

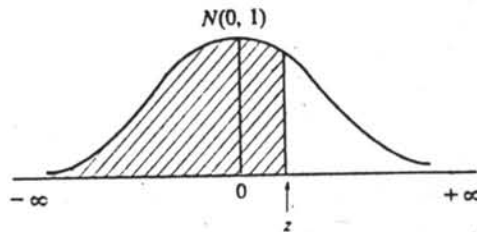
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ภาคผนวก ก.

ตารางสถิติที่เกี่ยวข้อง

## Cumulative distribution function for the standard normal distribution(SND)



For the SND, the table gives the cdf value at  $z$ , that is,

$$\int_{-\infty}^z N(0, 1) dz$$

$z$	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.5	0.00023	0.00022	0.00022	0.00021	0.00020	0.00019	0.00019	0.00018	0.00017	0.00017
-3.4	0.00034	0.00033	0.00031	0.00030	0.00029	0.00028	0.00027	0.00026	0.00025	0.00024
-3.3	0.00048	0.00047	0.00045	0.00043	0.00042	0.00040	0.00039	0.00038	0.00036	0.00035
-3.2	0.00069	0.00066	0.00064	0.00062	0.00060	0.00058	0.00056	0.00054	0.00052	0.00050
-3.1	0.00097	0.00094	0.00090	0.00087	0.00085	0.00082	0.00079	0.00076	0.00074	0.00071
-3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00104	0.00100
-2.9	0.0019	0.0018	0.0017	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1057	0.1038	0.1020	0.1003	0.0985
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.7	0.2420	0.2389	0.2358	0.2327	0.2297	0.2266	0.2236	0.2207	0.2177	0.2148
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
-0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641

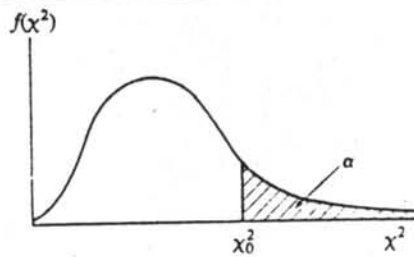
ตารางที่ 1 พื้นที่ภายใต้โค้งปกติแบบมาตรฐาน

Cumulative distribution function for the standard normal distribution(SND)

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
+0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
+0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
+0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
+0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
+0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6870
+0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
+0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
+0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
+0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8079	0.8106	0.8133
+0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
+1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
+1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
+1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
+1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
+1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
+1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
+1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
+1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
+1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
+1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
+2.0	0.9773	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
+2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
+2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
+2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
+2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
+2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
+2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
+2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
+2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
+2.9	0.9981	0.9982	0.9983	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
+3.0	0.99865	0.99869	0.99874	0.99878	0.99882	0.99886	0.99889	0.99893	0.99896	0.99900
+3.1	0.99903	0.99906	0.99910	0.99913	0.99915	0.99918	0.99921	0.99924	0.99926	0.99929
+3.2	0.99931	0.99934	0.99936	0.99938	0.99940	0.99942	0.99944	0.99946	0.99948	0.99950
+3.3	0.99952	0.99953	0.99955	0.99957	0.99958	0.99960	0.99961	0.99962	0.99964	0.99965
+3.4	0.99966	0.99967	0.99969	0.99970	0.99971	0.99972	0.99973	0.99974	0.99975	0.99976
+3.5	0.99977	0.99978	0.99978	0.99979	0.99980	0.99981	0.99981	0.99982	0.99983	0.99983

ตารางที่ 1 (ต่อ) พื้นที่ภายใต้โค้งปกติแบบมาตรฐาน

The  $\chi^2$  Distribution



Given  $\nu$ , the table gives the  $\chi_0^2$  value with  $\alpha$  of the area above it; that is,

$$P(\chi^2 \geq \chi_0^2) = \alpha$$

$\nu \backslash \alpha$	0.995	0.990	0.975	0.950	0.900	0.500	0.100	0.050	0.025	0.010	0.005
1	0.00	0.00	0.00	0.00	0.02	0.45	2.71	3.84	5.02	6.63	7.88
2	0.01	0.02	0.05	0.10	0.21	1.39	4.61	5.99	7.38	9.21	10.60
3	0.07	0.11	0.22	0.35	0.58	2.37	6.25	7.81	9.35	11.34	12.84
4	0.21	0.30	0.48	0.71	1.06	3.36	7.78	9.49	11.14	13.28	14.86
5	0.41	0.55	0.83	1.15	1.61	4.35	9.24	11.07	12.83	15.09	16.75
6	0.68	0.87	1.24	1.64	2.20	5.35	10.65	12.59	14.45	16.81	18.55
7	0.99	1.24	1.69	2.17	2.83	6.35	12.02	14.07	16.01	18.48	20.28
8	1.34	1.65	2.18	2.73	3.49	7.34	13.36	15.51	17.53	20.09	21.96
9	1.73	2.09	2.70	3.33	4.17	8.34	14.68	16.92	19.02	21.67	23.59
10	2.16	2.56	3.25	3.94	4.87	9.34	15.99	18.31	20.48	23.21	25.19
11	2.60	3.05	3.82	4.57	5.58	10.34	17.28	19.68	21.92	24.72	26.76
12	3.07	3.57	4.40	5.23	6.30	11.34	18.55	21.03	23.34	26.22	28.30
13	3.57	4.11	5.01	5.89	7.04	12.34	19.81	22.36	24.74	27.69	29.82
14	4.07	4.66	5.63	6.57	7.79	13.34	21.06	23.68	26.12	29.14	31.32
15	4.60	5.23	6.27	7.26	8.55	14.34	22.31	25.00	27.49	30.58	32.80
16	5.14	5.81	6.91	7.96	9.31	15.34	23.54	26.30	28.85	32.00	34.27
17	5.70	6.41	7.56	8.67	10.09	16.34	24.77	27.59	30.19	33.41	35.72
18	6.26	7.01	8.23	9.39	10.87	17.34	25.99	28.87	31.53	34.81	37.16
19	6.84	7.63	8.91	10.12	11.65	18.34	27.20	30.14	32.85	36.19	38.58
20	7.43	8.26	9.59	10.85	12.44	19.38	28.41	31.41	34.17	37.57	40.00
21	8.03	8.90	10.28	11.50	13.24	20.38	29.62	32.67	35.48	38.93	41.40
22	8.64	9.54	10.98	12.34	14.04	21.34	30.81	33.92	36.78	40.29	42.80
23	9.26	10.20	11.69	13.09	14.85	22.34	32.01	35.17	38.08	41.64	44.18
24	9.89	10.86	12.40	13.85	15.66	23.34	33.20	36.42	39.36	42.98	45.56
25	10.52	11.52	13.12	14.61	16.47	24.34	34.38	37.65	40.65	44.31	46.93
26	11.16	12.20	13.84	15.38	17.29	25.34	35.56	38.89	41.92	45.64	48.29
27	11.81	12.88	14.57	16.15	18.11	26.34	36.74	40.11	43.19	46.96	49.65
28	12.46	13.57	15.31	16.93	18.94	27.34	37.92	41.34	44.46	48.28	50.99
29	13.12	14.26	16.05	17.71	19.77	28.34	39.09	42.56	45.72	49.59	52.34
30	13.79	14.95	16.79	18.49	20.60	29.34	40.26	43.77	46.98	50.89	53.67
40	20.71	22.16	24.43	26.51	29.05	39.34	51.80	55.76	59.34	63.69	66.77
50	27.99	29.71	32.36	34.76	37.69	49.33	63.17	67.50	71.42	76.15	79.49
70	43.28	45.44	48.76	51.74	55.33	69.33	85.53	90.53	95.02	100.42	104.22
100	67.33	70.06	74.22	77.93	82.36	99.33	118.50	124.34	129.56	135.81	140.17

