LaTeX Generation From PDF Content

I want to generate a latex file
All the definations and notati
Any proofs and derivations in
and it should have a detailed

I have also attached a Scribe

Below is the LaTeX code generated based on the lecture material from "L6_S1_A.pdf," formatted according to the style of t

Code snippet

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\documentclass[11pt]{article}
\usepackage[margin=1in]{geometry}
\usepackage{amsmath, amsfonts, amssymb, amsthm}
\usepackage{graphicx}

\title{CSE 400: Fundamentals of Probability in Computing \\ Lecture 6: Discrete RVs, Expectation, and Pr
\author{Group-6 Scribe Refactoring}
\date{February 6, 2026}

\begin{document}

\maketitle

\section{Introduction to Random Variables}
A \textbf{Random Variable (RV)} $X$ on a sample space $\Omega$ is defined as a function $X: \Omega \to \

\subsection{Discrete Random Variables}
A random variable is considered \textbf{discrete} if it can take on at most a countable number of possib
\begin{itemize}
    \item \textbf{Support}: Countable (finite or countably infinite)[cite: 251].
    \item \textbf{Probability Mass Function (PMF)}: Defined as $P_X(x_k) = Pr(X = x_k)$ for $k = 1, 2, 3
    \item \textbf{Constraint}: The sum of all probabilities in a PMF must equal 1: $\sum_{k=1}^{\infty}
\end{itemize}

\section{Independent Events}
Two events $A$ and $B$ are \textbf{independent} if the occurrence of one does not provide information ab
\begin{itemize}
    \item \textbf{Mathematical Definition}: $Pr(A|B) = Pr(A)$ and $Pr(B|A) = Pr(B)$[cite: 583].
    \item \textbf{Joint Probability}: For independent events, $Pr(A, B) = Pr(A)Pr(B)$[cite: 583, 594].
    \item \textbf{Mutual Independence}: Three events $A, B,$ and $C$ are mutually independent if every p
\end{itemize}

\section{Derivations and Bayes' Theorem}
\subsection{Bayes' Formula Derivation}
Using the definition of conditional probability $Pr(AB_i) = Pr(B_i|A)Pr(A)$, we derive Bayes' Theorem[ci
\begin{equation}
    Pr(B_i|A) = \frac{Pr(A|B_i)Pr(B_i)}{\sum_{j=1}^{n} Pr(A|B_j)Pr(B_j)}
\end{equation}
Where $Pr(B_i)$ is the \textit{a priori} probability and $Pr(B_i|A)$ is the \textit{posteriori} probabil

\section{Types of Discrete Random Variables}

\subsection{Bernoulli Random Variable}
Models a single trial with two outcomes: Success (1) or Failure (0)[cite: 670, 679].
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```latex
\begin{itemize}
    \item \textbf{PMF}: $P_X(1) = p$, $P_X(0) = 1-p$[cite: 691].
    \item \textbf{Examples}: Tossing a coin, spam detection, or demographic classification[cite: 707, 70
\end{itemize}

\subsection{Binomial Random Variable}
Denoted as $B(n, p)$, it represents the number of successes in $n$ independent trials[cite: 732, 734].
\begin{itemize}
    \item \textbf{PMF Derivation}: $p(i) = \binom{n}{i}p^i(1-p)^{n-i}$ for $i=0, 1, \dots, n$[cite: 747]
    \item \textbf{Usage}: Number of defective items in a sample or correct answers on a test[cite: 761,
\end{itemize}

\subsection{Geometric Random Variable}
Represents the number of trials required to achieve the \textbf{first} success in a sequence of indepen
\begin{itemize}
    \item \textbf{PMF}: $P_X(X=n) = (1-p)^{n-1}p$[cite: 794].
    \item \textbf{Proof of PMF Summation}:
    \begin{equation}
        \sum_{n=1}^{\infty} Pr(X=n) = p \sum_{n=1}^{\infty} (1-p)^{n-1} = p \left( \frac{1}{1-(1-p)} \r
    \end{equation}
\end{itemize}

\subsection{Poisson Random Variable}
Models the number of rare events occurring in a fixed interval[cite: 260].
\begin{itemize}
    \item \textbf{PMF}: $p(i) = e^{-\lambda} \frac{\lambda^i}{i!}$ for $i=0, 1, 2, \dots$[cite: 837, 84
    \item \textbf{Constraint Proof}: $\sum_{i=0}^{\infty} e^{-\lambda} \frac{\lambda^i}{i!} = e^{-\lamb
    \item \textbf{Approximation}: Can approximate $B(n, p)$ when $n$ is large and $p$ is small[cite: 86
\end{itemize}

\section{Summary for Exam Review}
\begin{itemize}
    \item \textbf{RVs}: Understand mapping from Sample Space to Real Numbers[cite: 183].
    \item \textbf{Discrete vs. Continuous}: Discrete uses PMF (summation); Continuous uses PDF (integra
    \item \textbf{Independence}: Key requirement for Binomial and Geometric distributions[cite: 723, 77
    \item \textbf{Bayes' Theorem}: Crucial for updating probabilities based on observed evidence[cite: 
    \item \textbf{Key Distributions}:
    \begin{itemize}
        \item \textbf{Bernoulli}: 1 trial, 2 outcomes[cite: 668, 670].
        \item \textbf{Binomial}: $n$ trials, counting successes[cite: 732].
        \item \textbf{Geometric}: Waiting for the first success[cite: 779].
        \item \textbf{Poisson}: Rare events over time/space[cite: 260, 830].
    \end{itemize}
\end{itemize}

\end{document}
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Would you like me to create a table comparing the Mean (μ) and Variance (σ^2) for each of these discrete random variables