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3 Simulation/COM

VENKATTESH. B. IYER
B. N. Bandodkar. College (07-09 Batch)

CSXI/3844-05. PD—2022

(3 Hours) [Total Marks : 75

N. B.: 1. Attempt any FIVE questions but not more than THREE questions from any section.
2. Answers to the two sections must be written in separate answer books and should be submitted separately.
3. Figures to the right indicate full marks. Each question is of 15 marks.
4. Use of non-programmable calculator is allowed in the Examination Hall.
5. Use random numbers provided in printed sheet only (generated horizontally).

Section - I

30 a. Mention steps involved in modeling a computerized simulation study? 8

b. Mention the important steps to simulate the following problem on computer using C program or Excel commands. 7 120

A bread vendor buys every morning loaves of bread at Rs. 0.75/- each by placing his order one day in advance (at the time of receiving his previous order) and sell them at Rs.1.70/- each of fresh bread and Rs.0.50/- each of one day old bread. Unsold bread can be treated as of no values. The pattern of demand for bread is given below:

FRESH BREAD		ONE DAY OLD BREAD	
Daily sales	Probability of demand	Daily Sales	Probability of demand
51	0.13	0	0.70
52	0.19	1	0.20
53	0.27	2	0.08
54	0.32	3	0.02
55	0.09		

The vendor adopts the following order rule. If there is no stock with him at the end of the previous day, he orders 55 units. Otherwise the orders 51 or 53 whichever is nearest the actual fresh bread sale on the previous day. Starting with zero stock and a pending order for 53 loaves simulate for 10 days and calculate the vendor's profits.

OR

23 2. a. What are the areas of application of simulation? 8

b. Explain along with the assumption to write 'C' Program to simulate on computer the following game between two players (called the game of matching coins). Two players simultaneously flip a coin each. If both sides are same (both heads or both tails) player A wins Rs 10/- from B, otherwise B wins Rs 10 from A. Each player starts with Rs.100/- the game should be continued either 10 times or before any one of the broke. Who is benefited in a simulated run of 10? 7

3. a. Consider a grocery store with one check out counter, construct the snap shot or otherwise the algorithm for giving the performance measures i) average waiting time, ii) probability that a customer has to wait, iii) probability of idle server, iv) average service time of simulated situation till the clock reaches to 30, using the inter arrival and service times given below in the order shown. 8

Interarrival times 1, 5, 6, 3, 8
Service time 3, 5, 4, 1, 5

115 b. Explain the features of simulation software package. 7

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4. a. Explain the procedure hence or otherwise give the code to apply chi square check whether sequence of 50 random numbers given below are unifo distributed or not. Use 5% level of significance for the chi square test. Consider t class intervals namely (0, 0.20), (0.20, 0.40), (0.40, 0.60), (0.60, 0.80), (0.80, 1.0

280

0.41,	0.68,	0.89,	0.84,	0.74,	0.91,	0.55,	[illegible]	[illegible]	0.30,
0.09,	0.72,	0.86,	0.08,	0.54,	0.02,	0.11,	0.29,	0.16,	0.18,
0.88,	0.91,	0.95,	0.69,	0.09,	0.38,	0.23,	0.32,	0.91,	0.53,
0.31,	0.42,	0.73,	0.12,	0.74,	0.45,	0.13,	0.47,	0.58,	0.29,
0.12,	0.13,	0.29,	0.30,	0.38,	0.54,	0.68,	0.86,	0.88,	0.91,

b. Explain the principle of generation of random variable with specific distribution through Inverse Transformation technique. Generate 3 random variate following triangular distribution as given below.

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$$f(x) = \begin{cases} x, & 0 \le x \le 1 \\ 2-x, & 1 < x \le 2 \\ 0, & otherwise \end{cases}$$

5. a. State the probability mass function of a binomial variate. Under which situation it is applied?

A production process manufactures computer chips on the average at 2% non-conforming. Every day a random sample of size 50 is taken from the process. If the sample contains more than two nonconforming chips, the process will be stopped.

i) Determine the probability that the process is stopped by the sampling scheme.
ii) If the sample size is altered to 30 whether the process to stopping probability is increase or decreased

377 b. Justify the need of calibration and validation in a simulation model building.