$\chi^2$  עמאטורע-נאנאנא 2 תינאנא



Random normal numbers  $\mu = 0, \sigma = 1.$

1.38	-1.73	0.33	0.24	-0.29	1.93	-1.40	0.51	0.71
-0.77	-0.69	1.32	-0.93	-1.14	-0.06	-0.35	1.04	0.10
-0.48	0.06	0.43	-0.24	2.63	0.65	-0.38	1.25	0.43
-0.92	0.53	0.51	0.65	-0.40	0.68	0.05	-0.45	-0.00
-0.89	-0.04	-0.01	1.64	1.46	-0.14	0.36	0.43	-0.08
-1.02	0.64	-0.13	0.22	-0.94	-0.64	-0.00	-0.31	0.45
1.61	0.42	1.19	-1.98	1.04	-0.69	-0.83	-0.78	-1.13
0.40	-0.38	-0.92	-1.11	-0.01	1.10	-1.83	-0.57	0.93
0.74	-1.36	-1.60	-0.35	-1.78	1.17	-0.73	-0.87	0.80
-1.96	-0.93	0.91	-0.72	0.08	-0.61	-0.89	1.04	-3.33
1.39	-0.61	-0.98	0.76	-1.22	0.99	-1.29	-0.12	-1.15
1.70	-0.83	-0.91	0.43	-1.11	0.04	-1.96	-0.06	0.47
-0.51	0.93	-0.67	0.92	-0.72	-0.47	0.15	0.30	0.71
-1.85	-0.52	-0.79	0.66	1.70	-1.02	1.82	-0.42	-0.38
-0.13	-0.13	-0.55	-0.07	-2.08	-0.35	-0.17	0.20	-0.51
-1.99	-1.14	-0.42	0.46	-0.61	-0.78	0.77	0.33	0.76
0.15	0.02	0.10	-0.33	-0.52	0.18	0.38	0.23	0.56
-0.38	0.32	0.11	-0.65	0.30	-0.36	0.54	0.33	-1.26
0.62	0.32	-1.42	1.01	0.10	-0.20	0.71	-1.25	-0.52
-1.09	-0.09	0.17	1.75	-0.86	0.93	-0.98	0.41	-0.48
1.08	0.64	-0.42	0.66	0.24	-0.08	-1.10	0.74	1.83
-0.70	0.59	-1.50	-0.13	0.81	0.43	0.21	-0.09	-0.98
1.76	-0.25	1.08	0.06	-0.50	-0.46	0.06	0.64	0.10
-1.45	0.10	2.04	-1.40	0.34	0.02	-1.94	-0.41	-0.99
-0.82	0.11	-1.78	0.23	-0.47	0.13	-0.78	1.24	0.56
-0.36	-0.14	-0.16	1.33	-0.28	-1.01	-0.63	-0.52	2.00
0.01	-0.23	-1.82	0.69	-0.12	0.51	-0.82	-0.44	0.85
-1.36	-0.20	0.92	-1.10	-0.23	1.90	-0.32	-0.21	1.08
-0.06	-0.73	1.03	-0.72	-0.10	-2.27	0.41	0.69	1.34
-2.39	-0.74	-0.84	-0.60	0.07	0.50	1.10	-1.25	-0.19
-1.40	-0.49	-0.35	-0.91	1.57	-1.08	-0.09	-0.27	-1.98
0.45	1.90	0.13	-0.90	-0.23	-1.44	0.24	-0.48	-0.89
0.38	-0.43	0.57	0.27	1.44	-0.79	1.10	0.60	1.34
-1.22	1.50	1.03	-1.71	0.50	-0.26	-1.96	-0.97	-0.88
2.36	-0.32	0.86	-0.02	-2.56	0.55	-0.33	-0.03	-0.35
0.82	0.89	0.53	-0.81	2.23	-0.48	-0.32	2.86	1.08
0.12	1.00	-1.01	0.22	0.81	0.62	1.48	-0.93	-2.71
0.26	-1.18	0.62	-0.20	0.17	0.01	-0.59	-0.85	0.18
-0.33	0.56	-0.28	-1.31	-1.06	-1.28	-0.57	-0.36	0.55
3.14	-0.20	1.54	-1.24	-2.39	-1.11	-0.52	-0.57	0.50
1.31	-0.90	-0.04	-0.29	0.25	-1.41	1.32	-0.26	0.47
0.73	-0.96	-1.38	-0.73	-1.17	-0.79	-1.02	1.53	-0.21
-1.52	0.97	0.69	0.07	0.08	0.34	-1.26	-1.34	-0.22
0.38	-0.76	1.17	-2.07	0.94	-0.07	1.71	2.44	1.45

ตารางที่ 3 ตัวแปรสุ่มของการกระจายปกติแบบมาตรฐาน

## Random digits

3513	2883	5675	8101	7526	2251	5765	4334	4112	5664
6976	882	2501	7066	9890	5741	5434	928	6666	1641
9847	4311	7238	4632	2642	4166	1213	9783	7778	8621
1722	2741	945	998	7480	5897	8665	5313	9289	7013
3874	2020	7257	5356	6822	2726	4055	5105	6567	2650
6793	6904	283	9564	4834	2927	4052	7966	1325	6253
5587	7242	3170	3843	4524	2555	4612	4678	6555	7228
4368	1157	7628	5352	3463	2608	4477	3327	25	9661
7740	9490	7272	8223	3880	9328	962	1810	2252	7136
2544	1043	3355	742	4256	8859	4846	9342	2434	526
1247	2749	5269	6867	3781	884	1270	9660	6531	2243
4679	7881	5173	108	4089	3558	4543	5234	515	5086
1275	3774	1169	3049	7772	9190	5186	8405	3757	6896
7556	3275	1644	384	7509	1596	1993	7590	7600	7283
5297	6238	9747	2344	6337	6919	4481	4618	7370	2662
9636	3854	6403	3730	4748	4918	6778	6404	7413	6846
4353	4503	7840	6510	8497	2388	7857	5648	3172	8196
627	9998	4341	6063	7311	9291	9951	6083	6935	6861
8749	743	5716	7602	4171	6603	2080	3047	9563	9952
3644	2297	979	5202	2397	7564	3808	4767	4330	3075
9475	9175	9776	6077	8476	6164	698	8712	5988	7513
1186	9497	6306	2359	7398	3158	2361	5744	3214	7581
6565	1153	7834	6623	9231	5779	1589	7522	829	7277
6196	1679	4311	753	5720	7541	3767	4733	4491	4348
5667	4871	8221	5485	8918	4139	4576	199	7	8252
9448	2418	9474	5075	5187	5440	5955	6771	7026	1217
4063	3423	3971	3013	2337	6903	382	162	7529	3713
4518	3687	1460	5569	276	1533	6711	6466	8391	2152
7392	4977	3333	5294	1228	537	2158	8113	9247	2466
1571	7234	9261	463	9424	2381	9463	5352	6938	3461
8226	8799	7860	7972	7086	769	838	8101	1064	3469
1237	6197	6048	517	8665	7335	6021	107	6454	7756
8451	900	9334	7905	3425	9400	5373	8834	2847	7572
9810	711	5972	9432	2847	2191	7518	5384	4643	9398
4602	3030	6755	3260	8760	3224	495	3958	9288	103
7028	1236	4165	3860	5677	9317	4807	4992	6684	5176
896	8789	4673	8931	1532	8808	9060	5086	3975	8075
7677	3382	1204	6779	9839	8019	9561	5185	5121	3969
7719	594	4086	9168	8233	6885	7211	1301	2909	5744
8276	7959	3268	7978	8449	8894	7320	3868	7327	9145
8928	1254	7176	1763	5995	98	6630	8902	3733	2282
92	15	9250	5397	9883	5916	3751	9260	1797	7443
8484	3912	7116	7486	873	7862	9314	5122	6901	5307
9730	611	6098	1085	1627	0	5353	2116	4353	8086
7810	4083	4207	8492	3085	2082	4723	9596	5065	4023

ภาคผนวก ข.

