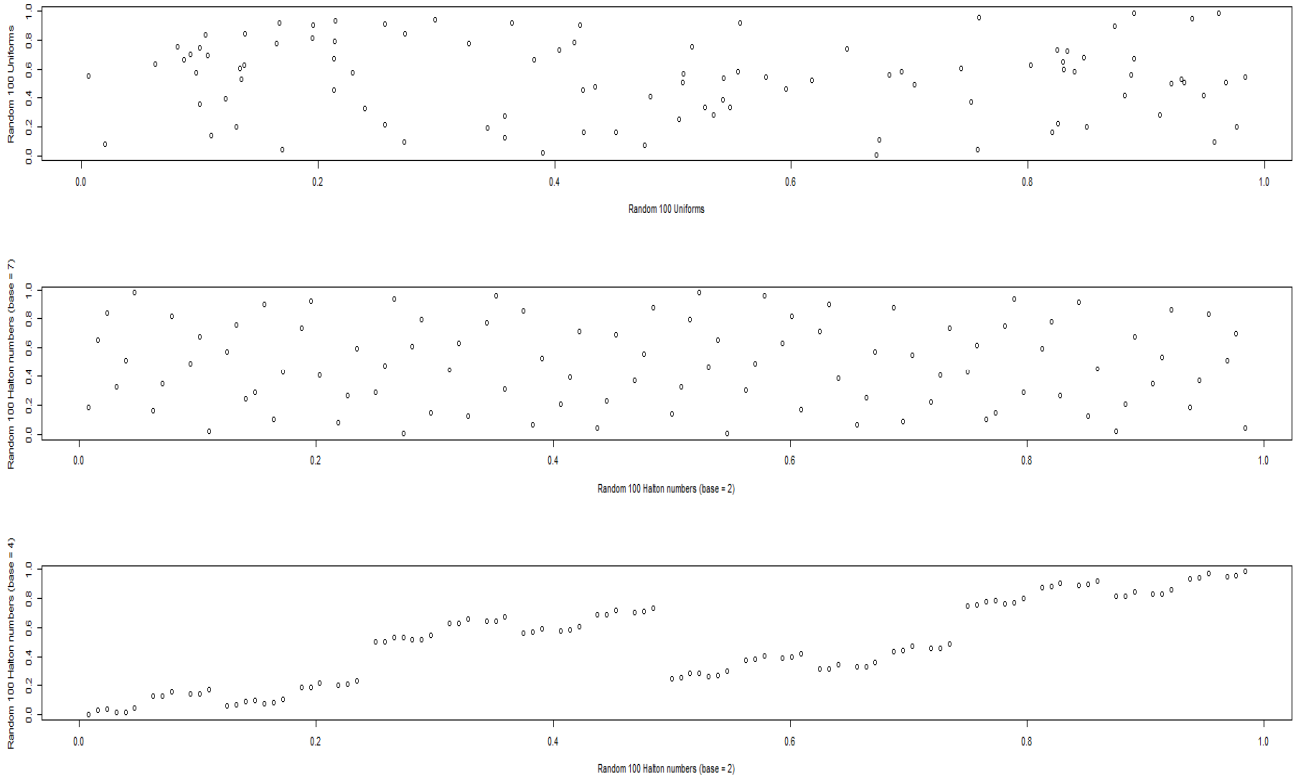
Rho (on an enlarged scale of S0: 10 to 30):



4- Solved in R

5-

(d)



The topmost graph is generated from uniform sequences, the middle from 2 dimensional Halton sequences with base 2 and 7 and the bottommost graph from 2 dimensional Halton sequences with base 2 and 4.

It can be observed that the middle graph replicates the topmost graphs by uniformly filling the space from 0 to 1 in both dimensions. However, the bottommost graph only fills some strips. This happens when one of the bases is a multiple of the other. This causes a repetition of pattern and the “pseudo-random” pattern is no longer random as it leaves a lot of empty space. This graph is undesirable because our aim is to replicate a uniform distribution.

This might give rise to errors in further applications which use uniform distributions (like computing double integrals).