

Paper Code: BS110P

Subject: Probability & Statistics for Engineers Lab

Time: 1.5 hour

Max Marks: 50?

Note: All questions are compulsory.

1. Solve the following system of equations:

$$x + y + z = 3$$

$$2x - y + 3z = 4$$

$$3x - 2y + z = 0$$

Program:	
1	A <- matrix(c(1, 2, 3, 1, -1, -2, 1, 3, 1), ncol=3)
2	b <- matrix(c(3, 4, 0))
3	solve(A, b)
Output:	
1	[,1]
2	[1,] 0.2727273
3	[2,] 1.1818182
4	[3,] 1.5454545

2. Create 30 random numbers from binomial distribution B(40,0.25).

Program:	
1	rbinom(30, size=40, prob=0.25)
Output:	
1	[1] 9 7 6 10 6 9 10 10 11 13 11 6 7 12 11 6 14 10
2	[19] 11 11 8 10 5 10 8 7 12 9 12 11

3. Create two matrices of order 3x4. Add and subtract them. Also, find the transpose of both matrices.

Program:	
1	a <- matrix(1:12, nrow=3)
2	b <- matrix(1:12, nrow=3, byrow=TRUE)
3	
4	a + b
5	a - b
6	
7	t(a)
8	t(b)

Output:					
1		[,1]	[,2]	[,3]	[,4]
2	[1,]	2	6	10	14
3	[2,]	7	11	15	19
4	[3,]	12	16	20	24
5		[,1]	[,2]	[,3]	[,4]
6	[1,]	0	2	4	6
7	[2,]	-3	-1	1	3
8	[3,]	-6	-4	-2	0
9		[,1]	[,2]	[,3]	
10	[1,]	1	2	3	
11	[2,]	4	5	6	
12	[3,]	7	8	9	
13	[4,]	10	11	12	
14		[,1]	[,2]	[,3]	
15	[1,]	1	5	9	
16	[2,]	2	6	10	
17	[3,]	3	7	11	
18	[4,]	4	8	12	

4. Create a data frame of 5 scholars with their names, marks in project 1, project 2, project 3. Find mean and variance of project 2.

Program:	
1	dataset <- data.frame(2 "Project1" = c(77, 83, 93, 67, 89), 3 "Project2" = c(50, 79, 89, 29, 84), 4 "Project3" = c(92, 95, 99, 81, 98), 5 row.names = c("Alice", "Bob", "Eve", "John", "Jane") 6) 7 8 project2_marks <- dataset[,2] 9 mean(project2_marks) 10 var(project2_marks)
Output:	
1	[1] 66.2
2	[1] 661.7

5. Draw histogram of:

CI	0-25	25-50	50-75	75-100	100-125
f	5	8	13	11	3

Program:

```
1 barplot(  
2   height=c(5, 8, 13, 11, 3),  
3   names.arg = c("0-25", "25-50", "50-75", "75-100", "100-125"),  
4   xlab="CI",  
5   ylab="f"  
6 )
```

