



Daffodil International University
Department of Business Administration
Faculty of Business and Entrepreneurship
Semester Final Examination, Fall 2024

Course Code: 0542-213, Course Title: Statistics for Decision-Making
Teachers' Initials: DMSA, AS, UFU

Time: 02:00 Hours

Marks: 40

[Answer all the following questions. The figures in the right margin indicate the full marks and corresponding course outcomes]

1.	a)	Explain six-step procedure for testing a hypothesis ✓	[3]	CLO 1, 3 L-2, 4																														
	b)	Distinguish between variable and random variable \	[2]																															
	c)	Define correlation and regression with example. \	[2]																															
2	a)	<p>A survey of 545 college students asked: What is your favorite winter sport? And what type of college do you attend? The results are summarize below:</p> <table><tr><td></td><td>Favorite</td><td>Winter</td><td>Sport</td><td></td></tr><tr><td>College type</td><td>Snowboarding</td><td>Skiing</td><td>ICE Scatting</td><td>Total</td></tr><tr><td>Junior College</td><td>68</td><td>41</td><td>46</td><td>155</td></tr><tr><td>Four-Year College</td><td>84</td><td>56</td><td>70</td><td>210</td></tr><tr><td>Graduate School</td><td>59</td><td>74</td><td>47</td><td>180</td></tr><tr><td>Total</td><td>211</td><td>171</td><td>163</td><td>545</td></tr></table> <p>If, a student is selected randomly, Identify the below probabilities; ii) The student's favorite game is skiing and he is a junior college student, iii) If the student selected is a four year college student, what is the probability that the student prefer ICE skating?</p>		Favorite	Winter	Sport		College type	Snowboarding	Skiing	ICE Scatting	Total	Junior College	68	41	46	155	Four-Year College	84	56	70	210	Graduate School	59	74	47	180	Total	211	171	163	545	[3]	CLO 2 L-3
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	b)	The chair of the board of directors says, "There is a 50% chance this company will earn a profit, a 30% chance it will break even, and a 20% chance it will lose money next quarter." Identify the chance the company will not lose money next quarter.	[2]	CLO 2 L-3																														
	c)	<p>The Auto World sells new cars for Toyota. The Auto World sells the largest number of cars on Saturday. He has developed the following probability distribution for the number of cars he expects to sell on a particular Saturday:</p> <table><tr><td>No. of cars sold</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Probability</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.3</td><td>0.1</td></tr></table> <p>Identify the mean and standard deviation from above data.</p>	No. of cars sold	0	1	2	3	4	Probability	0.1	0.2	0.3	0.3	0.1	[3]	CLO 2 L-3																		
No. of cars sold	0	1	2	3	4																													
Probability	0.1	0.2	0.3	0.3	0.1																													
3.		<p>Suppose, the monthly demand for potatoes (in '000 metric tons) and the corresponding supply (in '000 metric tons) of Dhaka city are shown below:</p> <table><tr><td>Demand</td><td>10</td><td>20</td><td>40</td><td>50</td><td>70</td><td>90</td><td>110</td></tr><tr><td>Supply</td><td>8</td><td>25</td><td>55</td><td>62</td><td>68</td><td>70</td><td>85</td></tr></table>	Demand	10	20	40	50	70	90	110	Supply	8	25	55	62	68	70	85		CLO 2 L-3														
Demand	10	20	40	50	70	90	110																											
Supply	8	25	55	62	68	70	85																											
	a)	Identify the regression coefficient. Build the estimated regression line/model	✓ [5]																															
	b)	Analyze the supply when demand goes to 100 thousand metric tons.	✓ [2]	CLO 3 L-4																														
	c)	Identify the correlation coefficient "r" and explain your findings.	✓ [3]	CLO 2 L-3																														