โปรแกรมจำลองแบบ



```

0001      COMMON/G1/ARR(2000,8),SV(2000,7),ICUS(2000,7),WT(2000,7)
0002      COMMON/G2/NOST(7),CSV(7),CWT(7),BG(7),AT(7,10)
0003      COMMON/G3/AMEAN(3),TMC(2),CLOCK,TIME,ICOUNT,NUM,IX,IY,JST
0004      10 READ(1,100,END=99)AMEAN,TMC,NOST,TIME,NUM,JST
0005      100 FORMAT(5F8.2,7I2,F8.2,14,I1)
0006      IX=492186
0007      CALL SETZ
0008      X=0.
0009      CALL ARR(X)
0010      CALL SERV
0011      DO 20 J=1,JST
0012      CALL COMP(J)
0013      IF(J.EQ.JST) GO TO 20
0014      CALL SEQE(J)
0015      20 CONTINUE
0016      CALL PRNT
0017      IF(X.EQ.1.) GO TO 30
0018      WRITE(3,200)
0019      200 FORMAT('SIMULATION WAS COMPLETED BY THE ASSIGNED TIME')
0020      GO TO 10
0021      30 WRITE(3,300)
0022      300 FORMAT('SIMULATION WAS COMPLETED ',
0023      'BY THE ASSIGNED CUSTOMER NUMBER')
0024      GO TO 10
0025      99 STOP
0026      END
    
```

```
0001      SUBROUTINE SETZ
0002      COMMON/G1/ARR(2000,8),SV(2000,7),ICUS(2000,7),WT(2000,7)
0003      COMMON/G2/NIST(7),CSV(7),CWT(7),BG(7),AT(7,10),AFX(3)
0004      COMMON/G3/AMEAN(3),TMC(2),CLOCK,TIME,ICOUNT,NU4,IX,IY,JST
0005      DO 10 I=1,JST
0006      C SV(I)=0.
0007      CWT(I)=0.
0008      BG(I)=0.
0009      DO 20 II=1,10
0010      AT(II,I)=0.
0011      20 CONTINUE
0012      10 CONTINUE
0013      DO 40 III=1,2000
0014      DO 30 IV=1,JST
0015      ARR(III,IV)=0.
0016      SV(III,IV)=0.
0017      ICUS(III,IV)=0
0018      WT(III,IV)=0.
0019      30 CONTINUE
0020      ARR(III,JST+1)=0.
0021      40 CONTINUE
0022      CLOCK=0.
0023      ICOUNT=1
0024      AFX(1)=0.
0025      AFX(2)=0.
0026      AFX(3)=0.
0027      IY=0
0028      RETURN
0029      END
```

```
0001      SUBROUTINE ARRV(X)
0002      COMMON/G1/ARR(2000,8),SV(2000,7),ICUS(2000,7),WT(2000,7)
0003      COMMON/G2/NOST(7),CSV(7),CWT(7),BG(7),AT(7,10),AFX(3)
0004      COMMON/G3/AMEAN(3),TMC(2),CLOCK,TIME,ICOUNT,NUM,IX,IY
0005      DIMENSION CFX(3),TOT(3)
0006      DO 5 IM=1,3
0007      CFX(IM)=0.
0008      TOT(IM)=0.
0009      5 CONTINUE
0010      ICUS(1,1)=1
0011      DO 40 I=2,NUM
0012      IF(CLOCK.GE.TIME) GO TO 50
0013      IF(CLOCK.GT.TMC(2)) GO TO 20
0014      IF(CLOCK.GT.TMC(1)) GO TO 10
0015      CALL EXPO(AMEAN(1),FX)
0016      CFX(1)=CFX(1)+FX
0017      TOT(1)=TOT(1)+1.
0018      GO TO 30
0019      10 CALL EXPO(AMEAN(2),FX)
0020      CFX(2)=CFX(2)+FX
0021      TOT(2)=TOT(2)+1.
0022      GO TO 30
0023      20 CALL EXPO(AMEAN(3),FX)
0024      CFX(3)=CFX(3)+FX
0025      TOT(3)=TOT(3)+1.
0026      30 ARR(1,1)=CLOCK+FX
0027      ICUS(1,1)=I
0028      ICOUNT=ICOUNT+1
0029      CLOCK=ARR(1,1)
0030      40 CONTINUE
0031      X=1.
0032      50 AFX(1)=CFX(1)/TOT(1)
0033      AFX(2)=CFX(2)/TOT(2)
0034      AFX(3)=CFX(3)/TOT(3)
0035      RETURN
0036      END
```

```
0001      SUBROUTINE COMP (J)
0002      COMMON/G1/ARR(2000,8),SV(2000,7),ICUS(2000,7),WT(2000,7)
0003      COMMON/G2/NOST(7),CSV(7),CWT(7),RG(7),AT(7,10)
0004      COMMON/G3/AMEAN(3),TMC(2),CLOCK,TIME,ICOUNT,NUM,IX,IY
0005      DO 40 I=1,ICOUNT
0006      B=1000000000.
0007      NC=ICUS(I,J)
0008      IF(SV(NC,J).EQ.0.) GO TO 40
0009      NO=NOST(J)
0010      DO 10 K=1,NO
0011      A=AT(J,K)-ARR(NC,J)
0012      IF(B.LE.A) GO TO 10
0013      B=A
0014      N=K
0015      10 CONTINUE
0016      IF(B.LE.0.) GO TO 20
0017      ARR(NC,J+1)=ARR(NC,J)+SV(NC,J)+B
0018      CWT(J)=CWT(J)+B
0019      GO TO 30
0020      20 ARR(NC,J+1)=ARR(NC,J)+SV(NC,J)
0021      30 WT(NC,J)=B
0022      IF(AT(J,N).EQ.0.) BG(J)=BG(J)+ARR(NC,J)
0023      AT(J,N)=ARR(NC,J+1)
0024      40 CONTINUE
0025      RETURN
0026      END
```

```
0001      SUBROUTINE SEQE (J)
0002      COMMON/G1/ARR(2000,8),SVI(2000,7),ICUS(2000,7),WT(2000,7)
0003      COMMON/G2/NOST(7),CSV(7),CWT(7),BG(7),AT(7,10)
0004      COMMON/G3/AMEAN(3),TMC(2),CLOCK,TIME,ICOUNT,NUM,IX,IY
0005      JJ=J+1
0006      ICUS(1, JJ)=ICUS(1, J)
0007      I1=ICOUNT-1
0008      DO 40 I=1, I1
0009          M=0
0010          ICUS(I+1, JJ)=ICUS(I+1, J)
0011          IF(ARR(ICUS(I+1, JJ), JJ).GE.ARR(ICUS(I, JJ), JJ)) GO TO 40
0012      10 M=M+1
0013          IF(M.EQ.1) GO TO 20
0014          IF(ARR(ICUS(I+1, JJ), JJ).GE.ARR(ICUS(I-M, JJ), JJ)) GO TO 20
0015          GO TO 10
0016      20 K1=ICUS(I+1, JJ)
0017          DO 30 K2=1, M
0018          ICUS(I-K2+2, JJ)=ICUS(I-K2+1, JJ)
0019      30 CONTINUE
0020          ICUS(I-M+1, JJ)=K1
0021      40 CONTINUE
0022      50 RETURN
0023      END
```

```
0001      SUBROUTINE SERV
0002      COMMON/G1/ARR(2000,8),SV(2000,7),ICOUNT(2000,7),WT(2000,7)
0003      COMMON/G2/NOST(7),CSV(7),CWT(7),RG(7),AT(7,10)
0004      COMMON/G3/AMEAN(3),TMC(2),CLOCK,TIME,ICOUNT,NUM,IX,IY
0005      DO 10 I=1,ICOUNT
0006          CALL SERV1(I)
0007          CALL SERV2(I)
0008          CALL SERV3(I)
0009          CALL SERV4(I)
0010          CALL SERV5(I)
0011          CALL SERV6(I)
0012          CALL SERV7(I)
0013          CSV(1)=CSV(1)+SV(I,1)
0014          CSV(2)=CSV(2)+SV(I,2)
0015          CSV(3)=CSV(3)+SV(I,3)
0016          CSV(4)=CSV(4)+SV(I,4)
0017          CSV(5)=CSV(5)+SV(I,5)
0018          CSV(6)=CSV(6)+SV(I,6)
0019          CSV(7)=CSV(7)+SV(I,7)
0020      10 CONTINUE
0021      RETURN
0022      END
```

```
0001      SUBROUTINE EXPO (X,FX)
0002      COMMON/G1/ARR(2000,8),SV(2000,7),ICUS(2000,7),W1(2000,7)
0003      COMMON/G2/NUS1(7),CSV(7),CWT(7),BG(7),AT(7,10)
0004      COMMON/G3/AMEAN(3),TMC(2),CLOCK,TIME,ICOUNT,NUM,IX,IY
0005      CALL RNDOM(RN)
0006      FX=(-X)+ALOG(RN)
0007      RETURN
0008      END
```

```
0001      SUBROUTINE RNDOM(RN)
0002      COMMON/G1/ARR(2000,8),SV(2000,7),ICUS(2000,7),WT(2000,7)
0003      COMMON/G2/NDS1(7),CSV(7),CWT(7),RG(7),AT(7,10)
0004      COMMON/G3/AMEAN(3),TMC(2),CLOCK,TIME,ICOUNT,NUM,IX,IY
0005      IY=IX*1220703125
0006      IF ((IY)1,2,2
0007      1 IY=IY+2147483647+1
0008      2 RN=IY
0009      RN=RN*0.4656613E-9
0010      IX=IY
0011      RETURN
0012      END
```



```

0001      SUBROUTINE PRNT
0002      COMMON/G1/ARR(2000,8),SV(2000,7),ICHS(2000,7),WT(2000,7)
0003      COMMON/G2/NDOS(7),CSV(7),CWT(7),SG(7),AT(7,10),AFX(3)
0004      COMMON/G3//MEAN(3),TMC(2),CLOCK,TIME,ICOUNT,NUM,IX,IY,JST
0005      DIMENSION II(7)
0006      100 FORMAT('L')
0007      110 FORMAT(' ARRIVAL AND DEPARTURE TIME REPORT',T100,'PAGE',13,/)
0008      120 FORMAT(' CUSTOMER',15X,7('STATION ',11,3X))
0009      125 FORMAT('+',T113,'TOTAL')
0010      130 FORMAT(2X,15,5X,'ARRIVAL',2X,7(3X,F9.2))
0011      140 FORMAT(12X,'DEPARTURE',7(3X,F9.2))
0012      150 FORMAT(' SERVICE AND WAITING TIME REPORT',T100,'PAGE',13,/)
0013      160 FORMAT('SUMMARY REPORT',/)
0014      170 FORMAT(2X,15,5X,'SERVICE',2X,7(3X,F9.2))
0015      180 FORMAT(12X,'WAITING',2X,7(3X,F9.2))
0016      190 FORMAT(12X,'TOTAL',4X,7(3X,F9.2))
0017      195 FORMAT('+',T105,F9.2,/)
0018      200 FORMAT(' AVERAGE WAITING TIME AT STATION ',11,3X,F9.2)
0019      210 FORMAT(' UTILIZATION OF STATION ',11,3X,F9.2)
0020      220 FORMAT(' AVERAGE SERVICE TIME AT STATION ',11,3X,F9.2)
0021      230 FORMAT(' AVERAGE TIME SPENT IN SYSTEM ',3X,F9.2)
0022      240 FORMAT(' AVERAGE WAITING TIME IN SYSTEM ',3X,F9.2)
0023      250 FORMAT('0')
0024      255 FORMAT(' ')
0025      260 FORMAT(' AVERAGE INTERARRIVAL TIME OF PERIOD ',11,3X,F9.2)
0026      270 FORMAT(' NUMBER OF SERVER AT STATION ',11,6X,12)
0027      COUNT=ICOUNT
0028      DO 5 NH=1,JST
0029      H(NH)=0.
0030      5 CONTINUE
0031      NP=0
0032      II=17
0033      DO 20 I=1,ICOUNT
0034      IF(II.LE.16) GO TO 10
0035      II=0
0036      NP=NP+1
0037      WRITE(3,100)
0038      WRITE(3,110)NP
0039      WRITE(3,120)(J,J=1,7)
0040      WRITE(3,250)
0041      10 WRITE(3,130)I,(ARR(I,J),J=1,JST)
0042      JJ=JST+1
0043      WRITE(3,140)(ARR(I,J),J=2,JJ)
0044      WRITE(3,255)
0045      II=II+1
0046      20 CONTINUE
0047      NP=0
0048      II=13
0049      CH1=0.
0050      DO 65 K=1,ICOUNT
0051      IF(II.LE.12) GO TO 30
0052      JJ=0
0053      NP=NP+1
0054      WRITE(3,100)

