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LAMPIRAN

Lampiran 1 Data Jumlah Kriminalitas 24 Kabupaten/Kota Provinsi Sulawesi Selatan

KABUPATEN/KOTA	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
SELAYAR	1	1	56	6	1	8	0	0	61
BULUKUMBA	4	1	364	36	1	19	0	10	300
BANTAENG	1	2	40	3	0	6	0	0	15
JENEPONTO	0	181	0	20	3	7	0	21	168
TAKALAR	1	39	261	61	12	23	10	3	215
GOWA	4	13	327	44	5	7	1	54	482
SINJAI	7	2	73	14	0	3	0	0	87
MAROS	8	7	117	25	1	15	0	12	145
PANGKEP	0	4	70	2	0	3	0	3	58
BARRU	1	0	0	7	1	8	0	0	59
BONE	6	8	229	51	34	14	0	3	429
SOPPENG	2	1	11	9	2	7	0	0	67
WAJO	4	0	79	25	4	16	0	1	74
SIDRAP	0	6	100	11	1	2	0	0	117
PINRANG	4	0	74	16	5	4	0	3	142
ENREKANG	0	0	10	3	0	2	0	0	52
LUWU	2	2	158	23	37	15	0	1	101
TANA TORAJA	1	1	55	3	3	4	0	0	58
LUWU UTARA	0	1	180	22	0	17	1	2	198
LUWU TIMUR	0	1	141	21	4	21	1	1	56
TORAJA UTARA	0	0	78	4	1	4	0	0	64
MAKASSAR	10	23	1265	161	11	34	1	236	2091
PARE PARE	1	1	36	27	0	15	0	3	111
PALOPO	1	1	201	23	8	12	0	5	274

KABUPATEN/KOTA	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	X_{18}
SELAYAR	7	0	9	0	14	20	3	0	0
BULUKUMBA	31	6	0	73	151	131	40	0	0
BANTAENG	1	3	2	0	54	4	7	1	0
JENEPONTO	8	21	20	2	13	75	15	0	41
TAKALAR	36	9	25	0	0	129	61	0	76
GOWA	134	154	80	1	0	0	0	0	0
SINJAI	17	0	17	0	0	13	8	0	0
MAROS	52	44	15	0	63	29	19	0	0
PANGKEP	12	17	7	1	28	13	11	1	90
BARRU	12	17	5	0	31	20	13	1	0
BONE	21	97	65	0	135	100	109	1	4
SOPPENG	21	6	17	2	16	49	35	0	0
WAJO	6	0	6	0	73	28	20	1	0
SIDRAP	16	4	12	0	0	54	81	0	0
PINRANG	20	0	13	0	0	45	17	1	0
ENREKANG	0	0	12	0	0	8	2	1	0
LUWU	20	48	23	4	33	42	21	3	0
TANA TORAJA	11	2	15	0	0	23	18	1	0
LUWU UTARA	16	24	20	2	51	40	18	0	0
LUWU TIMUR	12	6	7	0	48	10	7	1	0
TORAJA UTARA	18	0	10	0	0	26	12	0	0
MAKASSAR	466	977	322	5	373	1093	395	1	0
PARE PARE	6	2	14	0	58	15	41	1	0
PALOPO	65	31	40	4	0	152	81	0	0

Keterangan:

X_1 hingga X_{18} adalah jenis kriminalitas

Lampiran 2 Data Standarisasi Jumlah Kriminalitas 24 Kabupaten/Kota Provinsi Sulawesi Selatan

KABUPATEN/KOTA	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
SELAYAR	-0,496	-0,305	-0,422	-0,601	-0,467	-0,384	-0,286	-0,308	-0,398
BULUKUMBA	0,554	-0,305	0,786	0,314	-0,467	0,986	-0,286	-0,101	0,178
BANTAENG	-0,496	-0,278	-0,484	-0,692	-0,569	-0,633	-0,286	-0,308	-0,508
JENEPONTO	-0,846	4,556	-0,641	-0,174	-0,263	-0,508	-0,286	0,126	-0,140
TAKALAR	-0,496	0,721	0,382	1,076	0,654	1,484	4,613	-0,246	-0,027
GOWA	0,554	0,019	0,641	0,557	-0,059	-0,508	0,204	0,806	0,617
SINJAI	1,604	-0,278	-0,355	-0,357	-0,569	-1,006	-0,286	-0,308	-0,335
MAROS	1,954	-0,143	-0,182	-0,022	-0,467	0,488	-0,286	-0,060	-0,195
PANGKEP	-0,846	-0,224	-0,367	-0,723	-0,569	-1,006	-0,286	-0,246	-0,405
BARRU	-0,496	-0,332	-0,641	-0,570	-0,467	-0,384	-0,286	-0,308	-0,402
BONE	1,254	-0,116	0,257	0,771	2,895	0,363	-0,286	-0,246	0,489
SOPPENG	-0,146	-0,305	-0,598	-0,509	-0,365	-0,508	-0,286	-0,308	-0,383
WAJO	0,554	-0,332	-0,331	-0,022	-0,161	0,612	-0,286	-0,287	-0,366
SIDRAP	-0,846	-0,170	-0,249	-0,448	-0,467	-1,131	-0,286	-0,308	-0,263
PINRANG	0,554	-0,332	-0,351	-0,296	-0,059	-0,882	-0,286	-0,246	-0,202
ENREKANG	-0,846	-0,332	-0,602	-0,692	-0,569	-1,131	-0,286	-0,308	-0,419
LUWU	-0,146	-0,278	-0,022	-0,083	3,201	0,488	-0,286	-0,287	-0,301
TANA TORAJA	-0,496	-0,305	-0,425	-0,692	-0,263	-0,882	-0,286	-0,308	-0,405
LUWU UTARA	-0,846	-0,305	0,065	-0,113	-0,569	0,737	0,204	-0,266	-0,067
LUWU TIMUR	-0,846	-0,305	-0,088	-0,143	-0,161	1,235	0,204	-0,287	-0,410
TORAJA UTARA	-0,846	-0,332	-0,335	-0,662	-0,467	-0,882	-0,286	-0,308	-0,390
MAKASSAR	2,654	0,289	4,317	4,123	0,552	2,853	0,204	4,561	4,494
PARE PARE	-0,496	-0,305	-0,500	0,039	-0,569	0,488	-0,286	-0,246	-0,277
PALOPO	-0,496	-0,305	0,147	-0,083	0,246	0,114	-0,286	-0,205	0,116