OR

6. a. For the inventory model two different (M-maximum inventory level N - the length of the cycle) policies in terms effect on expected average total cost yields per month for 120 first months operation, where initial inventory level is 60. For first policy (20, 40) and second policy (0, 80) X_{ij} denotes total average cost per month of policy i on the jth independent replication. Using t test, conclude whether policy 2 is superior to policy 1. Also obtain 90% confidence limit to say μ_1 differs from μ_2.

j	X_{1j}	X_{2j}
1	126.97	118.15
2	124.31	120.22
3	126.45	122.24
4	123.32	120.89
5	127.23	188.95

Do you know any modified approach to test when pair up observation of two systems is not available?

b. Mention in details about any case study in the area of computerized simulation.

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Com

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JNI

Section II

Chp7 a. Enlist and explain the properties of data that favor centralizing objects. ★Nble 7

63 68 b. Explain in detail the COM Interface Definition Language 8

OR

8 a. What are the different activation models to bring COM objects into memory? Explain in-process activation in detail. ★★Nble 7

124

Xerox b. Explain the relationship among the EJB server, container and bean. 8

Xerox 9 a. What is JNI? What are the situations when JNI can be used? 7

72-75 b. Write and explain the various rules of IUnknown. 8 15

OR

10 a. Explain the concept of Stubs and Skeletons in CORBA with the help of appropriate diagram. 7

Xerox

Xerox b. Explain the following services of CORBA. 8

Object Web 11 a. How will you integrate a COM component in a Web application? 7

Apt. b. Explain the relation between Thread, Apartment, Process and Object in detail. 8

OR

12 a. What are the three simple axioms associated with COM's reference counting rules? Give the common situations that require calling the AddRef method. 7

77-78

b. Write short notes on: 8

(i) MTA and STA. paper } Apartments

Xerox (ii) Cross apartment access.

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Table 1 Random Digits

94737	08225	35614	24826	88319	05595	58701	57365	74759
87259	85982	132[illegible]	[illegible]326	74863	99986	68558	06391	59248
63856	14016	18527	11634	96908	52146	53496	51730	03500
66612	54714	46783	61934	30258	61674	07471	67566	31635
30712	58582	05704	23172	86689	94834	99057	55832	21023
69607	24145	43886	86477	05[illegible]37	36443	33456	34029	09603
37792	27282	94107	41967	21425	04743	42822	28111	09757
01488	56680	73847	64930	11108	44834	45390	86043	23973
66248	97697	38244	50918	55441	51217	54786	04940	50807
51453	03462	61157	65366	61130	26204	15016	85665	97714
92168	82530	19271	86999	96499	12765	20926	25282	39119
36463	07331	54590	00546	03337	41583	46439	40173	46455
47097	78780	04210	87084	44484	75377	57753	41415	09890
80400	45972	44111	99708	45935	03694	81421	60170	58457
94554	13863	88239	91624	00022	40471	78462	96265	55360
31567	53597	08490	73544	72573	30961	12282	97033	13676
07821	24759	47266	21747	72496	77755	50391	59554	31177
09056	10709	69314	11449	40531	02917	95878	74587	60906
19922	37025	80731	26179	16039	01518	82697	73227	13160
29923	02570	80164	36108	73689	26342	35712	49137	13482
29602	29464	99219	20308	82109	03898	82072	85199	13103
94135	94661	87724	88187	62191	70607	63099	40494	49069
87926	34092	34334	55064	43152	01610	03126	47312	59578
85039	19212	59160	83537	54414	19856	90527	21756	64783
66070	38480	74636	45095	86576	79337	39578	40851	53503
78166	82521	79961	12570	10930	47564	77869	16480	43972
94672	07912	26153	10531	12715	63142	88937	94466	31388
56406	70023	27734	22254	27685	67518	63966	33203	70803
67726	57805	94264	77009	08682	18784	47554	59869	66320
07516	45979	76735	46509	17696	67177	92600	55572	17245
43070	22671	00152	81326	89428	16368	57659	79424	57604
36917	60370	80812	87225	02850	47118	23790	55043	75117
03919	82972	02312	31106	44335	05573	17470	25900	91080
46724	22558	64303	78304	05762	70650	56117	06707	90035
16108	61281	86823	20286	14025	24909	38391	12183	89393
74541	75808	89669	87680	72758	60851	55292	95663	88326
82919	31285	01850	72550	42986	57518	01159	01786	98145
31388	26809	77258	99360	92362	21979	41319	75739	98082
17190	75522	15687	07161	99745	48767	03121	20046	28913
00466	88068	68631	98745	97810	35886	14497	90230	69264

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