```

```

0055      WRITE(3,150)NP
0056      WRITE(3,120)(J,J=1,7)
0057      WRITE(3,125)
0058      WRITE(3,250)
0059      30 WRITE(3,170)K,(SV(K,J),J=1,JST)
0060      WRITE(3,180)(WT(K,J),J=1,JST)
0061      CH=0.
0062      DO 60 KK=1,JST
0063      IF(WT(K,KK).GT.0.) GO TO 40
0064      H(KK)=SV(K,KK)
0065      GO TO 50
0066      40 H(KK)=SV(K,KK)+WT(K,KK)
0067      50 CH=CH+H(KK)
0068      60 CONTINUE
0069      CHI=CHI+CH
0070      WRITE(3,190)(HI(J),J=1,JST)
0071      WRITE(3,195)CH
0072      II=II+1
0073      65 CONTINUE
0074      WRITE(3,160)
0075      WRITE(3,260)(N1,AFX(N1),N1=1,3)
0076      WRITE(3,250)
0077      WRITE(3,270)(N2,NOST(N2),N2=1,JST)
0078      WRITE(3,250)
0079      DO 90 LL=1,JST
0080      ASV=CSV(LL)/COUNT
0081      WRITE(3,220) LL,ASV
0082      90 CONTINUE
0083      WRITE(3,250)
0084      CCWT=0.
0085      DO 70 LL=1,JST
0086      AWT=CWT(LL)/COUNT
0087      CCWT=CCWT+CWT(LL)
0088      WRITE(3,200)LL,AWT
0089      70 CONTINUE
0090      WRITE(3,250)
0091      DO 80 LL=1,JST
0092      A=0.
0093      NO=NOST(LL)
0094      DO 75 L=1,NO
0095      A=A+AT(LL,L)
0096      75 CONTINUE
0097      AIT=CSV(LL)/(A-BG(LL))
0098      WRITE(3,210)LL,AIT
0099      80 CONTINUE
0100      AWT5=CCWT/COUNT
0101      WRITE(3,250)
0102      WRITE(3,240)AWT5
0103      ATS=CHI/COUNT
0104      WRITE(3,250)
0105      WRITE(3,230)ATS
0106      RETURN
0107      END

```

```

0001      SUBROUTINE SEFV1(M)
0002      COMMON/GE/APR12 COC, R1, SV(2000,7), IC'IS(2300,7), 41(2000,7)
0003      CALL RINDM(RN)
0004      IF(RN.LE.0.2983) GO TO 1
0005      IF(RN.LE.0.6101) GO TO 2
0006      IF(RN.LE.0.7728) GO TO 3
0007      IF(RN.LE.0.8590) GO TO 4
0008      IF(RN.LE.0.9063) GO TO 5
0009      IF(RN.LE.0.9332) GO TO 6
0010      IF(RN.LE.0.9497) GO TO 7
0011      IF(RN.LE.0.9611) GO TO 8
0012      IF(RN.LE.0.9730) GO TO 9
0013      IF(RN.LE.0.9814) GO TO 10
0014      IF(RN.LE.0.9854) GO TO 11
0015      IF(RN.LE.0.9935) GO TO 12
0016      IF(RN.LE.0.9916) GO TO 13
0017      IF(RN.LE.0.9925) GO TO 14
0018      IF(RN.LE.0.9943) GO TO 15
0019      IF(RN.LE.0.9965) GO TO 16
0020      IF(RN.LE.0.9982) GO TO 17
0021      IF(RN.LE.0.9987) GO TO 18
0022      19 SV(M,1)=07.5
0023      GO TO 99
0024      1 SV(M,1)=2.5
0025      GO TO 99
0026      2 SV(M,1)=7.5
0027      GO TO 99
0028      3 SV(M,1)=12.5
0029      GO TO 99
0030      4 SV(M,1)=17.5
0031      GO TO 99
0032      5 SV(M,1)=22.5
0033      GO TO 99
0034      6 SV(M,1)=27.5
0035      GO TO 99
0036      7 SV(M,1)=32.5
0037      GO TO 99
0038      8 SV(M,1)=37.5
0039      GO TO 99
0040      9 SV(M,1)=42.5
0041      GO TO 99
0042      10 SV(M,1)=47.5
0043      GO TO 99
0044      11 SV(M,1)=52.5
0045      GO TO 99
0046      12 SV(M,1)=57.5
0047      GO TO 99
0048      13 SV(M,1)=62.5
0049      GO TO 99
0050      14 SV(M,1)=67.5
0051      GO TO 99
0052      15 SV(M,1)=72.5
0053      GO TO 99
0054      16 SV(M,1)=77.5

```

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SERV1

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```
0055      GO TO 99
0056      17 SV(M,1)=85.0
0057      GO TO 99
0058      18 SV(M,1)=92.5
0059      99 RETURN
0060      END
```

```
0001      SUBROUTINE SERV2(M)
0002      COMMON/G1/FARR(2000,8),SV(2000,7),ICUS(2000,7),NT(2000,7)
0003      CALL RINDOM(RN)
0004      IF(RN.LE.0.0642) GO TO 1
0005      IF(RN.LE.0.3853) GO TO 2
0006      IF(RN.LE.0.6575) GO TO 3
0007      IF(RN.LE.0.8471) GO TO 4
0008      IF(RN.LE.0.8991) GO TO 5
0009      IF(RN.LE.0.9415) GO TO 6
0010      IF(RN.LE.0.9632) GO TO 7
0011      IF(RN.LE.0.9817) GO TO 8
0012      IF(RN.LE.0.9945) GO TO 9
0013      SV(M,2)=47.5
0014      GO TO 99
0015      1 SV(M,2)=2.5
0016      GO TO 99
0017      2 SV(M,2)=7.5
0018      GO TO 99
0019      3 SV(M,2)=12.5
0020      GO TO 99
0021      4 SV(M,2)=17.5
0022      GO TO 99
0023      5 SV(M,2)=22.5
0024      GO TO 99
0025      6 SV(M,2)=27.5
0026      GO TO 99
0027      7 SV(M,2)=32.5
0028      GO TO 99
0029      8 SV(M,2)=37.5
0030      GO TO 99
0031      9 SV(M,2)=42.5
0032      99 SV(M,2)=SV(M,2)+2.5
0033      RETURN
0034      END
```

```
0001      SUBROUTINE SERV3(M)
0002      COMMON/G1/ARR(2000,8),SV(2000,7),ICUS(2000,7),41(2000,7)
0003      CALL R1NDOM(PN)
0004      IF(RN.LE.0.1216) GO TO 1
0005      IF(RN.LE.0.5360) GO TO 2
0006      IF(RN.LE.0.8055) GO TO 3
0007      IF(RN.LE.0.9210) GO TO 4
0008      IF(RN.LE.0.9666) GO TO 5
0009      IF(RN.LE.0.9939) GO TO 6
0010      SV(M,3)=37.5
0011      GO TO 99
0012      1 SV(M,3)=7.5
0013      GO TO 99
0014      2 SV(M,3)=12.5
0015      GO TO 99
0016      3 SV(M,3)=17.5
0017      GO TO 99
0018      4 SV(M,3)=22.5
0019      GO TO 99
0020      5 SV(M,3)=27.5
0021      GO TO 99
0022      6 SV(M,3)=32.5
0023      99 RETURN
0024      END
```

```

0001      SUPROUTINE SERV4(M)
0002      COMMON/G1/PARR(2000,R),SV(2000,7),ICUS(2000,7),WII(2000,7)
0003      CALL ROUNDM(RA)
0004      IF(RN.LE.0.0016) GO TO 1
0005      IF(RN.LE.0.0175) GO TO 2
0006      IF(RN.LE.0.0836) GO TO 3
0007      IF(RN.LE.0.1916) GO TO 4
0008      IF(RN.LE.0.3336) GO TO 5
0009      IF(RN.LE.0.4706) GO TO 6
0010      IF(RN.LE.0.5771) GO TO 7
0011      IF(RN.LE.0.6705) GO TO 8
0012      IF(RN.LE.0.7581) GO TO 9
0013      IF(RN.LE.0.8239) GO TO 10
0014      IF(RN.LE.0.8742) GO TO 11
0015      IF(RN.LE.0.9123) GO TO 12
0016      IF(RN.LE.0.9481) GO TO 13
0017      IF(RN.LE.0.9675) GO TO 14
0018      IF(RN.LE.0.9841) GO TO 15
0019      IF(RN.LE.0.9911) GO TO 16
0020      IF(RN.LE.0.9927) GO TO 17
0021      IF(RN.LE.0.9955) GO TO 18
0022      IF(RN.LE.0.9984) GO TO 19
0023      SV(M,4)=97.5
0024      GO TO 99
0025      1 SV(M,4)=2.5
0026      GO TO 99
0027      2 SV(M,4)=7.5
0028      GO TO 99
0029      3 SV(M,4)=12.5
0030      GO TO 99
0031      4 SV(M,4)=17.5
0032      GO TO 99
0033      5 SV(M,4)=22.5
0034      GO TO 99
0035      6 SV(M,4)=27.5
0036      GO TO 99
0037      7 SV(M,4)=32.5
0038      GO TO 99
0039      8 SV(M,4)=37.5
0040      GO TO 99
0041      9 SV(M,4)=42.5
0042      GO TO 99
0043      10 SV(M,4)=47.5
0044      GO TO 99
0045      11 SV(M,4)=52.5
0046      GO TO 99
0047      12 SV(M,4)=57.5
0048      GO TO 99
0049      13 SV(M,4)=62.5
0050      GO TO 99
0051      14 SV(M,4)=67.5
0052      GO TO 99
0053      15 SV(M,4)=72.5
0054      GO TO 99