KABUPATEN/KOTA	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	X_{18}
SELAYAR	-0,370	-0,308	-0,348	-0,265	-0,416	-0,313	-0,500	-0,813	-0,360
BULUKUMBA	-0,116	-0,278	-0,487	4,671	1,282	0,196	-0,038	-0,813	-0,360
BANTAENG	-0,434	-0,293	-0,456	-0,265	0,080	-0,386	-0,450	0,581	-0,360
JENEPONTO	-0,360	-0,203	-0,178	-0,130	-0,428	-0,061	-0,350	-0,813	1,319
TAKALAR	-0,063	-0,263	-0,101	-0,265	-0,589	0,187	0,224	-0,813	2,752
GOWA	0,973	0,468	0,750	-0,197	-0,589	-0,405	-0,538	-0,813	-0,360
SINJAI	-0,264	-0,308	-0,224	-0,265	-0,589	-0,345	-0,438	-0,813	-0,360
MAROS	0,106	-0,087	-0,255	-0,265	0,192	-0,272	-0,301	-0,813	-0,360
PANGKEP	-0,317	-0,223	-0,379	-0,197	-0,242	-0,345	-0,400	0,581	3,325
BARRU	-0,317	-0,223	-0,410	-0,265	-0,205	-0,313	-0,375	0,581	-0,360
BONE	-0,222	0,181	0,518	-0,265	1,084	0,054	0,823	0,581	-0,196
SOPPENG	-0,222	-0,278	-0,224	-0,130	-0,391	-0,180	-0,101	-0,813	-0,360
WAJO	-0,381	-0,308	-0,395	-0,265	0,315	-0,276	-0,288	0,581	-0,360
SIDRAP	-0,275	-0,288	-0,302	-0,265	-0,589	-0,157	0,473	-0,813	-0,360
PINRANG	-0,233	-0,308	-0,286	-0,265	-0,589	-0,198	-0,326	0,581	-0,360
ENREKANG	-0,444	-0,308	-0,302	-0,265	-0,589	-0,368	-0,513	0,581	-0,360
LUWU	-0,233	-0,066	-0,132	0,006	-0,180	-0,212	-0,276	3,369	-0,360
TANA TORAJA	-0,328	-0,298	-0,255	-0,265	-0,589	-0,299	-0,313	0,581	-0,360
LUWU UTARA	-0,275	-0,187	-0,178	-0,130	0,043	-0,221	-0,313	-0,813	-0,360
LUWU TIMUR	-0,317	-0,278	-0,379	-0,265	0,006	-0,359	-0,450	0,581	-0,360
TORAJA UTARA	-0,254	-0,308	-0,333	-0,265	-0,589	-0,285	-0,388	-0,813	-0,360
MAKASSAR	4,486	4,617	4,495	0,073	4,032	4,604	4,392	0,581	-0,360
PARE PARE	-0,381	-0,298	-0,271	-0,265	0,130	-0,336	-0,026	0,581	-0,360
PALOPO	0,243	-0,152	0,132	0,006	-0,589	0,292	0,473	-0,813	-0,360

Keterangan:

X_1 hingga X_{18} adalah jenis kriminalitas

Lampiran 3 *Output* Hasil Uji Korelasi

```
#              x1           x2          x3          x4           x5          x6          x7          x8
#x1   1.000000000 -0.105966698  0.61714945 0.64959436  0.249816055 0.428400238 -0.07329193  0.59445986
#x2  -0.105966698  1.000000000  0.00182806 0.12789460  0.007167297 0.023303303  0.14720298  0.14027031
#x3   0.617149451  0.001828060  1.00000000 0.95265263  0.245851348 0.732568828  0.18646925  0.93685819
#x4   0.649594359  0.127894602  0.95265263 1.00000000  0.335767044 0.800730193  0.32334041  0.90075100
#x5   0.249816055  0.007167297  0.24585135 0.33576704  1.000000000 0.329700055  0.13418248  0.10876930
#x6   0.428400238  0.023303303  0.73256883 0.80073019  0.329700055 1.000000000  0.40794310  0.58901777
#x7  -0.073291925  0.147202980  0.18646925 0.32334041  0.134182481 0.407943100  1.00000000  0.05017047
#x8   0.594459859  0.140270309  0.93685819 0.90075100  0.108769304 0.589017772  0.05017047  1.00000000
#x9   0.633032822  0.094485593  0.97197899 0.94874286  0.224273691 0.650869609  0.09305942  0.97647926
#x10  0.622727479  0.047734496  0.95438840 0.90984347  0.139694422 0.605124560  0.09013373  0.98653083
#x11  0.611203491  0.070653509  0.94428869 0.91095248  0.199354222 0.612144970  0.04238155  0.98883517
#x12  0.613929239  0.085010553  0.94043675 0.92398978  0.254205739 0.595657000  0.07843605  0.97547123
#x13  0.138690851 -0.045438656  0.22743622 0.12080287 -0.060445117 0.254409459 -0.06744250  0.03850026
#x14  0.647949990 -0.013786810  0.87114424 0.85070335  0.239130587 0.745666271 -0.05108392  0.82756137
#x15  0.564270202  0.105654468  0.94351738 0.91390445  0.181863853 0.664181682  0.11683287  0.95123373
#x16  0.561472994  0.048638201  0.91158760 0.90711152  0.274457771 0.645123161  0.11345913  0.89494990
#x17  0.003535158 -0.206386107  0.04357938 0.05188136  0.585651043 0.127035182 -0.18312120  0.05523421
#x18 -0.255366841  0.393430897 -0.05202543 0.02254686 -0.001284767 0.004968597  0.55549426 -0.06524800
#              x9          x10         x11         x12          x13         x14         x15         x16
#x1   0.63303282  0.62272748  0.611203491  0.61392924  0.138690851  0.64794999  0.56427020  0.56147299
#x2   0.09448559  0.04773450  0.070653509  0.08501055 -0.045438656 -0.01378681  0.10565447  0.04863820
#x3   0.97197899  0.95438840  0.944288690  0.94043675  0.227436223  0.87114424  0.94351738  0.91158760
#x4   0.94874286  0.90984347  0.910952483  0.92398978  0.120802873  0.85070335  0.91390445  0.90711152
#x5   0.22427369  0.13969442  0.199354222  0.25420574 -0.060445117  0.23913059  0.18186385  0.27445777
#x6   0.65086961  0.60512456  0.612144970  0.59565700  0.254409459  0.74566627  0.66418168  0.64512316
#x7   0.09305942  0.09013373  0.042381548  0.07843605 -0.067442498 -0.05108392  0.11683287  0.11345913
#x8   0.97647926  0.98653083  0.988835173  0.97547123  0.038500264  0.82756137  0.95123373  0.89494990
#x9   1.00000000  0.97777860  0.983725585  0.98680787  0.099291661  0.87068671  0.96758937  0.94438871
#x10  0.97777860  1.00000000  0.981680968  0.97827780  0.037969788  0.80249634  0.94699704  0.90198220
#x11  0.98372559  0.98168097  1.000000000  0.98886865  0.002405743  0.85856036  0.96601277  0.93078513
#x12  0.98680787  0.97827780  0.988868648  1.00000000 -0.040842308  0.81982068  0.95112525  0.93323047
#x13  0.09929166  0.03796979  0.002405743 -0.04084231  1.000000000  0.31825654  0.10568700  0.05136367
#x14  0.87068671  0.80249634  0.858560361  0.81982068  0.318256544  1.00000000  0.86919817  0.85910166
#x15  0.96758937  0.94699704  0.966012775  0.95112525  0.105686996  0.86919817  1.00000000  0.96845625
#x16  0.94438871  0.90198220  0.930785127  0.93323047  0.051363666  0.85910166  0.96845625  1.00000000
#x17  0.04148448  0.02500902  0.124887891  0.09003570 -0.150946953  0.17528829  0.06914485  0.07551990
#x18 -0.07517263 -0.08727642 -0.084757391 -0.08364223 -0.078767396 -0.14200397 -0.03410729 -0.05362372
#             x17          x18
#x1   0.003535158 -0.255366841
#x2  -0.206386107  0.393430897
#x3   0.043579378 -0.052025430
#x4   0.051881363  0.022546862
#x5   0.585651043 -0.001284767
#x6   0.127035182  0.004968597
#x7  -0.183121201  0.555494261
#x8   0.055234215 -0.065248001
#x9   0.041484477 -0.075172633
#x10  0.025009021 -0.087276420
#x11  0.124887891 -0.084757391
#x12  0.090035700 -0.083642231
#x13 -0.150946953 -0.078767396
#x14  0.175288288 -0.142003972
#x15  0.069144854 -0.034107293
#x16  0.075519903 -0.053623723
#x17  1.000000000 -0.072184822
#x18 -0.072184822  1.000000000
```

