Stats Mid-Term Assignment

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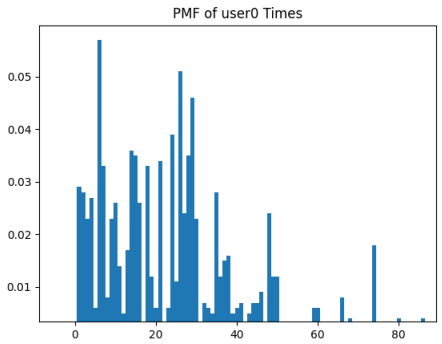
Q1(a)



Q1(b)

$Prob(X_0 = 1) = 0.582$

Q1(c)

Chebyshev:

$$\mu = 0.582, \sigma = \sqrt{\mu(1-\mu)} = 0.493, N = 1000$$

$$\mu - \frac{\sigma}{\sqrt{0.05N}} \leq X_0 \leq \mu + \frac{\sigma}{\sqrt{0.05N}} = 0.582 - \frac{0.493}{\sqrt{0.05(1000)}} \leq X_0 \leq 0.582 + \frac{0.493}{\sqrt{0.05(1000)}}$$

$$0.512 \leq X_0 \leq 0.651$$

CLT:

$$\frac{\frac{(X_1+X_2+...+X_n)}{n} - \mu}{\frac{\sigma}{\sqrt{n}}} =$$

Bootstrapping:

Q2

user1: 0.416 | **user2**: 0.399 | **user3**: 0.334

Q3

Using marginalisation and summing all the probabilites to get Z_n:

$$P(X_0 = 1)P(U_0) + P(X_1 = 1)P(U_1) + P(X_2 = 1)P(U_2) + P(X_3 = 1)P(U_3)$$

$$0.582(0.09742...) + 0.416(0.40468...) + 0.399(0.23529...) + 0.334(0.26260...)$$

$Z_n = 0.4066392298682297$