SYNOPSIS REPORT

On

Probability Distribution Calculator

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Project Proposal Approval Form (2020)

Minor | I |

PROJECT TITLE: Probability Distribution Calculator

ABSTRACT

Probability Distributions always seems to be very tiring and needs lots of calculations.
Therefore, we want to develop an application using C programming for calculating these distributions within seconds for the user.
The semester-long Project is divided into phases i.e. (Idea, Requirements, knowledge on concepts of Probability Distributions), Coding Implementation, Testing and Maintenance, Deployment etc.
This Project will be supervised by our mentor Manoj Kumar sir (AP-SS Department of Systematics).

KEYWORDS:

- Mean/Mode
- Variance
- Standard Deviation
- Binomial and Poisson
- MGF

INTRODUCTION:

All projects start with an idea for a product, service, new capability, or other desired outcome. This project is based on the idea for servicing the users by getting rid from the tiring and complex calculations. This project is based on C programing language.

It is a terminal-based application in which user input his probability distributions and get the desired output (Mean, Mode, Standard Deviation, Variance, Poisson Ratio, Moment Generating Functions, Sampling Data).

PROBLEM STATEMENT:

- Taking input from user (data could be an integer, decimal and fractional value).
- User should be asked to give input in certain constraints as set by by the coding team.
- User should get the output in the form of probability distributions (with required time complexity).
- Constraints and time limit should be defined by the development team.

LITERATURE REVIEW:

Title	Link	Remarks
C programming	https://www.cprogramming.com/	Concepts of C programming is well defined.
Probability Distributions	https://en.wikipedia.org/wiki/Probability_distribution	Concepts of Probability Distributions are well explained.
File Handling in C programming	https://www.geeksforgeeks.org/basics-file-handling-c/	File handling Concepts are well structured in easy manner.

OBJECTIVES:

The program will do the following tasks:

- Taking data from a file in the form of two strings and converting them to floating-point values.
- Data could be an integer, decimal or fractional value.
- Finding the Median and Mode of N integers.
- Input real numbers and Find the Mean, Variance, and Standard Deviation.
- Moment Generating Function for Discrete data.
- Binomial & Poisson distribution.
- Significance tests for sampling distributions.
- Program should pass all the valid test cases provided by the user with required time limit.

METHODOLOGY:

For this project, the language used is C.
The entire implementation of this project can be summarized into the following steps:

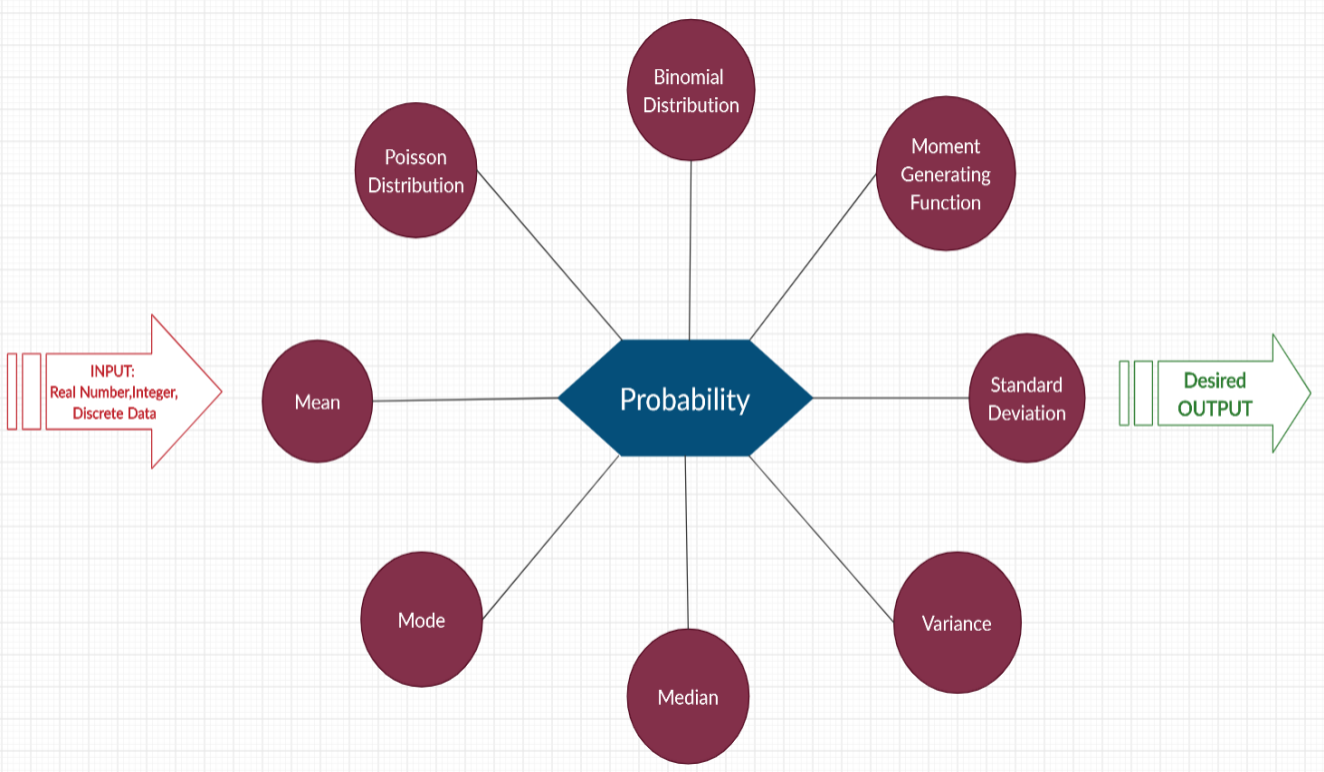
1. **Import the libraries and header file:** Libraries will be imported in coding implementation for the required use of logic.