Lampiran 4 *Output* Uji KMO dan Uji *Batrlett*

```
##Kaiser-Meyer-Olkin factor adequacy
##Call: KMO(r = data)
##Overall MSA =  0.59
##MSA for each item =
##  X1   X2   X3   X4   X5   X6   X7   X8   X9  X10  X11  X12  X13  X14  X
15  #X16  X17
##0.43 0.07 0.83 0.58 0.19 0.44 0.13 0.58 0.66 0.64 0.69 0.93 0.19 0.80 0.
72 #0.61 0.27
## X18
##0.31
##
##TANPAMKS
##Kaiser-Meyer-Olkin factor adequacy
##Call: KMO(r = data_std)
##Overall MSA =  0.41
##MSA for each item =
##  X1   X2   X3   X4   X5   X6   X7   X8   X9  X10  X11  X12  X13  X14  X
15  X16  X17  X18
##0.27 0.13 0.54 0.46 0.30 0.32 0.23 0.49 0.47 0.44 0.42 0.90 0.55 0.35 0.
##31 0.31 0.51 0.37
##$chisq
##[1] 762.4852
##
##$p.value
##[1] 1.175823e-81
##
##$df
##[1] 153
##
##TANPA KOTA MAKASSAR
##Kaiser-Meyer-Olkin factor adequacy
##Call: KMO(r = data)
##Overall MSA =  0.41
##MSA for each item =
##  X1   X2   X3   X4   X5   X6   X7   X8   X9  X10  X11  X12  X13  X14  X
##15  X16  X17  X18
##0.27 0.13 0.54 0.46 0.30 0.32 0.23 0.49 0.47 0.44 0.42 0.90 0.55 0.35 0.
##31 0.31 0.51 0.37
##> bartlett_test <- cortest.bartlett(data)
##R was not square, finding R from data
##> print(bartlett_test)
##$chisq
##[1] 471.5757
##
##$p.value
##[1] 3.598092e-34
##
##$df
##[1] 153
```

Lampiran 5 *Output* Hasil Analisis Komponen Utama

```
#eigen() decomposition
#$values
# [1] 1.039844e+01 1.974950e+00 1.618351e+00 1.246049e+00 8.848322e-01 6.480245e-01
# [7] 4.764208e-01 3.323968e-01 2.134070e-01 1.143350e-01 5.012904e-02 2.196446e-02
#[13] 8.760854e-03 7.114756e-03 2.082842e-03 1.692112e-03 8.811638e-04 1.681288e-04
#
#$vectors
#              [,1]         [,2]         [,3]         [,4]         [,5]         [,6]
# [1,]  0.20767232  0.197171202  0.052322081 -0.10165565 -0.0560030944  0.648795459
# [2,]  0.01978407 -0.424684024  0.069991426  0.22864433  0.7247991543  0.289030220
# [3,]  0.30318571 -0.020275079  0.032215705 -0.09382676 -0.0500231085 -0.075443367
# [4,]  0.30030764 -0.111843579 -0.055768775 -0.07786598 -0.0476549761  0.119931314
# [5,]  0.08574739  0.069675648 -0.654270033 -0.09942175  0.1755424370  0.369141667
# [6,]  0.22670933 -0.117468731 -0.162655957 -0.39069240 -0.0969519025  0.011181049
# [7,]  0.04099385 -0.559125459 -0.190104994 -0.23205819 -0.4507769234  0.102378054
# [8,]  0.29798552 -0.009983962  0.100458371  0.16444700  0.0397844392 -0.099558030
# [9,]  0.30673921 -0.005766112  0.055200587  0.06900094  0.0189732653 -0.020229929
#[10,]  0.29918357  0.001833488  0.091848240  0.12933805 -0.0703286369 -0.054082030
#[11,]  0.30278262  0.025636918  0.029363082  0.16176472  0.0009676254 -0.097726506
#[12,]  0.30130145  0.006091289  0.010307423  0.18450683 -0.0273324998 -0.002490729
#[13,]  0.03810084  0.071581757  0.231500410 -0.74189559  0.3876577139 -0.184321077
#[14,]  0.28064400  0.115574702  0.010358305 -0.17927933  0.1528030922 -0.116676232
#[15,]  0.30106219 -0.030830776  0.049408063  0.06151188  0.0286662850 -0.143214161
#[16,]  0.29454021 -0.008523514 -0.005864402  0.06676496 -0.0205309619 -0.073154653
#[17,]  0.03051188  0.268685090 -0.629832496  0.07925240  0.1788795614 -0.388749888
#[18,] -0.02352090 -0.586553566 -0.148800776  0.01816209  0.0940027159 -0.284956739
#              [,7]         [,8]         [,9]        [,10]        [,11]        [,12]
# [1,]  0.529914105 -0.348946754 -0.13016865  0.15604893 -0.154513783 -0.022488012
# [2,] -0.270749743 -0.139627937 -0.14625020  0.11845203 -0.006249902 -0.007216512
# [3,]  0.017271058  0.167653168 -0.12478240 -0.21537725 -0.004203836 -0.056611659
# [4,] -0.056154412 -0.015498391 -0.04883619 -0.01596030  0.202390405  0.629604728
# [5,] -0.001421016  0.490426015  0.19229591 -0.19820689  0.011974864 -0.194795796
# [6,] -0.431512018 -0.492329550  0.18731314 -0.35125552 -0.343426740  0.003813067
# [7,] -0.115433749  0.072382785 -0.34298115  0.38219907  0.213883865 -0.174805594
# [8,]  0.014794190 -0.025660784 -0.26162234 -0.13244585  0.066950963 -0.086851844
# [9,]  0.011798555  0.127592143 -0.02925956 -0.08013408  0.146596594  0.189772995
#[10,]  0.037707184  0.086899052 -0.24831070 -0.23773264 -0.238563349 -0.051179978
#[11,]  0.025532422  0.004707945 -0.08039815 -0.05706086  0.092861404 -0.295027134
#[12,]  0.005208220  0.140604661 -0.05152401 -0.12729869  0.138476911  0.076580374
#[13,]  0.138379758  0.273162066 -0.23815205  0.07615587 -0.066384246  0.045458864
#[14,]  0.034140891 -0.296297615  0.38000800  0.13194707  0.638197936 -0.278326231
#[15,] -0.033731463  0.061083313  0.10168557  0.35850966 -0.416429987 -0.412347868
#[16,] -0.036965924  0.188316567  0.43500664  0.49821323 -0.253440974  0.347375331
#[17,]  0.075197026 -0.295123189 -0.39333976  0.23682055 -0.046319783  0.142227286
#[18,]  0.641850482 -0.096248569  0.24191494 -0.22417138 -0.095369983  0.042134431
#             [,13]        [,14]        [,15]        [,16]        [,17]        [,18]
# [1,]  0.04754372  0.0018314039  0.06830259  0.05011948  0.037668214 -0.041765272
# [2,]  0.08416972 -0.0718714118  0.10391060 -0.01288374 -0.006799135  0.040380157
# [3,]  0.82938921 -0.2778960752  0.05759835  0.09643227 -0.123920620  0.054404190
# [4,] -0.03638018  0.1341583118 -0.50163188 -0.05894235 -0.171221850  0.352609839
# [5,] -0.10457514 -0.0369135239 -0.10762040 -0.03042026 -0.004390140 -0.055321291
# [6,] -0.06400006  0.0536579554  0.08955163  0.09752443  0.096528298 -0.085698569
# [7,] -0.05661614 -0.0505805952  0.11659517 -0.01597566  0.024540341 -0.056840317
# [8,] -0.21027544 -0.2129801771 -0.44240031  0.24440839 -0.053016575 -0.644782061
# [9,]  0.12399051  0.3706496904  0.18817322 -0.47743474  0.538485065 -0.331700684
#[10,] -0.36130726 -0.3705601721  0.23366599 -0.50991199 -0.240134631  0.225028474
#[11,] -0.14924495 -0.0634638802 -0.09332124  0.34339534  0.593581968  0.509662044
#[12,] -0.14805245  0.4434071000  0.50304168  0.44890094 -0.370644985 -0.010540168
#[13,] -0.16316696  0.0467485873  0.04965099  0.09560509  0.042959135  0.012418514
#[14,] -0.04447667 -0.1368176731  0.06102952 -0.19667615 -0.199988722  0.005999816
#[15,]  0.10422976  0.4490533916 -0.31439989 -0.17085981 -0.220268934  0.067821299
#[16,] -0.06463168 -0.3854365909  0.18411820  0.17078342  0.115664927 -0.120607212
#[17,]  0.06939189  0.0008910248  0.09856457 -0.01673650  0.001766192  0.006501656
#[18,] -0.02058694  0.0315683274 -0.01583568  0.01652265  0.004767220 -0.006648599
#
#Importance of components:
#                           PC1    PC2     PC3     PC4     PC5    PC6     PC7     PC8
#Standard deviation     3.2247 1.4053 1.27214 1.11627 0.94066 0.8050 0.69023 0.57654
#Proportion of Variance 0.5777 0.1097 0.08991 0.06922 0.04916 0.0360 0.02647 0.01847
#Cumulative Proportion  0.5777 0.6874 0.77732 0.84654 0.89570 0.9317 0.95817 0.97664
#                           PC9     PC10     PC11     PC12     PC13     PC14     PC15     PC
16
#Standard deviation     0.46196 0.33813 0.22390 0.14820 0.09360 0.08435 0.04564 0.041
14
#Proportion of Variance 0.01186 0.00635 0.00278 0.00122 0.00049 0.00040 0.00012 0.000
09
#Cumulative Proportion  0.98849 0.99484 0.99763 0.99885 0.99934 0.99973 0.99985 0.999
94
```

