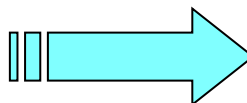


HISTORIC DATA:

Penelitian debit banjir Sungai Cipunagara
Data Debit maksimum Tahunan (m³/det)

No.	Tahun	Q (m ³ /det)
1	1969	102
2	1970	375
3	1971	265
4	1972	268
5	1973	361
6	1974	326
7	1975	246
8	1976	361
9	1977	371
10	1978	321
11	1979	371
12	1980	403
13	1981	400

 n = 13
 \bar{Q} = 320,769
s = 83,485

Sumber: Puslitbang Sumber Daya Air, Bandung, 1995

Hitungan Annual Lag One Serial Correlation Coefficient r(1)

		i = 1 s/d n	i = 1 s/d (n-1)	i = 2 s/d n			
r(k)	i	X _i	X _i	X _i	X _i X _{i+k}	X _i ²	X _i ²
r(1)							
k=1	1	102	102	0	38250	10404	10404
	2	375	375	375	99375	140625	140625
	3	265	265	265	71020	70225	70225
	4	268	268	268	96748	71824	71824
	5	361	361	361	117686	130321	130321
	6	326	326	326	80196	106276	106276
	7	246	246	246	88806	60516	60516
	8	361	361	361	133931	130321	130321
	9	371	371	371	119091	137641	137641
	10	321	321	321	119091	103041	103041
	11	371	371	371	149513	137641	137641
	12	403	403	403	161200	162409	162409
	13	400	400	400	0	160000	0
	jumlah	4170	3770	4068	1274907	1421244	1261244

f1= 1274907,000
f2= 3770,000
f3= 4068,000
f4= 76835,667
f5= 42192,000
G1= -3123,000
G2= 56937,250
 $\Gamma_1 = -0,055$

Model Markov - Chain

$$Q_i = \Gamma_1 (Q_{i-1}) + (1 - \Gamma_1) \bar{Q} + S t (1 - \Gamma_1^2)^{1/2}$$

generate data by:

$$Q_i = -0.055 (Q_{i-1}) + (1+0.055) * 320.769 + 83.485 t (1 - (-0.055^2)^{1/2})$$

$$Q_i = -0.055 (Q_{i-1}) + 83.359 t + 338.411$$

GENERATE DATA

i	Q _{i-1}	-0.055 Q _{i-1}	t	83.359 t + 338.411	Q _i
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1	320,769	-17,642	-0,030	335,910	318,268	=nilai rerata data historis lihat tabel variat acak
2	318,268	-17,505	0,130	349,248	331,743	
3	331,743	-18,246	0,060	343,413	325,167	
4	325,167	-17,884	-1,790	189,198	171,314	
5	171,314	-9,422	0,680	395,095	385,673	
6	385,673	-21,212	-1,670	199,201	177,989	
7	177,989	-9,789	0,340	366,753	356,964	
8	356,964	-19,633	1,660	476,787	457,154	
9	457,154	-25,143	-1,690	197,534	172,391	
10	172,391	-9,481	1,890	495,960	486,478	
11	486,478	-26,756	0,220	356,750	329,994	
12	329,994	-18,150	0,600	388,426	370,277	
13	370,277	-20,365	0,300	363,419	343,053	
14	343,053	-18,868	3,050	592,656	573,788	
15	573,788	-31,558	0,750	400,930	369,372	
16	369,372	-20,315	-0,960	258,386	238,071	
17	238,071	-13,094	0,190	354,249	341,155	
18	341,155	-18,764	-0,270	315,904	297,141	
19	297,141	-16,343	0,180	353,416	337,073	
20	337,073	-18,539	0,810	405,932	387,393	
21	387,393	-21,307	0,240	358,417	337,111	
22	337,111	-18,541	-1,070	249,217	230,676	
23	230,676	-12,687	0,080	345,080	332,393	
24	332,393	-18,282	-1,820	186,698	168,416	
25	168,416	-9,263	1,920	498,460	489,197	
26	489,197	-26,906	-1,510	212,539	185,633	
27	185,633	-10,210	1,160	435,107	424,898	
28	424,898	-23,369	-0,130	327,574	304,205	
29	304,205	-16,731	1,030	424,271	407,539	
30	407,539	-22,415	1,610	472,619	450,204	
31	450,204	-24,761	-0,850	267,556	242,795	
32	242,795	-13,354	1,340	450,112	436,758	
33	436,758	-24,022	-0,630	285,895	261,873	
34	261,873	-14,403	0,250	359,251	344,848	
35	344,848	-18,967	-0,420	303,400	284,434	
36	284,434	-15,644	1,660	476,787	461,143	
37	461,143	-25,363	-0,990	255,886	230,523	

Tabel 2. Perhitungan Debit Rencana S. Cipunagara
METODE GUMBEL

TAHUN	Debit (m ³ /s)	Qi - Qi	(Qi - Qi) ²	PERIODE ULANG (T)	Yt	Yn	Sn	QT (m ³ /s)
1969	102	-228,662	52286,326	2	0,3665	0,548	1,16	315,775
1970	375	44,338	1965,855	5	1,4999	0,548	1,16	408,748
1971	265	-65,662	4311,503	10	2,2504	0,548	1,16	470,305
1972	268	-62,662	3926,531	20	2,9702	0,548	1,16	529,351
1973	361	30,338	920,392	25	3,1985	0,548	1,16	548,082
1974	326	-4,662	21,735	50	3,9019	0,548	1,16	605,781
1975	246	-84,662	7167,660	100	4,6001	0,548	1,16	663,054
1976	361	30,338	920,392					
1977	371	40,338	1627,151					
1978	321	-9,662	93,355					
1979	371	40,338	1627,151					
1980	403	72,338	5232,781					
1981	400	69,338	4807,753					
	318,27	-12,394	153,614					
	331,74	1,081	1,168					
	325,17	-5,495	30,199					
	171,31	-159,348	25391,725					
	385,67	55,011	3026,188					
	177,99	-152,673	23308,914					