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0055      16 SV(M,4)=77.5
0056      GO TO 99
0057      17 SV(M,4)=82.5
0058      GO TO 90
0059      18 SV(M,4)=87.5
0060      GO TO 90
0061      19 SV(M,4)=92.5
0062      99 RETURN
0063      END
```



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0001      SUBROUTINE SERV5(M)
0002      COMMON/G1/ARK(2000,8),SV(2000,7),ICUS(2000,7),WT(2000,7)
0003      CALL RNDOM(RN)
0004      IF(RN.LE.0.0006) GO TO 1
0005      IF(RN.LE.0.0170) GO TO 2
0006      IF(RN.LE.0.0754) GO TO 3
0007      IF(RN.LE.0.1550) GO TO 4
0008      IF(RN.LE.0.2483) GO TO 5
0009      IF(RN.LE.0.3601) GO TO 6
0010      IF(RN.LE.0.4565) GO TO 7
0011      IF(RN.LE.0.5455) GO TO 8
0012      IF(RN.LE.0.6191) GO TO 9
0013      IF(RN.LE.0.6885) GO TO 10
0014      IF(RN.LE.0.7402) GO TO 11
0015      IF(RN.LE.0.7949) GO TO 12
0016      IF(RN.LE.0.8218) GO TO 13
0017      IF(RN.LE.0.8665) GO TO 14
0018      IF(RN.LE.0.8975) GO TO 15
0019      IF(RN.LE.0.9214) GO TO 16
0020      IF(RN.LE.0.9425) GO TO 17
0021      IF(RN.LE.0.9591) GO TO 18
0022      IF(RN.LE.0.9684) GO TO 19
0023      IF(RN.LE.0.9784) GO TO 20
0024      IF(RN.LE.0.9830) GO TO 21
0025      IF(RN.LE.0.9864) GO TO 22
0026      IF(RN.LE.0.9900) GO TO 23
0027      IF(RN.LE.0.9907) GO TO 24
0028      IF(RN.LE.0.9938) GO TO 25
0029      IF(RN.LE.0.9945) GO TO 26
0030      IF(RN.LE.0.9965) GO TO 27
0031      SV(M,5)=137.5
0032      GO TO 99
0033      1 SV(M,5)=2.5
0034      GO TO 99
0035      2 SV(M,5)=7.5
0036      GO TO 99
0037      3 SV(M,5)=12.5
0038      GO TO 99
0039      4 SV(M,5)=17.5
0040      GO TO 99
0041      5 SV(M,5)=22.5
0042      GO TO 99
0043      6 SV(M,5)=27.5
0044      GO TO 99
0045      7 SV(M,5)=32.5
0046      GO TO 99
0047      8 SV(M,5)=37.5
0048      GO TO 99
0049      9 SV(M,5)=42.5
0050      GO TO 99
0051      10 SV(M,5)=47.5
0052      GO TO 99
0053      11 SV(M,5)=52.5
0054      GO TO 99

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0055      12  SV(M,5)=57.5
0056          GO TO 99
0057      13  SV(M,5)=62.5
0058          GO TO 99
0059      14  SV(M,5)=67.5
0060          GO TO 99
0061      15  SV(M,5)=72.5
0062          GO TO 99
0063      16  SV(M,5)=77.5
0064          GO TO 99
0065      17  SV(M,5)=82.5
0066          GO TO 99
0067      18  SV(M,5)=87.5
0068          GO TO 99
0069      19  SV(M,5)=92.5
0070          GO TO 99
0071      20  SV(M,5)=97.5
0072          GO TO 99
0073      21  SV(M,5)=102.5
0074          GO TO 99
0075      22  SV(M,5)=107.5
0076          GO TO 99
0077      23  SV(M,5)=112.5
0078          GO TO 99
0079      24  SV(M,5)=117.5
0080          GO TO 99
0081      25  SV(M,5)=122.5
0082          GO TO 99
0083      26  SV(M,5)=127.5
0084          GO TO 99
0085      27  SV(M,5)=132.5
0086      99  SV(M,5)=SV(M,5)+3.5
0087          RETURN
0088          END
```

```

0001      SUBROUTINE SERV6(M)
0002      COMMON/G1/ARR(1000,4),SV(2000,7),ICHS(2000,7),WT(2000,7)
0003      CALL RNDUM(RN)
0004      IF(RN.LE.0.0251) GO TO 1
0005      IF(RN.LE.0.1301) GO TO 2
0006      IF(RN.LE.0.2472) GO TO 3
0007      IF(RN.LE.0.3765) GO TO 4
0008      IF(RN.LE.0.5014) GO TO 5
0009      IF(RN.LE.0.5089) GO TO 6
0010      IF(RN.LE.0.6741) GO TO 7
0011      IF(RN.LE.0.7341) GO TO 8
0012      IF(RN.LE.0.7905) GO TO 9
0013      IF(RN.LE.0.8380) GO TO 10
0014      IF(RN.LE.0.8855) GO TO 11
0015      IF(RN.LE.0.8994) GO TO 12
0016      IF(RN.LE.0.9218) GO TO 13
0017      IF(RN.LE.0.9435) GO TO 14
0018      IF(RN.LE.0.9591) GO TO 15
0019      IF(RN.LE.0.9637) GO TO 16
0020      IF(RN.LE.0.9735) GO TO 17
0021      IF(RN.LE.0.9888) GO TO 18
0022      IF(RN.LE.0.9944) GO TO 19
0023      SV(M,6)=97.5
0024      GO TO 99
0025      1 SV(M,6)=2.5
0026      GO TO 99
0027      2 SV(M,6)=7.5
0028      GO TO 99
0029      3 SV(M,6)=12.5
0030      GO TO 99
0031      4 SV(M,6)=17.5
0032      GO TO 99
0033      5 SV(M,6)=22.5
0034      GO TO 99
0035      6 SV(M,6)=27.5
0036      GO TO 99
0037      7 SV(M,6)=32.5
0038      GO TO 99
0039      8 SV(M,6)=37.5
0040      GO TO 99
0041      9 SV(M,6)=42.5
0042      GO TO 99
0043      10 SV(M,6)=47.5
0044      GO TO 99
0045      11 SV(M,6)=52.5
0046      GO TO 99
0047      12 SV(M,6)=57.5
0048      GO TO 99
0049      13 SV(M,6)=62.5
0050      GO TO 99
0051      14 SV(M,6)=67.5
0052      GO TO 99
0053      15 SV(M,6)=72.5
0054      GO TO 99

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DOS FORTRAN IV 360N-F0-479 3-8

SERV6

DATE 12/03/82

TIME

20.56.52

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0055      16 SV(M,6)=77.5
0056      GO TO 99
0057      17 SV(M,6)=82.5
0058      GO TO 99
0059      18 SV(M,6)=87.5
0060      GO TO 99
0061      19 SV(M,6)=92.5
0062      99 SV(M,6)=SV(M,6)+3.5
0063      RETURN
0064      END
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0001      SUBROUTINE SERV7(M)  
0002      COMMON/G1/RR(2000,8),SV(2000,7),ICHS(2000,7),A1(2000,7)  
0003      SV(M,7)=7.5  
0004      99 RETURN  
0005      END
```

ภาคผนวก ค.

ตัวอย่างรายงานผลการจำลองแบบ



ตัวอย่างที่ 1

รายงานต่าง ๆ ของผลการจำลองแบบของระบบจ่ายยาที่มีขั้นตอนทั้งหมด 7 สถานี

## ARRIVAL AND DEPARTURE TIME REPORT

PAGE 1

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7
1	ARRIVAL	0.0	2.50	17.50	50.00	72.50	123.50	154.50
	DEPARTURE	2.50	17.50	50.00	72.50	123.50	154.50	162.00
2	ARRIVAL	5.36	12.86	27.86	72.50	120.00	156.00	177.00
	DEPARTURE	12.86	27.86	72.50	120.00	156.00	177.00	184.50
3	ARRIVAL	9.60	15.36	32.50	70.00	167.50	203.50	254.50
	DEPARTURE	15.36	32.50	90.00	167.50	203.50	254.50	262.00
4	ARRIVAL	30.09	52.59	67.59	102.59	157.50	233.50	254.50
	DEPARTURE	52.59	67.59	102.50	157.50	233.50	254.50	269.50
5	ARRIVAL	35.79	60.09	80.09	115.09	195.00	249.50	270.50
	DEPARTURE	60.09	80.09	115.00	115.00	249.50	270.50	278.00
6	ARRIVAL	46.11	72.59	82.59	127.50	195.00	249.50	275.50
	DEPARTURE	72.59	82.59	127.50	115.00	249.50	275.50	285.50
7	ARRIVAL	46.70	100.09	170.09	147.00	217.50	265.50	356.50
	DEPARTURE	100.09	120.09	140.00	217.50	265.50	356.50	364.00
8	ARRIVAL	47.49	112.59	132.59	152.59	217.50	300.50	333.50
	DEPARTURE	112.59	132.59	157.50	217.50	300.50	333.50	341.00
9	ARRIVAL	57.93	120.09	135.09	170.00	225.00	296.50	322.50
	DEPARTURE	120.09	135.09	170.00	225.00	296.50	322.50	330.00
10	ARRIVAL	64.01	142.59	162.59	177.50	225.00	342.50	392.50
	DEPARTURE	142.59	162.59	187.50	225.00	342.50	392.50	402.00
11	ARRIVAL	68.28	160.09	180.00	205.00	262.50	326.50	379.50
	DEPARTURE	160.09	180.00	205.00	262.50	326.50	379.50	387.00
12	ARRIVAL	71.42	192.59	227.59	250.00	292.59	377.50	408.50
	DEPARTURE	192.59	227.59	250.00	292.59	377.50	408.50	416.00
13	ARRIVAL	72.38	195.00	240.00	257.50	315.00	358.50	385.50
	DEPARTURE	195.00	240.00	257.50	315.00	358.50	385.50	394.50
14	ARRIVAL	74.02	212.59	247.59	255.00	325.09	374.50	446.50
	DEPARTURE	212.59	247.59	265.00	325.09	374.50	446.50	454.00
15	ARRIVAL	59.46	215.09	255.09	292.59	337.50	385.50	464.50
	DEPARTURE	215.09	255.09	292.59	317.50	385.50	464.50	472.00
16	ARRIVAL	105.83	227.59	257.59	300.00	392.59	418.59	502.50
	DEPARTURE	227.59	257.59	300.00	392.59	418.59	502.50	510.00
17	ARRIVAL	115.90	255.09	265.09	312.50	400.00	426.00	485.50
	DEPARTURE	255.09	265.09	312.59	400.00	426.00	485.50	493.00