4.	a)	The price of rice in Bangladesh was found to follow a normal distribution with a mean of 60 taka and a variance of 10. Identify the probability that i) the price of rice is between 65 to 75 taka; ii) the price is less than 68 taka; iii) The price is less than 55 taka.	[5]	CLO 2 L-3
	b)	A box of shirts consists 10 pieces of shirts; 7 are white color and 3 are black color. In a sample of 4 shirts, solve the probability that exactly 2 are white shirts. Assume the samples are drawn without replacement.	[3] ✓	CLO 2 L-3
	c)	In the past, schools in Los Angeles County have closed an average of 3 days each year for weather emergencies. Solve the probability that schools in Los Angeles County will close 4 days next year	[3] ✓	CLO 2 L-3
	d)	Rahimafrooz Bangladesh Ltd wants to test the claim that their batteries last more than 40 hours. Using a simple random sample of 15 batteries yielded a mean of 44.9 hours, with a standard deviation of 8.9 hours. Test this claim using a significance level of 0.05. Can we assume that battery performance is more than 40 hours?	[4] ✓	CLO 4 L-5

	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990

TABLE A-3		t Distribution: Critical t Values				
Degrees of Freedom	Area in One Tail					
	0.005	0.01	0.025	0.05	0.10	
Degrees of Freedom	Area in Two Tails					
	0.01	0.02	0.05	0.10	0.20	
1	63.657	31.821	12.706	6.314	3.078	
2	9.925	6.965	4.303	2.920	1.886	
3	5.841	4.541	3.182	2.353	1.638	
4	4.604	3.747	2.776	2.132	1.533	
5	4.032	3.365	2.571	2.015	1.476	
6	3.707	3.143	2.447	1.943	1.440	
7	3.499	2.998	2.365	1.895	1.415	
8	3.355	2.896	2.306	1.860	1.397	
9	3.250	2.821	2.262	1.833	1.383	
10	3.169	2.764	2.228	1.812	1.372	
11	3.106	2.718	2.201	1.796	1.363	
12	3.055	2.681	2.179	1.782	1.356	
13	3.012	2.650	2.160	1.771	1.350	
14	2.977	2.624	2.145	1.761	1.345	
15	2.947	2.602	2.131	1.753	1.341	
16	2.921	2.583	2.120	1.746	1.337	
17	2.898	2.567	2.110	1.740	1.333	
18	2.878	2.552	2.101	1.734	1.330	
19	2.861	2.539	2.093	1.729	1.328	
20	2.845	2.528	2.086	1.725	1.325	
21	2.831	2.518	2.080	1.721	1.323	
22	2.819	2.508	2.074	1.717	1.321	
23	2.807	2.500	2.069	1.714	1.319	
24	2.797	2.492	2.064	1.711	1.318	
25	2.787	2.485	2.060	1.708	1.316	
26	2.779	2.479	2.056	1.705	1.314	
27	2.771	2.473	2.052	1.703	1.314	
28	2.763	2.467	2.048	1.701	1.313	
29	2.756	2.462	2.045	1.699	1.311	
30	2.750	2.457	2.042	1.697	1.310	
31	2.744	2.453	2.040	1.696	1.309	
32	2.738	2.449	2.037	1.694	1.309	
34	2.728	2.441	2.032	1.691	1.307	
36	2.719	2.434	2.028	1.688	1.306	
38	2.712	2.429	2.024	1.686	1.304	
40	2.704	2.423	2.021	1.684	1.303	
45	2.690	2.412	2.014	1.679	1.301	
50	2.678	2.403	2.009	1.676	1.299	
55	2.668	2.396	2.004	1.673	1.297	
60	2.660	2.390	2.000	1.671	1.296	
65	2.654	2.385	1.997	1.669	1.295	
70	2.648	2.381	1.994	1.667	1.294	
75	2.643	2.377	1.992	1.665	1.293	
80	2.639	2.374	1.990	1.664	1.292	
90	2.632	2.368	1.987	1.662	1.291	
100	2.626	2.364	1.984	1.660	1.290	
200	2.601	2.345	1.972	1.653	1.286	
300	2.592	2.339	1.968	1.650	1.284	
400	2.588	2.336	1.966	1.649	1.284	
500	2.586	2.334	1.965	1.648	1.283	
750	2.582	2.331	1.963	1.647	1.283	
1000	2.581	2.330	1.962	1.646	1.282	
2000	2.578	2.328	1.961	1.646	1.282	
Large	2.576	2.326	1.960	1.645	1.282	