Lampiran 5 *Output* Hasil Analisis Komponen Utama (Lanjutan)

```
#                            PC17     PC18
#Standard deviation     0.02968 0.01297
#Proportion of Variance 0.00005 0.00001
#Cumulative Proportion  0.99999 1.00000
```

Lampiran 6 Skor Keempat Komponen Utama Pertama

KABUPATEN/KOTA	Y_1	Y_2	Y_3	Y_4
SELAYAR	-1,463	0,214	0,783	0,237
BULUKUMBA	0,941	0,658	1,861	-4,407
BANTAENG	-1,481	0,670	0,006	0,351
JENEPONTO	-1,012	-2,921	0,818	1,497
TAKALAR	0,578	-5,172	-1,567	-1,417
GOWA	0,984	-0,099	0,826	0,637
SINJAI	-1,035	0,635	1,062	0,332
MAROS	0,108	0,527	0,851	-0,307
PANGKEP	-1,629	-1,571	-0,451	0,674
BARRU	-1,361	0,626	-0,098	0,339
BONE	1,682	0,900	-2,273	-0,409
SOPPENG	-1,171	0,305	0,797	0,227
WAJO	-0,473	0,726	-0,423	-0,357
SIDRAP	-1,230	0,122	0,910	0,706
PINRANG	-0,993	0,832	-0,209	0,461
ENREKANG	-1,838	0,608	0,060	0,727
LUWU	-0,085	1,531	-4,290	-0,359
TANA TORAJA	-1,493	0,651	-0,140	0,597
LUWU UTARA	-0,530	-0,272	0,620	-0,424
LUWU TIMUR	-0,705	0,069	-0,676	-0,527
TORAJA UTARA	-1,607	0,199	0,860	0,516
MAKASSAR	14,479	0,182	0,453	0,909
PARE PARE	-0,699	0,468	-0,194	-0,060
PALOPO	0,033	0,112	0,414	0,056

Lampiran 7 Matriks keanggotaan awal U_0

2 *Cluster*		**2 *Cluster* (Tanpa Makassar)**	
0,520	0,480	0,520	0,480
0,527	0,473	0,527	0,473
0,425	0,575	0,425	0,575
0,529	0,471	0,529	0,471
0,503	0,497	0,503	0,497
0,648	0,352	0,648	0,352
0,552	0,448	0,552	0,448
0,682	0,318	0,682	0,318
0,473	0,527	0,473	0,527
0,407	0,593	0,407	0,593
0,441	0,559	0,441	0,559
0,538	0,462	0,538	0,462
0,299	0,701	0,299	0,701
0,540	0,460	0,540	0,460
0,379	0,621	0,379	0,621
0,446	0,554	0,446	0,554
0,436	0,564	0,436	0,564
0,416	0,584	0,416	0,584
0,661	0,339	0,661	0,339
0,305	0,695	0,305	0,695
0,517	0,483	0,517	0,483
0,507	0,493	0,295	0,705
0,295	0,705	0,904	0,096
0,904	0,096		

Lampiran 7 Matriks keanggotaan awal U_0 (Lanjutan)

3 *Cluster*			3 *Cluster* (Tanpa Makassar)		
0,841	0,037	0,122	0,841	0,037	0,122
0,173	0,634	0,193	0,173	0,634	0,193
0,717	0,046	0,237	0,717	0,046	0,237
0,556	0,158	0,285	0,556	0,158	0,285
0,341	0,318	0,340	0,341	0,318	0,340
0,413	0,175	0,412	0,413	0,175	0,412
0,750	0,061	0,189	0,750	0,061	0,189
0,467	0,140	0,393	0,467	0,140	0,393
0,658	0,082	0,260	0,658	0,082	0,260
0,711	0,042	0,246	0,711	0,042	0,246
0,190	0,216	0,594	0,190	0,216	0,594
0,852	0,032	0,116	0,852	0,032	0,116
0,267	0,049	0,685	0,267	0,049	0,685
0,858	0,033	0,110	0,858	0,033	0,110
0,597	0,047	0,356	0,597	0,047	0,356
0,716	0,054	0,230	0,716	0,054	0,230
0,286	0,203	0,511	0,286	0,203	0,511
0,702	0,047	0,251	0,702	0,047	0,251
0,736	0,063	0,202	0,736	0,063	0,202
0,373	0,057	0,570	0,373	0,057	0,570
0,822	0,042	0,135	0,822	0,042	0,135
0,279	0,401	0,320	0,546	0,039	0,416
0,546	0,039	0,416	0,561	0,062	0,378
0,561	0,062	0,378			

