Random number generation

File `random.csv`, has 3 columns and 500 rows, where each cell contains a random number uniformly distributed between 0 and 1, Consider the following distributions:

1. A continuous uniform distribution between [5, 15]
2. A discrete distribution, that returns the following values with the given probability

Value	Probability
5	0.3
10	0.4
15	0.3

3. An exponential distribution with average 10
4. An hyper-exponential distribution with two stages, characterized by
   $(\lambda_1 = 0.05, \lambda_2 = 0.175, p_1 = 0.3)$
5. An hypo-exponential distribution with two stages characterized by
   $(\lambda_1 = 0.25, \lambda_2 = 0.16667)$
6. An Hyper-Erlang characterized by the following branches, number of stages, rates and selection probabilities

Num. stages (k)	Rate (λ)	Probability
1	0.05	0.3
2	0.35	0.7

- For each distribution, generate N = 500 samples using the techniques seen during the course, taking samples from the uniform distribution from the cells of the enclosed file. In particular, use the first column for selecting branches for discrete distributions (cases 2, 4 and 6), and the other two columns for generating samples of continuous distributions.

  Hint: one single random number is required for cases 1, 2 and 3; two values are required for cases 4 and 5 – respectively columns one and two, and columns two and three; case 6 requires the use of all three values – one for selecting the branch, the one in column two for the first branch, and the ones in columns two and three for the second branch.

- Plot a figure where you compare the CDF from the generated samples, with the analytical one using the given parameters.