Quiz 1: CS 215

Name: ______Roll Number: _____

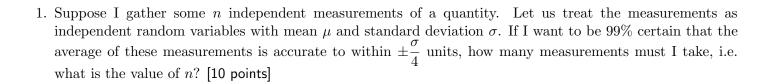
Attempt all four questions. Each question carries 10 points for a total of 40. Useful Information

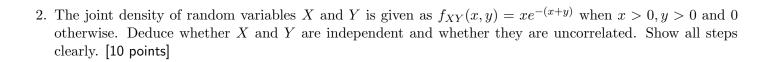
- 1. Binomial theorem: $(x+y)^n = \sum_{k=0}^n C(n,k) x^k y^{n-k}$
- 2. The empirical mean of n independent and identically distributed random variables is approximately Gaussian distributed. The approximation accuracy is better when n is larger.
- 3. Defining $\Phi(x) = \int_{-\infty}^{x} \frac{e^{-x^2/2}}{\sqrt{2\pi}} dx$, we have the following table:

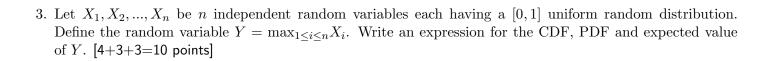
n	$\Phi(n) - \Phi(-n)$
1	68.2%
2	95.4%
2.6	99%
2.8	99.49%
3	99.73%

- 4. Integration by parts: $\int u dv = uv \int v du$.
- 5. Gaussian pdf: $f(x) = \frac{1}{\sigma\sqrt{2\pi}}e^{-(x-\mu)^2/(2\sigma^2)}$
- 6. Poisson pmf: $P(X = i) = \frac{e^{-\lambda}\lambda^i}{i!}$

Additional space







4.	Show that the sum of two Poisson random variable.	independent Poisson random variables with mean λ_1 and λ_2 respectively is another. What is its mean? Show all steps clearly. [10 points]

Additional space