Lampiran 8 Pusat *Cluster* Dua *Cluster* Empat Komponen Utama

μ_{i1}	$(\mu_{i1})^2$	$(\mu_{i1})^2 Y_{i1}$	$(\mu_{i1})^2 Y_{i2}$	$(\mu_{i1})^2 Y_{i3}$	$(\mu_{i1})^2 Y_{i4}$
	0,271	-0,396	0,058	0,212	0,064
	0,277	0,261	0,183	0,516	-1,222
	0,180	-0,267	0,121	0,001	0,063
	0,279	-0,283	-0,816	0,228	0,418
	0,253	0,146	-1,309	-0,397	-0,359
	0,419	0,413	-0,041	0,346	0,267
	0,304	-0,315	0,193	0,323	0,101
	0,465	0,050	0,245	0,396	-0,143
	0,224	-0,364	-0,351	-0,101	0,151
	0,166	-0,225	0,104	-0,016	0,056
	0,194	0,327	0,175	-0,441	-0,079
	0,290	-0,339	0,088	0,231	0,066
	0,090	-0,042	0,065	-0,038	-0,032
	0,292	-0,359	0,036	0,266	0,206
	0,143	-0,142	0,119	-0,030	0,066
	0,199	-0,366	0,121	0,012	0,145
	0,190	-0,016	0,291	-0,816	-0,068
	0,173	-0,259	0,113	-0,024	0,104
	0,436	-0,231	-0,119	0,271	-0,185
	0,093	-0,065	0,006	-0,063	-0,049
	0,267	-0,429	0,053	0,230	0,138
	0,257	3,724	0,047	0,116	0,234
	0,087	-0,061	0,041	-0,017	-0,005
	0,817	0,027	0,092	0,339	0,046
Total	6,368	0,785	-0,487	1,544	-0,017
Centroids		**0,123**	**-0,076**	**0,242**	**-0,003**

Lampiran 8 Pusat Cluster *Dua* Cluster *Empat* Komponen Utama (Lanjutan)

μ_{i2}	$(\mu_{i2})^2$	$(\mu_{i2})^2 Y_{i1}$	$(\mu_{i2})^2 Y_{i2}$	$(\mu_{i2})^2 Y_{i3}$	$(\mu_{i2})^2 Y_{i4}$
	0,230	-0,337	0,049	0,180	0,055
	0,224	0,211	0,148	0,417	-0,988
	0,331	-0,490	0,222	0,002	0,116
	0,222	-0,225	-0,649	0,182	0,332
	0,247	0,143	-1,277	-0,387	-0,350
	0,124	0,122	-0,012	0,103	0,079
	0,201	-0,208	0,128	0,214	0,067
	0,101	0,011	0,053	0,086	-0,031
	0,278	-0,452	-0,436	-0,125	0,187
	0,352	-0,479	0,220	-0,034	0,119
	0,313	0,526	0,281	-0,711	-0,128
	0,213	-0,250	0,065	0,170	0,048
	0,491	-0,232	0,356	-0,208	-0,176
	0,211	-0,260	0,026	0,192	0,149
	0,386	-0,383	0,321	-0,081	0,178
	0,307	-0,563	0,186	0,018	0,223
	0,318	-0,027	0,487	-1,365	-0,114
	0,341	-0,508	0,222	-0,048	0,203
	0,115	-0,061	-0,031	0,071	-0,049
	0,484	-0,341	0,033	-0,327	-0,255
	0,233	-0,375	0,046	0,201	0,120
	0,243	3,517	0,044	0,110	0,221
	0,497	-0,347	0,232	-0,096	-0,030
	0,009	0,000	0,001	0,004	0,001
Total	6,471	-1,009	0,716	-1,432	-0,020
Centroids		**-0,156**	**0,111**	**-0,221**	**-0,003**

Lampiran 9 Fungsi Objektif Pertama *Fuzzy C-Means*

Empat Komponen Utama						
2 *Cluster*			**3 *Cluster***			
L1	**L2**	**Total**	**L1**	**L2**	**L3**	**Total**
0,799	0,641	1,440	0,347	0,037	0,082	0,465
6,441	5,655	12,096	0,852	5,448	0,947	7,247
0,598	0,743	1,341	0,386	0,061	0,234	0,681
3,343	2,945	6,287	3,296	0,943	1,342	5,581
7,960	7,966	15,925	4,267	3,671	3,644	11,582
0,625	0,354	0,979	0,694	0,370	0,575	1,639
0,801	0,564	1,365	0,466	0,091	0,189	0,745
0,384	0,150	0,534	0,423	0,261	0,388	1,073
1,397	1,530	2,927	1,723	0,223	0,520	2,466
0,485	0,651	1,136	0,337	0,050	0,217	0,604
1,917	2,620	4,537	0,540	0,650	1,738	2,929
0,632	0,460	1,092	0,229	0,026	0,061	0,316
0,140	0,317	0,457	0,119	0,043	0,477	0,639
0,823	0,621	1,443	0,408	0,029	0,068	0,505
0,357	0,555	0,912	0,316	0,056	0,342	0,714
0,972	1,131	2,103	0,678	0,101	0,324	1,103
4,430	5,950	10,380	2,020	1,641	3,925	7,585
0,632	0,833	1,465	0,461	0,066	0,273	0,800
0,343	0,135	0,478	0,502	0,065	0,111	0,678
0,169	0,379	0,548	0,252	0,062	0,402	0,716
0,994	0,829	1,824	0,516	0,054	0,119	0,689
53,245	52,340	105,585	18,505	21,742	20,809	61,056
0,102	0,212	0,314	0,190	0,030	0,235	0,455
0,063	0,004	0,067	0,322	0,055	0,189	0,566
P_1		**175,237**	P_1			**110,835**

Lampiran 9 Fungsi Objektif Pertama Fuzzy C-Means (Lanjutan)