## ARRIVAL AND DEPARTURE TIME REPORT

PAGE 2

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7
18	ARRIVAL	118.82	262.59	287.59	317.57	432.50	473.50	558.50
	DEPARTURE	262.59	287.59	317.57	432.50	473.50	558.50	566.00
19	ARRIVAL	120.03	265.09	275.07	325.07	410.09	444.59	526.50
	DEPARTURE	265.09	275.09	325.09	410.07	444.59	526.50	534.00
20	ARRIVAL	131.05	267.59	230.07	350.07	467.59	544.50	558.50
	DEPARTURE	267.59	290.09	350.07	467.57	544.50	558.50	573.50
21	ARRIVAL	139.73	275.09	312.59	362.59	465.00	526.00	547.50
	DEPARTURE	275.09	302.59	362.59	465.07	526.00	547.50	555.00
22	ARRIVAL	157.55	277.59	305.07	370.07	492.50	635.50	656.50
	DEPARTURE	277.59	305.09	370.09	472.57	635.50	656.50	664.00
23	ARRIVAL	191.08	280.09	317.59	392.59	470.09	612.00	623.00
	DEPARTURE	280.09	317.59	392.59	492.07	612.00	623.00	630.50
24	ARRIVAL	193.19	282.59	340.07	375.09	517.59	646.50	697.50
	DEPARTURE	282.59	340.09	395.09	517.57	646.50	697.50	705.00
25	ARRIVAL	194.46	300.09	347.57	417.57	515.00	703.00	729.00
	DEPARTURE	300.09	347.59	407.59	515.07	703.00	729.00	736.50
26	ARRIVAL	199.50	307.59	350.09	420.07	557.50	759.00	815.50
	DEPARTURE	307.59	350.09	420.09	557.50	759.00	815.50	826.50
27	ARRIVAL	199.98	310.09	367.59	437.57	555.09	717.50	813.50
	DEPARTURE	310.09	367.59	437.59	555.07	717.50	813.50	821.00
28	ARRIVAL	215.04	317.59	375.09	455.07	587.59	774.50	884.50
	DEPARTURE	317.59	375.09	455.07	517.57	774.50	884.50	892.00
29	ARRIVAL	217.68	320.09	392.59	472.59	585.00	733.50	789.50
	DEPARTURE	320.09	392.59	472.59	595.07	733.50	789.50	797.00
30	ARRIVAL	220.14	322.59	399.07	477.07	597.50	795.00	851.50
	DEPARTURE	322.59	399.09	499.09	577.57	795.00	851.50	859.00



## SERVICE AND WAITING TIME REPORT

PAGE 1

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7	TOTAL
1	SERVICE	2.50	15.00	32.50	22.50	51.00	31.00	7.50	
	WAITING	0.0	-2.50	-17.50	-57.00	-72.50	-123.50	-154.50	
	TOTAL	2.50	15.00	32.50	22.50	51.00	31.00	7.50	162.00
2	SERVICE	7.50	15.00	22.50	47.50	36.00	21.00	7.50	
	WAITING	-2.86	-12.86	22.14	-72.37	-120.00	-156.00	-15.00	
	TOTAL	7.50	15.00	44.64	47.50	36.00	21.00	7.50	179.14
3	SERVICE	2.50	15.00	17.50	77.50	36.00	51.00	7.50	
	WAITING	3.25	2.14	40.00	-17.50	-11.50	-49.00	-70.00	
	TOTAL	5.75	17.14	57.50	77.50	36.00	51.00	7.50	252.10
4	SERVICE	22.50	15.00	12.50	17.50	76.00	21.00	7.50	
	WAITING	-14.73	-24.73	22.41	17.50	-34.00	-56.50	7.50	
	TOTAL	22.50	15.00	34.91	55.00	76.00	21.00	15.00	237.41
5	SERVICE	7.50	20.00	12.50	27.50	46.00	16.00	7.50	
	WAITING	16.80	-27.59	22.41	42.50	18.50	5.00	-1.00	
	TOTAL	24.30	20.00	34.91	70.00	64.50	21.00	7.50	242.21
6	SERVICE	12.50	10.00	12.50	17.50	16.00	21.00	7.50	
	WAITING	13.98	-5.00	32.41	40.00	48.50	5.00	2.50	
	TOTAL	26.48	10.00	44.91	57.50	64.50	26.00	10.00	239.39
7	SERVICE	27.50	20.00	12.50	32.50	16.00	86.00	7.50	
	WAITING	25.89	-20.00	7.41	45.00	32.00	5.00	-15.50	
	TOTAL	53.39	20.00	19.91	77.50	48.00	91.00	7.50	317.30
8	SERVICE	12.50	20.00	12.50	32.50	51.00	11.00	7.50	
	WAITING	52.60	-30.00	7.50	32.50	32.00	22.00	-3.50	
	TOTAL	55.10	20.00	19.91	65.00	83.00	33.00	7.50	293.51
9	SERVICE	7.50	15.00	17.50	7.50	31.00	26.00	7.50	
	WAITING	54.66	0.0	17.41	47.50	40.50	-21.00	-37.00	
	TOTAL	62.16	15.00	34.91	55.00	71.50	26.00	7.50	272.07
10	SERVICE	22.50	20.00	17.50	7.50	46.00	36.00	7.50	
	WAITING	55.28	-10.00	7.41	10.00	71.50	14.00	2.00	
	TOTAL	77.78	20.00	24.91	17.50	117.50	50.00	9.50	337.19
11	SERVICE	17.50	20.00	17.50	17.50	26.00	46.00	7.50	
	WAITING	74.30	-25.00	7.41	20.00	30.00	7.00	-15.50	
	TOTAL	91.80	20.00	24.91	57.50	64.00	53.00	7.50	310.72
12	SERVICE	32.50	35.00	22.50	42.50	51.00	16.00	7.50	
	WAITING	88.67	-30.00	-22.50	-25.00	33.91	15.00	-6.50	
	TOTAL	121.17	35.00	22.50	42.50	84.91	31.00	7.50	344.58
13	SERVICE	2.50	45.00	7.50	52.50	16.00	6.00	7.50	
	WAITING	120.21	-15.00	10.00	4.91	27.50	21.00	1.50	
	TOTAL	122.71	45.00	17.50	57.41	43.50	27.00	9.00	322.12

## SERVICE AND WAITING TIME REPORT

PAGE 2

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7	TOTAL
14	SERVICE	17.50	20.00	7.50	32.50	16.00	61.00	7.50	
	WAITING	121.07	15.00	10.00	27.51	33.41	11.00	-30.50	
	TOTAL	138.57	35.00	17.50	60.01	49.41	72.00	7.50	379.73
15	SERVICE	2.50	15.00	17.50	22.50	11.00	56.00	7.50	
	WAITING	113.12	25.00	10.00	12.41	37.00	23.00	-10.50	
	TOTAL	115.62	40.00	27.50	34.91	48.00	79.00	7.50	372.54
16	SERVICE	12.50	10.00	17.50	57.50	26.00	56.00	7.50	
	WAITING	109.26	20.00	25.00	35.01	-15.09	27.91	-9.50	
	TOTAL	121.76	30.00	42.50	92.51	26.00	83.91	7.50	404.17
17	SERVICE	27.50	10.00	12.50	62.50	26.00	21.00	7.50	
	WAITING	111.69	0.0	35.00	24.71	-14.50	38.50	-13.50	
	TOTAL	139.19	10.00	47.50	87.21	26.00	59.50	7.50	377.10
18	SERVICE	7.50	25.00	12.50	12.50	41.00	56.00	7.50	
	WAITING	136.27	-5.00	17.50	52.41	-6.50	29.00	-3.50	
	TOTAL	143.77	25.00	30.00	64.91	41.00	85.00	7.50	447.19
19	SERVICE	2.50	10.00	12.50	17.50	26.00	41.00	7.50	
	WAITING	142.55	0.0	17.50	67.51	8.50	40.91	-16.50	
	TOTAL	145.05	10.00	30.00	85.01	34.50	81.91	7.50	413.97
20	SERVICE	2.50	15.00	12.50	57.50	71.00	11.00	7.50	
	WAITING	134.04	7.50	47.50	43.01	5.91	3.00	7.50	
	TOTAL	136.54	22.50	60.00	100.51	76.91	14.00	15.00	442.45
21	SERVICE	7.50	15.00	12.50	12.50	61.00	21.00	7.50	
	WAITING	127.86	12.50	47.50	67.71	-20.41	0.50	-13.50	
	TOTAL	135.36	27.50	60.00	80.21	51.00	21.50	7.50	415.27
22	SERVICE	2.50	15.00	7.50	27.50	91.00	21.00	7.50	
	WAITING	117.54	12.50	57.50	74.91	52.00	-77.00	-26.00	
	TOTAL	120.04	27.50	65.00	102.41	143.00	21.00	7.50	506.45
23	SERVICE	2.50	15.00	12.50	22.50	46.00	11.00	7.50	
	WAITING	86.51	22.50	52.50	15.01	15.71	-53.50	-49.50	
	TOTAL	89.01	37.50	65.00	37.51	61.71	11.00	7.50	439.42
24	SERVICE	2.50	35.00	12.50	27.50	11.00	51.00	7.50	
	WAITING	85.90	22.50	42.50	25.01	117.91	-23.50	-33.50	
	TOTAL	88.40	57.50	55.00	52.51	128.91	51.00	7.50	511.91
25	SERVICE	17.50	30.00	12.50	22.50	91.00	26.00	7.50	
	WAITING	88.12	17.50	47.50	95.71	97.00	-46.50	-24.00	
	TOTAL	105.62	47.50	60.00	118.21	188.00	26.00	7.50	542.04
26	SERVICE	7.50	10.00	12.50	42.50	56.00	26.00	7.50	
	WAITING	100.58	32.50	57.50	75.71	145.50	30.50	5.50	
	TOTAL	108.08	42.50	70.00	118.21	201.50	56.50	13.00	629.00