	356,96	26,302	691,774				
	457,15	126,492	16000,202				
	172,39	-158,271	25049,776				
g	486,48	155,816	24278,620				
e	329,99	-0,668	0,447				
n	370,28	39,615	1569,325				
e	343,05	12,391	153,548				
r	573,79	243,126	59110,239				
a	369,37	38,710	1498,454				
t	238,07	-92,591	8573,117				
e	341,16	10,493	110,109				
d	297,14	-33,522	1123,691				
	337,07	6,411	41,099				
	387,39	56,731	3218,378				
	337,11	6,449	41,583				
	230,68	-99,986	9997,249				
	332,39	1,731	2,995				
	168,42	-162,246	26323,766				
	489,20	158,535	25133,462				
	185,63	-145,029	21033,405				
	424,90	94,236	8880,346				
	304,20	-26,457	699,977				
	407,54	76,877	5910,144				
	450,20	119,542	14290,357				
	242,79	-87,867	7720,684				
	436,76	106,096	11256,429				
	261,87	-68,789	4731,915				
	344,85	14,186	201,234				
	284,43	-46,228	2137,069				
	461,14	130,481	17025,306				
	230,52	-100,139	10027,882				
jumlah, n :	50,00		443652,980				
Ri :	330,66						
S :	95,15						

Tabel 1. Perhitungan Debit Rencana S. Cipunagara Metode Log Pearson III

Tahun	Qi (m ³ /s)	Ln Qi (m ³ /s)	(Ln Qi- Ln Q)	(Ln Qi- Ln Q) ³	T (tahun)	K	Ln Q _T (m ³ /s)	Q _T (m ³ /s)
1969	102	4,6250	-1,1282	-1,43609	2	0,094	5,784	325,162
1970	375	5,9269	0,1737	0,00524	5	0,856	6,036	418,269
1971	265	5,5797	-0,1735	-0,00522	10	1,205	6,151	469,420
1972	268	5,5910	-0,1622	-0,00427	25	1,541	6,263	524,710
1973	361	5,8889	0,1357	0,00250	50	1,74	6,329	560,401
1974	326	5,7869	0,0337	0,00004	100	1,907	6,384	592,236
1975	246	5,5053	-0,2479	-0,01523	200	2,051	6,431	620,990
1976	361	5,8889	0,1357	0,00250				
1977	371	5,9162	0,1630	0,00433				
1978	321	5,7714	0,0182	0,00001				
1979	371	5,9162	0,1630	0,00433				
1980	403	5,9989	0,2457	0,01484				
1981	400	5,9915	0,2383	0,01353				
	318,2679	5,7629	0,0097	0,00000				
	331,7429	5,8044	0,0512	0,00013				
	325,1667	5,7843	0,0311	0,00003				
	171,3142	5,1435	-0,6097	-0,22664				
	385,6728	5,9550	0,2018	0,00822				
	177,9895	5,1817	-0,5715	-0,18663				
	356,9636	5,8776	0,1244	0,00193				
	457,1539	6,1250	0,3718	0,05141				
	172,3908	5,1498	-0,6034	-0,21972				
g	486,478	6,1872	0,4340	0,08175				
e	329,9937	5,7991	0,0459	0,00010				
n	370,2767	5,9143	0,1611	0,00418				
e	343,0535	5,8379	0,0847	0,00061				
r	573,788	6,3523	0,5991	0,21499				
a	369,3719	5,9118	0,1586	0,00399				
t	238,0709	5,4726	-0,2806	-0,02210				
e	341,1553	5,8323	0,0791	0,00050				
d	297,1405	5,6942	-0,0590	-0,00021				
	337,0729	5,8203	0,0671	0,00030				
	387,3928	5,9594	0,2062	0,00877				
	337,1106	5,8204	0,0672	0,00030				
	230,6758	5,4410	-0,3122	-0,03042				
	332,3926	5,8063	0,0531	0,00015				
	168,416	5,1264	-0,6268	-0,24620				
	489,1974	6,1928	0,4396	0,08494				
	185,6331	5,2238	-0,5294	-0,14839				
	424,8976	6,0518	0,2987	0,02664				
	304,205	5,7177	-0,0355	-0,00004				
	407,5395	6,0101	0,2569	0,01696				
	450,2043	6,1097	0,3565	0,04531				
	242,7946	5,4922	-0,2610	-0,01777				
	436,7584	6,0794	0,3262	0,03471				
	261,8731	5,5679	-0,1853	-0,00637				
	344,8477	5,8431	0,0899	0,00073				
	284,4336	5,6505	-0,1027	-0,00108				
	461,1431	6,1337	0,3805	0,05510				
	230,5227	5,4403	-0,3128	-0,03062				
Jumlah		287,660		-1,90794				
Rata-rata	:	5,753						
Sx	:	0,331						
Cs	:	-1,122						

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