Tanpa Kota Makassar						
2 *Cluster*			3 *Cluster*			
L1	**L2**	**Total**	**L1**	**L2**	**L3**	**Total**
6494,607	1783,535	8278,143	2540,676	162,531	365,345	3068,552
26147,489	29022,124	55169,612	4576,579	4502,285	3434,537	12513,401
7503,774	5891,901	13395,676	6583,713	314,663	2224,001	9122,377
13950,489	9989,703	23940,192	13327,787	3415,181	4299,991	21042,958
8005,400	13261,042	21266,442	7583,662	2257,662	4030,467	13871,790
70334,845	27954,489	98289,334	42241,767	3183,935	28804,641	74230,343
5017,102	962,019	5979,121	989,465	388,142	625,374	2002,981
1987,381	397,430	2384,811	1666,980	1128,798	459,043	3254,821
6354,733	3611,364	9966,097	4417,177	794,920	1911,714	7123,811
5819,803	5240,741	11060,545	4560,095	264,508	2112,971	6937,573
19577,293	44520,137	64097,431	5971,315	2112,973	34157,795	42242,083
8312,876	2553,925	10866,801	4689,344	141,079	398,220	5228,643
1660,295	2375,480	4035,774	333,994	225,377	7599,046	8158,417
2699,913	1099,165	3799,078	3544,969	83,651	131,983	3760,603
1082,279	1192,993	2275,273	777,579	180,255	1185,498	2143,332
7546,198	5162,502	12708,700	4992,976	456,343	2042,261	7491,579
1542,690	1966,543	3509,234	782,295	2467,612	1868,032	5117,939
4212,653	2879,825	7092,478	1815,218	268,172	1600,806	3684,195
1753,434	1476,208	3229,642	11137,470	108,959	130,430	11376,859
1748,214	3757,034	5505,249	1205,834	278,539	5569,969	7054,341
5257,066	1475,169	6732,236	1820,684	198,833	382,578	2402,095
1625,209	2934,286	4559,494	1370,131	155,571	2919,347	4445,049
22821,611	502,330	23323,941	20279,647	95,807	4592,150	24967,604
6494,607	1783,535	8278,143	2540,676	162,531	365,345	3068,552
P_1		**401465,303**	P_1			**281241,346**

Lampiran 10 Perubahan Matriks Keanggotaan U

Empat Komponen Utama									
2 *Cluster*				**3 *Cluster***					
U_1		U_{13}		U_1				U_{69}	
0,486	0,514	0,995	0,005	0,903	0,016	0,081	0,925	0,002	0,073
0,521	0,479	0,883	0,117	0,236	0,497	0,267	0,427	0,057	0,515
0,404	0,596	0,995	0,005	0,829	0,022	0,149	0,907	0,002	0,091
0,526	0,474	0,952	0,048	0,518	0,147	0,335	0,532	0,026	0,442
0,506	0,494	0,864	0,136	0,315	0,319	0,366	0,373	0,063	0,565
0,656	0,344	0,977	0,023	0,394	0,132	0,474	0,489	0,013	0,499
0,516	0,484	0,993	0,007	0,840	0,028	0,132	0,885	0,003	0,112
0,642	0,358	0,991	0,009	0,521	0,076	0,403	0,612	0,006	0,382
0,469	0,531	0,983	0,017	0,612	0,073	0,316	0,571	0,010	0,419
0,387	0,613	0,996	0,004	0,826	0,020	0,154	0,908	0,002	0,091
0,459	0,541	0,930	0,070	0,196	0,210	0,593	0,300	0,026	0,674
0,497	0,503	0,996	0,004	0,924	0,012	0,064	0,943	0,001	0,056
0,292	0,708	0,996	0,004	0,365	0,034	0,601	0,523	0,003	0,474
0,510	0,490	0,993	0,007	0,894	0,018	0,088	0,899	0,002	0,098
0,366	0,634	0,996	0,004	0,733	0,026	0,241	0,851	0,002	0,146
0,430	0,570	0,991	0,009	0,797	0,031	0,172	0,860	0,004	0,137
0,445	0,555	0,911	0,089	0,306	0,190	0,504	0,392	0,040	0,568
0,401	0,599	0,994	0,006	0,802	0,025	0,173	0,878	0,002	0,120
0,599	0,401	0,997	0,003	0,717	0,040	0,243	0,664	0,003	0,333
0,300	0,700	0,996	0,004	0,390	0,037	0,573	0,324	0,002	0,673
0,488	0,512	0,992	0,008	0,875	0,022	0,102	0,898	0,003	0,099
0,510	0,490	0,002	0,998	0,254	0,447	0,299	0,000	1,000	0,000
0,268	0,732	0,999	0,001	0,665	0,021	0,313	0,782	0,002	0,217
0,852	0,148	0,997	0,003	0,543	0,038	0,419	0,595	0,003	0,401

Lampiran 10 Perubahan Matriks Keanggotaan $\boldsymbol{U}$ (Lanjutan)

Tanpa Kota Makassar									
2 *Cluster*				**3 *Cluster***					
$\boldsymbol{U_1}$		$\boldsymbol{U_{23}}$		$\boldsymbol{U_1}$				$\boldsymbol{U_{100}}$	
0,485	0,515	0,989	0,011	0,849	0,025	0,125	0,978	0,019	0,003
0,506	0,494	0,149	0,851	0,061	0,837	0,102	0,124	0,275	0,601
0,489	0,511	0,956	0,044	0,710	0,061	0,229	0,878	0,101	0,020
0,497	0,503	0,748	0,252	0,469	0,148	0,382	0,469	0,405	0,126
0,509	0,491	0,264	0,736	0,173	0,505	0,323	0,169	0,576	0,255
0,505	0,495	0,188	0,812	0,207	0,491	0,302	0,097	0,172	0,731
0,483	0,517	0,989	0,011	0,895	0,015	0,090	0,926	0,066	0,008
0,483	0,517	0,863	0,137	0,270	0,036	0,694	0,273	0,687	0,040
0,489	0,511	0,943	0,057	0,692	0,059	0,249	0,774	0,193	0,032
0,488	0,512	0,965	0,035	0,757	0,046	0,196	0,909	0,076	0,015
0,506	0,494	0,112	0,888	0,158	0,574	0,268	0,051	0,105	0,844
0,487	0,513	0,969	0,031	0,790	0,038	0,172	0,905	0,081	0,014
0,485	0,515	0,974	0,026	0,747	0,037	0,216	0,836	0,145	0,018
0,483	0,517	0,923	0,077	0,666	0,041	0,293	0,528	0,434	0,039
0,477	0,523	0,952	0,048	0,794	0,021	0,185	0,623	0,346	0,031
0,488	0,512	0,963	0,037	0,760	0,048	0,192	0,909	0,075	0,015
0,488	0,512	0,864	0,136	0,400	0,064	0,536	0,309	0,649	0,042
0,485	0,515	0,986	0,014	0,851	0,025	0,124	0,966	0,029	0,004
0,520	0,480	0,564	0,436	0,123	0,091	0,787	0,070	0,893	0,037
0,488	0,512	0,935	0,065	0,622	0,063	0,315	0,649	0,313	0,037
0,484	0,516	0,987	0,013	0,867	0,021	0,112	0,938	0,054	0,007
0,486	0,514	0,968	0,032	0,760	0,033	0,207	0,830	0,148	0,022
0,511	0,489	0,177	0,823	0,180	0,459	0,361	0,150	0,507	0,343