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## SERVICE AND WAITING TIME REPORT

PAGE 3

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7	TOTAL
27	SERVICE	2.50	20.00	17.50	17.50	71.00	96.00	7.50	
	WAITING	107.71	37.50	52.50	90.00	91.41	-20.00	-16.50	
	TOTAL	110.21	57.50	70.00	117.50	162.41	96.00	7.50	621.12
28	SERVICE	7.50	25.00	17.50	12.50	41.00	71.00	7.50	
	WAITING	95.05	32.50	52.50	100.00	145.91	39.00	-25.50	
	TOTAL	102.55	57.50	90.00	112.50	186.91	110.00	7.50	676.96
29	SERVICE	2.50	15.00	17.50	27.50	16.00	56.00	7.50	
	WAITING	99.91	47.50	72.50	94.91	132.50	-4.50	-53.00	
	TOTAL	102.41	62.50	90.00	112.41	148.50	56.00	7.50	579.32
30	SERVICE	7.50	15.00	17.50	17.50	36.00	36.00	7.50	
	WAITING	99.95	52.50	92.50	94.91	161.50	20.50	-23.00	
	TOTAL	102.45	67.50	100.00	107.41	197.50	56.50	7.50	638.86

SUMMARY REPORT

AVERAGE INTERARRIVAL TIME OF PERIOD 1      7.10  
 AVERAGE INTERARRIVAL TIME OF PERIOD 2      11.45  
 AVERAGE INTERARRIVAL TIME OF PERIOD 3      4.15

NUMBER OF SERVER AT STATION 1      1  
 NUMBER OF SERVER AT STATION 2      2  
 NUMBER OF SERVER AT STATION 3      1  
 NUMBER OF SERVER AT STATION 4      2  
 NUMBER OF SERVER AT STATION 5      2  
 NUMBER OF SERVER AT STATION 6      2  
 NUMBER OF SERVER AT STATION 7      1

AVERAGE SERVICE TIME AT STATION 1      10.17  
 AVERAGE SERVICE TIME AT STATION 2      18.83  
 AVERAGE SERVICE TIME AT STATION 3      15.00  
 AVERAGE SERVICE TIME AT STATION 4      34.00  
 AVERAGE SERVICE TIME AT STATION 5      42.50  
 AVERAGE SERVICE TIME AT STATION 6      36.83  
 AVERAGE SERVICE TIME AT STATION 7      7.50

AVERAGE WAITING TIME AT STATION 1      79.46  
 AVERAGE WAITING TIME AT STATION 2      11.09  
 AVERAGE WAITING TIME AT STATION 3      32.46  
 AVERAGE WAITING TIME AT STATION 4      48.80  
 AVERAGE WAITING TIME AT STATION 5      46.70  
 AVERAGE WAITING TIME AT STATION 6      11.93  
 AVERAGE WAITING TIME AT STATION 7      0.88

UTILIZATION OF STATION 1      0.55  
 UTILIZATION OF STATION 2      0.75  
 UTILIZATION OF STATION 3      0.95  
 UTILIZATION OF STATION 4      0.96  
 UTILIZATION OF STATION 5      0.93  
 UTILIZATION OF STATION 6      0.71  
 UTILIZATION OF STATION 7      0.31

AVERAGE WAITING TIME IN SYSTEM      232.42

AVERAGE TIME SPENT IN SYSTEM      297.25



ตัวอย่างที่ 2

รายงานต่าง ๆ ของผลการจำลองแบบของระบบจ่ายยาที่มีชั้นทอนทั้งหมด 5 สถานี

## ARRIVAL AND DEPARTURE TIME REPORT

PAGE 1

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7
1	ARRIVAL	0.0	2.50	17.50	49.00	72.50		
	DEPARTURE	2.50	17.50	50.00	72.50	123.50		
2	ARRIVAL	5.36	12.96	27.96	72.50	123.00		
	DEPARTURE	12.96	27.96	72.50	123.00	156.00		
3	ARRIVAL	9.60	15.36	32.50	72.00	167.50		
	DEPARTURE	15.36	32.50	92.00	167.50	203.50		
4	ARRIVAL	30.09	52.59	67.59	112.50	157.50		
	DEPARTURE	52.59	67.59	102.50	157.50	233.50		
5	ARRIVAL	35.79	60.09	80.09	115.00	185.00		
	DEPARTURE	60.09	80.09	115.00	185.00	249.50		
6	ARRIVAL	46.11	72.59	92.59	127.50	195.00		
	DEPARTURE	72.59	92.59	127.50	185.00	249.50		
7	ARRIVAL	46.70	100.09	120.09	140.00	217.50		
	DEPARTURE	100.09	120.09	140.00	217.50	265.50		
8	ARRIVAL	47.49	112.59	132.59	152.50	217.50		
	DEPARTURE	112.59	132.59	152.50	217.50	300.50		
9	ARRIVAL	57.93	120.09	135.09	170.00	225.00		
	DEPARTURE	120.09	135.09	170.00	225.00	296.50		
10	ARRIVAL	64.81	142.59	152.59	177.50	225.00		
	DEPARTURE	142.59	162.59	187.50	225.00	342.50		
11	ARRIVAL	68.28	160.09	190.09	235.00	262.50		
	DEPARTURE	160.09	190.09	205.00	262.50	326.50		
12	ARRIVAL	71.42	192.59	227.59	250.00	292.59		
	DEPARTURE	192.59	227.59	250.00	272.59	377.50		
13	ARRIVAL	72.38	195.09	240.09	277.50	315.00		
	DEPARTURE	195.09	240.09	257.59	315.00	358.50		
14	ARRIVAL	74.02	212.59	247.59	265.00	325.09		
	DEPARTURE	212.59	247.59	265.00	325.00	374.50		
15	ARRIVAL	89.46	215.09	255.09	292.50	337.50		
	DEPARTURE	215.09	255.09	292.59	317.50	395.50		
16	ARRIVAL	105.83	227.59	257.59	307.00	392.59		
	DEPARTURE	227.59	257.59	300.00	312.50	418.59		
17	ARRIVAL	115.90	255.09	265.09	312.50	400.00		
	DEPARTURE	255.09	265.09	312.59	407.00	426.00		

## ARRIVAL AND DEPARTURE TIME REPORT

PAGE 2

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7
18	ARRIVAL	110.02	262.59	297.57	317.57	432.50		
	DEPARTURE	262.59	297.59	317.59	412.51	473.50		
19	ARRIVAL	120.03	265.09	275.09	325.01	410.09		
	DEPARTURE	255.09	275.09	325.09	410.07	444.59		
20	ARRIVAL	131.05	267.59	290.09	350.07	467.59		
	DEPARTURE	267.59	290.09	350.09	457.59	544.50		
21	ARRIVAL	139.73	275.09	302.57	362.59	465.00		
	DEPARTURE	275.09	302.59	362.59	465.07	526.00		
22	ARRIVAL	157.55	277.59	305.09	377.07	492.50		
	DEPARTURE	277.59	305.09	370.09	472.57	615.50		
23	ARRIVAL	191.08	280.09	317.59	392.59	490.09		
	DEPARTURE	280.09	317.59	382.59	470.07	612.00		
24	ARRIVAL	193.19	282.59	340.09	395.07	517.59		
	DEPARTURE	282.59	340.09	395.09	517.59	646.50		
25	ARRIVAL	194.66	300.09	347.59	407.59	515.00		
	DEPARTURE	300.09	347.59	407.59	515.07	703.00		
26	ARRIVAL	199.50	307.59	350.19	420.07	557.50		
	DEPARTURE	307.59	350.09	420.09	557.59	759.00		
27	ARRIVAL	199.88	310.09	367.59	437.57	555.09		
	DEPARTURE	310.09	367.59	437.59	555.07	717.50		
28	ARRIVAL	215.04	317.59	375.09	455.07	587.59		
	DEPARTURE	317.59	375.09	455.09	517.59	774.50		
29	ARRIVAL	217.68	320.09	382.59	472.59	585.00		
	DEPARTURE	320.09	382.59	472.59	535.07	733.50		
30	ARRIVAL	220.14	322.59	390.09	477.07	597.50		
	DEPARTURE	322.59	390.09	490.09	597.59	795.00		





