Probability and Statistics (IT302) Lab Program-8

Reg. No 181067181IT102 - 181163181IT121

Use any one of the programming languages C/C++/Python/Java/R to implement **Poisson Probability Sums.** Program should include a user-defined function that should compute *Poisson Probability Sum*. Further, it should consider only valid runtime inputs r=1,2,3…, n. μ=m, m+1, m+2, …, n where 'r', 'm' and 'n' are positive integer numbers. For invalid test case, it should display an error message on the terminal and the same should be stored on a separate output file with appropriate file name. For each valid test case it should display intermediate results as well as final output on terminal and also should store onto a separate output file with appropriate file name. Output must be stored in tabular form. For each test case save the screenshot of the output with appropriate filename.

Intermediate Result : $p(x; \mu)$ **Sample Test Case** : n = 6, m = 10

Reg. No 181163181IT122 – 181762181IT141

Use any one of the programming languages C/C++/Python/Java/R to implement **Binomial Probability Sums**. Program should include a user-defined function that should compute *Binomial Probability Sums*. Further, it should consider only valid runtime inputs r=0, 2, 3…, m where 'r', 'm' and 'n' are positive integer numbers and p=0.1, 0.2, 0.3, 04, 0.5, 0.6, 0.7, 0.8, 0.9. For invalid test case, it should display an error message on the terminal and the same should be stored on a separate output file with appropriate file name. For each valid test case it should display intermediate results as well as final output on terminal and also should store onto a separate output file with appropriate file name. Output must be stored in tabular form. For each test case save the screenshot of the output with appropriate filename.

Intermediate Result : $b(x; n, p)$ **Sample Test Case** : n =10, m= 10

Reg. No 181481181IT143 – 181625181IT209

"A" represents the average number of oil tankers arriving each day at a certain port. The facilities at the port can handle at most "B" number of tankers per day. Compute the probability that on a given day tankers have to be turned away using any one of the programming languages C/C++/Python/Java/R. Program should include a user-defined function that should compute **Poisson Probability Sums** and it **s**hould consider only valid runtime inputs. For invalid test case, it should display an error message on the terminal and the same should be stored on a separate output file with appropriate file name. For each valid test case it should display intermediate results as well as final output on terminal and also should store onto a separate output file with appropriate file name. For each test case save the screenshot of the output with appropriate filename.

Intermediate Results : $p(x; A)$ **Sample Test Case** : A=10 B=15

Reg. No. 181625181IT211 - 181034181IT232

Lots of "A" number of components each are deemed unacceptable if they contain "≥B" number of defectives. The procedure for sampling a lot is to select "C" number of components at random and to reject the lot if a defective is found. Compute the probability that exactly "D" number of defective is found in the sample if there are "B" number of defectives in the entire lot using any one of the programming languages C/C++/Python/Java/R. Computer mean and variance of the random variable, and then use Chebyshev's theorem to interpret the interval $\mu \pm 2\sigma$. Program should consider only valid runtime inputs. For invalid test case, it should display an error message on the terminal and the same should be stored on a separate output file with appropriate file name. For each valid test case it should display intermediate results as well as final output on terminal and also should store onto a separate output file with appropriate file name. For each test case save the screenshot of the output with appropriate filename.

Intermediate Results : Mean, Variance, Standard Deviation

Sample Test Case : A = 40 B = 3 C = 5 D = 2

Reg. No 1181579181IT233 - 181047181IT254, 15645415IT206

During a laboratory experiment, the average number of radioactive particles passing through a counter in one second is X. Compute the probability that Y particles enter the counter in a given second using any one of the programming languages C/C++/Python/Java/R. Program should consider only valid runtime inputs X and Y where both of them are positive integers. For invalid test case, it should display an error message on the terminal and the same should be stored on a separate output file with appropriate file name. For each valid test case it should display intermediate results as well as final output on terminal and also should store onto a separate output file with appropriate file name. For each test case save the screenshot of the output with appropriate filename.

Intermediate Results: Poisson Probability Sum **Sample Test Cases** ; X = 4, Y = 6

Email subject should be PAS(IT302)-Lab-Program-8-Related-Files

File name of the program : RegisterNo_IT302_P8 (P8 indicates Lab Program Number-8)

File name of the screenshot : RegisterNo_IT302_P8_TCS1

(TCS1 indicates screenshot for the first test case, similarly, for other test cases TCS2, TCS3, TCS4, TCS5, TCS6).

File name of the Output File : RegisterNo_IT302_P8_Output_TC1.txt

(TC1 indicates output for the first test case, similarly, for other test cases TC2, TC3, TC4, TC5, TC6)

Date of Online Laboratory : 19th October 2020, Monday

Deadline of Submission : 19th October 2020, Monday (on or before 6:00PM)

Submit program file, all screenshots and all output files to the Email ID mentioned in fourth column of the below Table.

Note:

- Clarify doubt(s) (if any) only on 19th October 2020 Monday at 2:00PM.
- No/Zero marks for incomplete submission/incomplete program.
- Appropriate marks will be deducted for any of the submission instructions violated.
- No/Zero Marks for submission to inappropriate evaluator.
- Only first submission will be considered for evaluation.
- Program should check all types of input conditions and not only restricted to given test case inputs. Otherwise appropriate marks will be deducted.
- Discuss with evaluator only on said date and time if any doubt(s) related to lab evaluation marks. No communication will be entertained on any mode (email/SMS/phone call etc.) on any day/time except give clarification schedule by the evaluator.
- Deduction of marks for late submission (after submission deadline)

6:01PM - 6:30 PM	0.5M
6:31PM - 7:00 PM	1M
7:01PM - 8:00 PM	2M
8:01PM - 9:00 PM	4M

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