Lampiran 11 *Output* Dua *Cluster Fuzzy C-Means* pada Empat Komponen Utama

```
> summary(res.fcm)
Summary for 'res.fcm'

Number of data objects:  24

Number of clusters:  2

Crisp clustering vector:
 [1] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1 1

Initial cluster prototypes:
                PC1       PC2        PC3         PC4
Cluster 1 -0.6990988 0.4682413 -0.1936273 -0.05982403
Cluster 2 14.4789998 0.1824850  0.4526244  0.90857446

Final cluster prototypes:
                PC1         PC2         PC3         PC4
Cluster 1 -0.6744187 0.03936076 0.01824244 0.01376521
Cluster 2 13.8349186 0.10043484 0.38809069 0.78316548

Distance between the final cluster prototypes
          Cluster 1
Cluster 2  211.2534

Difference between the initial and final cluster prototypes
                PC1         PC2         PC3          PC4
Cluster 1  0.02468013 -0.42888057  0.2118697  0.07358924
Cluster 2 -0.64408115 -0.08205013 -0.0645337 -0.12540898

Root Mean Squared Deviations (RMSD): 0.5815138
Mean Absolute Deviation (MAD): 3.310187

Membership degrees matrix (top and bottom 5 rows):
  Cluster 1   Cluster 2
1 0.9945393 0.005460746
2 0.8829826 0.117017350
3 0.9950826 0.004917389
4 0.9515777 0.048422328
5 0.8643877 0.135612276
...
     Cluster 1   Cluster 2
20 0.996393002 0.003606998
21 0.992283399 0.007716601
22 0.001910465 0.998089535
23 0.998895630 0.001104370
24 0.996535408 0.003464592

Descriptive statistics for the membership degrees by clusters
          Size       Min        Q1      Mean    Median        Q3       Max
Cluster 1   23 0.8643877 0.9803076 0.9746710 0.9930492 0.9958334 0.9988956
Cluster 2    1 0.9980895 0.9980895 0.9980895 0.9980895 0.9980895 0.9980895

Dunn's Fuzziness Coefficients:
dunn_coeff normalized
 0.9553278  0.9106557

Within cluster sum of squares by cluster:
       1        2
130.6032   0.0000
(between_SS / total_SS =  60.79%)

Available components:
 [1] "u"          "v"          "v0"         "d"          "x"          "cluster"
"csize"
 [8] "sumsqrs"    "k"          "m"          "iter"       "best.start" "func.val"
"comp.time"
[15] "inpargs"    "algorithm"  "call"
> cat("Number of iterations until convergence:", res.fcm$iter, "\n")
Number of iterations until convergence: 13
```

Lampiran 12 *Output* Dua *Cluster Fuzzy C-Means* Tanpa Kota Makassar

```
Summary for 'res.fcm'

Number of data objects:  23

Number of clusters:  2

Crisp clustering vector:
 [1] 2 1 2 2 1 1 2 2 2 2 1 2 2 2 2 2 2 2 2 2 2 2 1

Initial cluster prototypes:
          PEMBUNUHAN ANIRAT ANIRA KDRT PERKOSAAN MELANGGAR KESOPANAN /
KESUSILAAN / PENCABULAN PENCULIKAN
Cluster 1          4      1   364   36          1
19          0
Cluster 2          0    181     0   20          3
7          0
          CURAS CURI BIASA CURANMOR CURAT PENGRUSAKAN PEMBAKARAN SENGAJA
NARKOBA PENIPUAN PENGGELAPAN
Cluster 1    10         300       31     6            0                  73
151      131          40
Cluster 2    21         168        8    21           20                   2
13       75          15
          KORUPSI KEJAHATAN KETERTIBA UMUM
Cluster 1       0                         0
Cluster 2       0                        41

Final cluster prototypes:
          PEMBUNUHAN    ANIRAT     ANIRA     KDRT PERKOSAAN MELANGGAR KESOPANAN
/ KESUSILAAN / PENCABULAN
Cluster 1   3.153629 13.314185 264.03121 40.61440 11.781534
14.685189
Cluster 2   1.846826  8.270498  68.61212 12.97128  3.348048
8.355442
          PENCULIKAN     CURAS CURI BIASA CURANMOR     CURAT PENGRUSAKAN
PEMBAKARAN SENGAJA  NARKOBA
Cluster 1  1.6915491 14.084866   331.9081 52.90587 58.255950    40.63434
15.3434465 61.70120
Cluster 2  0.1237718  2.224549    86.0688 14.21528  9.520093    12.14634
0.5962686 25.54578
          PENIPUAN PENGGELAPAN   KORUPSI KEJAHATAN KETERTIBA UMUM
Cluster 1 97.40488    56.29800 0.2320041                12.740234
Cluster 2 27.56124    19.52649 0.6780515                 6.958322

Distance between the final cluster prototypes
          Cluster 1
Cluster 2  112143.5

Difference between the initial and final cluster prototypes
          PEMBUNUHAN     ANIRAT     ANIRA      KDRT  PERKOSAAN
Cluster 1 -0.8463706   12.31418 -99.96879  4.614396 10.7815343
Cluster 2  1.8468262 -172.72950  68.61212 -7.028721  0.3480477
          MELANGGAR KESOPANAN / KESUSILAAN / PENCABULAN PENCULIKAN      CURAS
CURI BIASA  CURANMOR
Cluster 1                                      -4.314811  1.6915491   4.084866
31.90807 21.905874
Cluster 2                                       1.355442  0.1237718 -18.775451
-81.93120  6.215278
              CURAT PENGRUSAKAN PEMBAKARAN SENGAJA   NARKOBA  PENIPUAN
PENGGELAPAN   KORUPSI
Cluster 1  52.25595   40.634338         -57.656553 -89.29880 -33.59512
16.29800 0.2320041
Cluster 2 -11.47991   -7.853665          -1.403731  12.54578 -47.43876
4.52649 0.6780515
          KEJAHATAN KETERTIBA UMUM
Cluster 1                 12.74023
Cluster 2                -34.04168

Root Mean Squared Deviations (RMSD): 193.0565
Mean Absolute Deviation (MAD): 8766.683

Membership degrees matrix (top and bottom 5 rows):
   Cluster 1 Cluster 2
1 0.01134926 0.9886507
2 0.85132220 0.1486778
```

Lampiran 12 *Output* Dua *Cluster Fuzzy C-Means* Tanpa Kota Makassar (Lanjutan)

```
3 0.04416478 0.9558352
4 0.25242727 0.7475727
5 0.73590915 0.2640908
...
    Cluster 1 Cluster 2
19 0.43628563 0.5637144
20 0.06469881 0.9353012
21 0.01283565 0.9871643
22 0.03233528 0.9676647
23 0.82340962 0.1765904

Descriptive statistics for the membership degrees by clusters
           Size        Min        Q1      Mean    Median        Q3       Max
Cluster 1     5 0.7359092 0.8118090 0.8219955 0.8234096 0.8513222 0.8875275
Cluster 2    18 0.5637144 0.9259542 0.9186102 0.9591792 0.9729231 0.9889787

Dunn's Fuzziness Coefficients:
dunn_coeff normalized
 0.8374945  0.6749890

Within cluster sum of squares by cluster:
       1        2
156357.2 158330.7
(between_SS / total_SS =  58.24%)

> cat("Number of iterations until convergence:", res.fcm$iter, "\n")
Number of iterations until convergence: 23
```