## SERVICE AND WAITING TIME REPORT

PAGE 1

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7	TOTAL
1	SERVICE	2.50	15.00	32.50	22.50	51.00			123.50
	WAITING	0.0	-2.50	-17.50	-50.00	-72.50			
	TOTAL	2.50	15.00	32.50	22.50	51.00			
2	SERVICE	7.50	15.00	32.50	47.50	36.00			150.54
	WAITING	-2.86	-12.86	22.14	-72.50	-120.00			
	TOTAL	7.50	15.00	44.54	47.50	36.00			
3	SERVICE	2.50	15.00	17.50	77.50	36.00			193.70
	WAITING	3.25	2.14	40.00	-17.50	-11.50			
	TOTAL	5.75	17.14	57.50	77.50	36.00			
4	SERVICE	22.50	15.00	12.50	37.50	76.00			203.41
	WAITING	-14.73	-24.73	22.41	17.50	-34.00			
	TOTAL	22.50	15.00	34.91	55.00	76.00			
5	SERVICE	7.50	20.00	12.50	27.50	46.00			213.71
	WAITING	16.80	-27.59	22.41	42.50	18.50			
	TOTAL	24.30	20.00	34.91	70.00	64.50			
6	SERVICE	12.50	10.00	12.50	17.50	16.00			223.39
	WAITING	13.98	-5.00	32.41	40.00	48.50			
	TOTAL	26.48	10.00	44.91	57.50	64.50			
7	SERVICE	27.50	20.00	12.50	32.50	16.00			218.30
	WAITING	25.89	-20.00	7.41	45.00	32.00			
	TOTAL	53.39	20.00	19.91	77.50	48.00			
8	SERVICE	12.50	20.00	12.50	12.50	51.00			252.01
	WAITING	52.60	-30.00	7.41	32.50	32.00			
	TOTAL	55.10	20.00	19.91	55.00	93.00			
9	SERVICE	7.50	15.00	17.50	7.50	31.00			238.57
	WAITING	54.56	0.0	17.41	57.50	40.50			
	TOTAL	62.16	15.00	34.91	55.00	71.50			
10	SERVICE	22.50	20.00	17.50	7.50	46.00			277.69
	WAITING	55.28	-10.00	7.41	30.00	71.50			
	TOTAL	77.78	20.00	24.91	37.50	117.50			
11	SERVICE	17.50	20.00	17.50	17.50	26.00			258.22
	WAITING	74.30	-25.00	7.41	29.00	38.00			
	TOTAL	91.80	20.00	24.91	57.50	64.00			
12	SERVICE	32.50	35.00	22.50	42.50	51.00			326.03
	WAITING	88.47	-30.00	-22.50	-25.00	33.00			
	TOTAL	121.17	35.00	22.50	42.50	84.00			
13	SERVICE	7.50	45.00	7.50	52.50	16.00			286.12
	WAITING	120.21	-15.00	10.00	4.00	27.50			
	TOTAL	127.71	45.00	17.50	57.50	43.50			

SERVICE AND WAITING TIME REPORT

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7	TOTAL
14	SERVICE	17.50	20.00	7.50	32.50	16.00			
	WAITING	121.07	15.00	10.00	27.50	33.41			
	TOTAL	138.57	35.00	17.50	60.00	49.41			300.48
15	SERVICE	2.50	15.00	17.50	22.50	11.00			
	WAITING	113.12	25.00	10.00	32.41	37.00			
	TOTAL	115.62	40.00	27.50	54.91	48.00			286.04
16	SERVICE	12.50	10.00	17.50	57.50	26.00			
	WAITING	109.26	20.00	25.00	25.00	-15.00			
	TOTAL	121.76	30.00	42.50	72.50	26.00			312.76
17	SERVICE	27.50	10.00	12.50	52.50	26.00			
	WAITING	111.69	0.0	35.00	24.71	-14.50			
	TOTAL	139.19	10.00	47.50	77.21	26.00			310.10
18	SERVICE	7.50	25.00	12.50	12.50	41.00			
	WAITING	136.27	-5.00	37.50	52.41	-6.50			
	TOTAL	143.77	25.00	50.00	64.91	41.00			354.68
19	SERVICE	2.50	10.00	12.50	17.50	26.00			
	WAITING	142.55	0.0	37.50	57.50	0.50			
	TOTAL	145.05	10.00	50.00	75.00	26.50			324.55
20	SERVICE	2.50	15.00	12.50	57.50	71.00			
	WAITING	134.04	7.50	47.50	50.00	5.91			
	TOTAL	136.54	22.50	60.00	117.50	76.91			413.45
21	SERVICE	7.50	15.00	12.50	12.50	61.00			
	WAITING	127.06	12.50	47.50	69.71	-20.41			
	TOTAL	135.36	27.50	60.00	102.21	61.00			386.27
22	SERVICE	2.50	15.00	7.50	27.50	91.00			
	WAITING	117.54	12.50	57.50	34.91	52.00			
	TOTAL	120.04	27.50	65.00	122.41	143.00			477.35
23	SERVICE	2.50	15.00	12.50	22.50	86.00			
	WAITING	86.51	22.50	52.50	15.00	35.91			
	TOTAL	89.01	37.50	65.00	107.50	121.91			420.32
24	SERVICE	2.50	15.00	12.50	17.50	11.00			
	WAITING	86.90	22.50	42.50	35.00	117.91			
	TOTAL	89.40	37.50	55.00	122.50	128.91			453.31
25	SERVICE	17.50	10.00	12.50	22.50	91.00			
	WAITING	88.12	17.50	47.50	34.91	77.00			
	TOTAL	105.62	27.50	60.00	107.41	168.00			508.54
26	SERVICE	7.50	10.00	12.50	42.50	56.00			
	WAITING	100.58	32.50	57.50	24.71	145.50			
	TOTAL	108.08	42.50	70.00	117.21	201.50			559.57

## SERVICE AND WAITING TIME REPORT

PAGE 3

CUSTOMER		STATION 1	STATION 2	STATION 3	STATION 4	STATION 5	STATION 6	STATION 7	TOTAL
27	SERVICE	2.50	20.00	17.50	17.50	71.00			
	WAITING	107.71	37.50	52.50	90.00	91.41			
	TOTAL	110.21	57.50	70.00	117.50	162.41			517.62
28	SERVICE	7.50	25.00	17.50	12.50	41.00			
	WAITING	95.05	32.50	42.50	100.00	145.91			
	TOTAL	102.55	57.50	70.00	112.50	186.91			559.46
29	SERVICE	2.50	15.00	17.50	27.50	16.00			
	WAITING	99.91	47.50	72.50	95.00	132.50			
	TOTAL	102.41	62.50	90.00	112.41	148.50			515.82
30	SERVICE	2.50	15.00	17.50	12.50	36.00			
	WAITING	99.95	52.50	92.50	74.31	161.50			
	TOTAL	102.45	67.50	100.00	107.41	197.50			574.85

SUMMARY REPORT

AVERAGE INTERARRIVAL TIME OF PERIOD 1	7.17
AVERAGE INTERARRIVAL TIME OF PERIOD 2	11.45
AVERAGE INTERARRIVAL TIME OF PERIOD 3	6.15

NUMBER OF SERVER AT STATION 1	1
NUMBER OF SERVER AT STATION 2	2
NUMBER OF SERVER AT STATION 3	1
NUMBER OF SERVER AT STATION 4	2
NUMBER OF SERVER AT STATION 5	2

AVERAGE SERVICE TIME AT STATION 1	10.17
AVERAGE SERVICE TIME AT STATION 2	18.83
AVERAGE SERVICE TIME AT STATION 3	15.00
AVERAGE SERVICE TIME AT STATION 4	34.00
AVERAGE SERVICE TIME AT STATION 5	42.50

AVERAGE WAITING TIME AT STATION 1	79.46
AVERAGE WAITING TIME AT STATION 2	11.09
AVERAGE WAITING TIME AT STATION 3	32.46
AVERAGE WAITING TIME AT STATION 4	48.80
AVERAGE WAITING TIME AT STATION 5	66.90

UTILIZATION OF STATION 1	0.95
UTILIZATION OF STATION 2	0.75
UTILIZATION OF STATION 3	0.95
UTILIZATION OF STATION 4	0.96
UTILIZATION OF STATION 5	0.93

AVERAGE WAITING TIME IN SYSTEM	219.61
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AVERAGE TIME SPENT IN SYSTEM	340.11
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## ประวัติผู้เขียน

นายวิชา พงศ์ประยูร เกิดที่กรุงเทพฯ เมื่อวันที่ 19 กรกฎาคม พ.ศ. 2498  
สำเร็จการศึกษาระดับปริญญาตรีในแผนกวิศวกรรมอุตสาหกรรม คณะวิศวกรรมศาสตร์  
จุฬาลงกรณ์มหาวิทยาลัย เมื่อปี พ.ศ. 2520 เข้าศึกษาต่อในระดับปริญญาโทที่ Lamar  
University มลรัฐเท็กซัส ประเทศสหรัฐอเมริกา ในแผนกเดียวกัน และสำเร็จการ  
ศึกษาในปี พ.ศ. 2524