1: Inverse method for Poissson Distribution (25%)

For discrete Poisson Distribution ($\lambda = 5$),
the p.m.f is $P(x|\lambda) = e^{-\lambda}\frac{\lambda^x}{x!}$ and the c.d.f is $F(x|\lambda) = \sum_{t \leq x} e^{-\lambda}\frac{\lambda^t}{t!}$.

Algorithm: Inverse method for the Poisson Distribution:
To generate $X \sim F(x)$:
STEP 1: Generate $U \sim unif[0, 1]$;
STEP 2: Transform $X = F^{-}(U)$: if $F(x|\lambda) < U \leq F(x + 1|\lambda)$, let $X = x + 1$.
Plot :

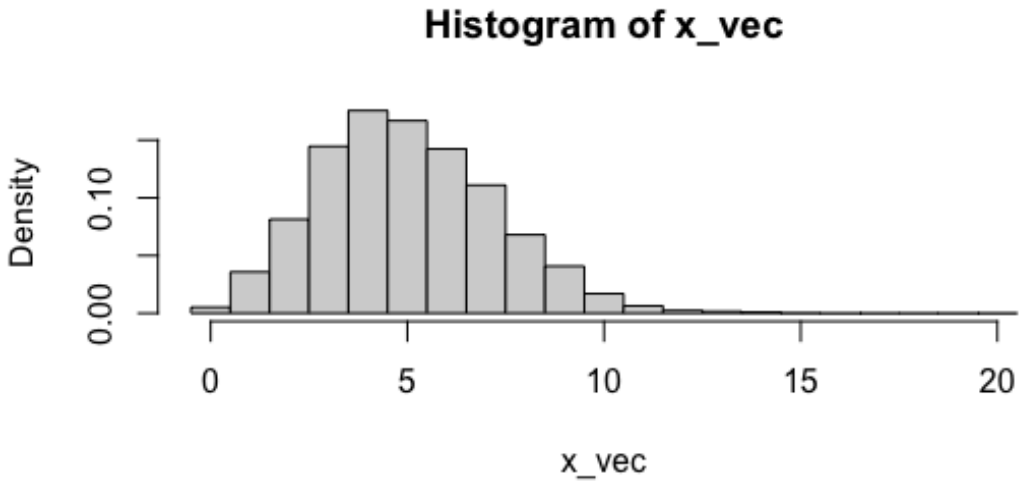

Figure 1: Histogram of 5000 samples

2: Accept-Reject method for truncated Gamma Distribution(25%)

(1)

(2)

3: Importance Sampling for Estimation(25%)

(1)

(2)

Algorithm:

Result:

4: Stratified Sampling25%)

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(1)

(2)

(3)