2. **Taking the data from user**: Taking data from a file in the form of two strings and converting them to floating-point values. Data could be an integer, decimal or fractional value. User will input test case data (with given constraints) in the required format to get the required output.

3. **Uses of switch Cases**: Majorly program will be structured in different cases with switch method in C. Different Cases will be handled by different team members for calculating different Probability Distributions.

4. **Methodologies Required:** Good knowledge of methodologies for Mean, Mode, Standard Deviation, Binomial & Poisson distribution, Moment Generating Functions, Significance tests for sampling distributions will be required for the implementation of application.

PICTORIAL REPRESENTATION:



The above picture represents a basic idea behind the project and summarizes its major features describing an overall understanding of the projects, the inputs to take and the functions it will be providing after its completion.
It includes all key components except the Sampling part that is done on the basis of the result we get after the calculation of the required values.

SYSTEM REQUIREMENTS:

Hardware:

- RAM: 4-8GB
- Disk Space: 4GB

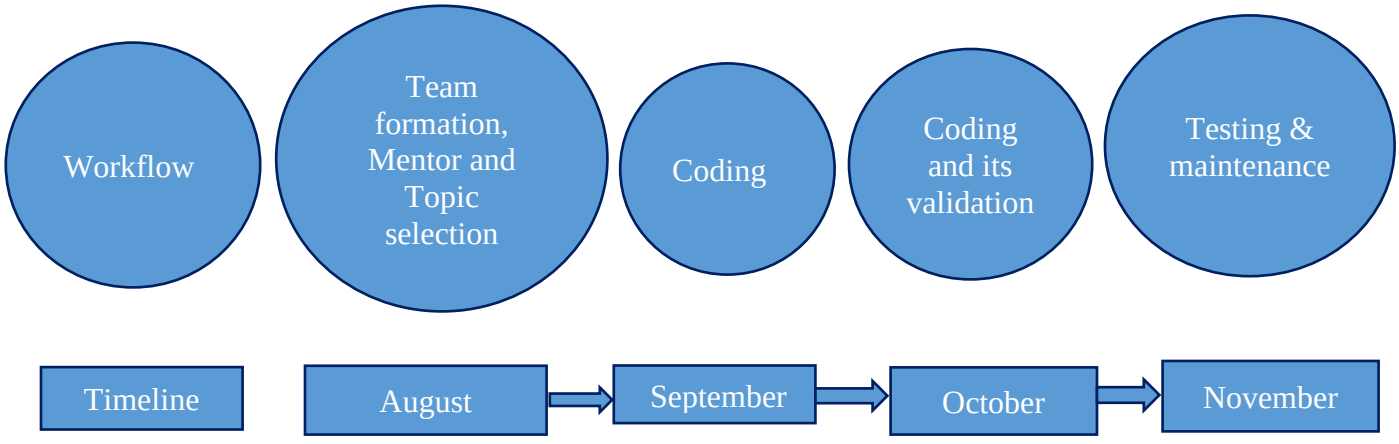
Software:

- **Compiler:** MinGW
- **Editor**: Notepad, Sublime Text, VScode, CodeBlocks.

Operating System:

- Windows.
- Linux.
- Mac OS.

SCHEDULE:



Pert Chart

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Synopsis Draft verified by

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