Lampiran 13 *Output* Tiga *Cluster Fuzzy C-Means* pada Empat Komponen Utama

```
> summary(res.fcm)
Summary for 'res.fcm'

Number of data objects:  24

Number of clusters:  3

Crisp clustering vector:
 [1] 1 3 1 1 3 3 1 1 1 1 3 1 1 1 1 1 3 1 1 3 1 2 1 1

Initial cluster prototypes:
                PC1       PC2       PC3        PC4
Cluster 1 -1.229665 0.1219709 0.9102165  0.7063472
Cluster 2 14.479000 0.1824850 0.4526244  0.9085745
Cluster 3  0.940656 0.6582718 1.8609753 -4.4072964

Final cluster prototypes:
                 PC1        PC2        PC3        PC4
Cluster 1 -1.03207490  0.2410046  0.2865309  0.2399695
Cluster 2 14.33357527  0.1637174  0.4402336  0.8795548
Cluster 3  0.08729866 -0.3400741 -0.6967442 -0.5262624

Distance between the final cluster prototypes
           Cluster 1  Cluster 2
Cluster 2 236.541873
Cluster 3   3.144591 206.479243

Difference between the initial and final cluster prototypes
                PC1         PC2        PC3        PC4
Cluster 1  0.1975904  0.11903372 -0.62368560 -0.4663777
Cluster 2 -0.1454245 -0.01876761 -0.01239081 -0.0290197
Cluster 3 -0.8533573 -0.99834591 -2.55771947  3.8810340

Root Mean Squared Deviations (RMSD): 2.829103
Mean Absolute Deviation (MAD): 13.20366

Membership degrees matrix (top and bottom 5 rows):
  Cluster 1   Cluster 2  Cluster 3
1 0.9252985 0.001602931 0.07309853
2 0.4272484 0.057368414 0.51538315
3 0.9070510 0.001725035 0.09122392
4 0.5318206 0.025692060 0.44248731
5 0.3728201 0.062545758 0.56463418
...
     Cluster 1   Cluster 2  Cluster 3
20 0.324369487 0.002334053 0.67329646
21 0.898065482 0.002604982 0.09932954
22 0.000093299 0.999799991 0.00010671
23 0.781690754 0.001660410 0.21664884
24 0.595284016 0.003483101 0.40123288

Descriptive statistics for the membership degrees by clusters
          Size       Min        Q1      Mean    Median        Q3       Max
Cluster 1   17 0.5227396 0.6115772 0.7784242 0.8598461 0.8994658 0.9431205
Cluster 2    1 0.9998000 0.9998000 0.9998000 0.9998000 0.9998000 0.9998000
Cluster 3    6 0.4987947 0.5276959 0.5823144 0.5662955 0.6469615 0.6738214

Dunn's Fuzziness Coefficients:
dunn_coeff normalized
 0.6601406  0.4902110

Within cluster sum of squares by cluster:
       1        2        3
28.11829  0.00000 73.00927
(between_SS / total_SS =  69.69%)

> cat("Number of iterations until convergence:", res.fcm$iter, "\n")
Number of iterations until convergence: 69
```

Lampiran 14 *Output* Tiga *Cluster Fuzzy C-Means* Tanpa Kota Makassar

```
> summary(res.fcm)
Summary for 'res.fcm'

Number of data objects:  23

Number of clusters:  3

Crisp clustering vector:
 [1] 1 3 1 1 2 3 1 2 1 1 3 1 1 1 1 1 2 1 2 1 1 1 2

Initial cluster prototypes:
          X1 X2  X3 X4 X5 X6 X7 X8  X9 X10 X11 X12 X13 X14 X15 X16 X17 X18
Cluster 1  0  0  78  4  1  4  0  0  64  18   0  10   0   0  26  12   0   0
Cluster 2  6  8 229 51 34 14  0  3 429  21  97  65   0 135 100 109   1   4
Cluster 3  4 13 327 44  5  7  1 54 482 134 154  80   1   0   0   0   0   0

Final cluster prototypes:
                X1        X2        X3       X4        X5        X6         X7
X8        X9
Cluster 1 1.643163  5.083188  54.53674 10.49403  1.798909  7.281577 0.06918173
1.212984  72.63705
Cluster 2 2.056666 16.157698 159.27781 26.11873  7.932483 14.437431 1.37700269
5.336812 172.72343
Cluster 3 4.435419 10.209657 281.19101 44.02497 16.013878 13.052058 0.65259223
19.656822 396.93842
              X10       X11      X12        X13      X14       X15       X16
X17       X18
Cluster 1 11.51454  5.152903 11.05932  0.4123659 22.58974 23.76774 16.86709
0.6183669  6.250055
Cluster 2 29.16093 26.854632 20.50401  3.3155166 35.26883 60.68759 32.46376
0.5170033 11.470025
Cluster 3 59.43389 87.089680 52.72090 15.0848573 83.27862 80.52342 58.38665
0.3978029  4.693977

Distance between the final cluster prototypes
          Cluster 1 Cluster 2
Cluster 2  24136.80
Cluster 3 177869.37  74907.16

Difference between the initial and final cluster prototypes
                 X1        X2        X3           X4          X5        X6
X7         X8
Cluster 1  1.6431630  5.083188 -23.46326   6.49403481   0.7989087 3.2815769
0.06918173   1.212984
Cluster 2 -3.9433345  8.157698 -69.72219 -24.88126743 -26.0675172 0.4374311
1.37700269   2.336812
Cluster 3  0.4354193 -2.790343 -45.80899   0.02496759  11.0138784 6.0520581 -
0.34740777 -34.343178
                  X9        X10        X11        X12        X13        X14
X15        X16
Cluster 1    8.637055  -6.485462   5.152903   1.059317  0.4123659  22.58974  -
2.23226   4.867095
Cluster 2 -256.276572   8.160933 -70.145368 -44.495989  3.3155166 -99.73117 -
39.31241 -76.536244
Cluster 3  -85.061581 -74.566114 -66.910320 -27.279097 14.0848573  83.27862
80.52342  58.386651
                X17      X18
Cluster 1  0.6183669 6.250055
Cluster 2 -0.4829967 7.470025
Cluster 3  0.3978029 4.693977

Root Mean Squared Deviations (RMSD): 213.0549
Mean Absolute Deviation (MAD): 8635.2

Membership degrees matrix (top and bottom 5 rows):
  Cluster 1  Cluster 2   Cluster 3
1 0.9782746 0.01889602 0.002829365
2 0.1243537 0.27469482 0.600951528
3 0.8783610 0.10125850 0.020380526
4 0.4690370 0.40502147 0.125941480
5 0.1689325 0.57625893 0.254808535
...
    Cluster 1 Cluster 2   Cluster 3
19 0.06965326 0.8932510 0.037095719
```

Lampiran 14 *Output* Tiga *Cluster Fuzzy C-Means* Tanpa Kota Makassar (Lanjutan)

```
20 0.64913066 0.3134345 0.037434801
21 0.93839728 0.0544516 0.007151121
22 0.83017765 0.1481682 0.021654120
23 0.15008565 0.5073484 0.342565980

Descriptive statistics for the membership degrees by clusters
           Size       Min        Q1      Mean    Median        Q3       Max
Cluster 1   15 0.4690370 0.7116604 0.8080431 0.8783610 0.9178907 0.9782746
Cluster 2    5 0.5073484 0.5762589 0.6625394 0.6486052 0.6872335 0.8932510
Cluster 3    3 0.6009515 0.6657592 0.7251811 0.7305668 0.7872959 0.8440249

Dunn's Fuzziness Coefficients:
dunn_coeff normalized
 0.6662445  0.4993667

Within cluster sum of squares by cluster:
        1         2         3
106448.00  60106.00  85014.67
(between_SS / total_SS =  65.4%)

> cat("Number of iterations until convergence:", res.fcm$iter, "\n")
Number of iterations until convergence: 100
```