

## DAFTAR PUSTAKA

- Alata, M., Molhim, M., & Ramini, A. (2008). *Optimizing of Fuzzy C-Means Clustering Algorithm Using GA*. *International Journal of Computer and Information Engineering*, 2(3), 670–675.
- Derisma, Fridaus, & Yusya, R. P. (2016). Perancangan Ikat Pinggang Elektronik Untuk Tunanetra Menggunakan Mikrokontroler Dan *Global Positioning System* (GPS) Pada *Smartphone Android*. *Jurnal Teknik Elektro ITP*, 5(2).
- Dewi, S. N., Cholissodin, I., & Santoso, E. (2018). *Prediksi Jumlah Kriminalitas Menggunakan Metode Extreme Learning Machine (Studi Kasus Di Kabupaten Probolinggo)* (Vol. 2, Issue 11).
- Dona, F. M., & Setiawan. (2015). *Pemodelan Faktor-Faktor Yang Mempengaruhi Tingkat Kriminalitas di Jawa Timur dengan Analisis Regresi Spasial* (Vol. 4, Issue 1).
- Gudono. (2016). Analisis Data Multivariat. In *Statistik* (4th ed.).
- Handoyo, R., Ruman, M. R., & Nasution, S. M. (2014). *Perbandingan Metode Clustering Menggunakan Metode Single Linkage Dan K-Means Pada Pengelompokan Dokumen* (Vol. 15, Issue 2).
- Hennig, C. (2015). What are the true clusters? *Pattern Recognition Letters*, 64, 53–62.
- Hikmah, H., Fardinah, F., Qadrini, L., & Tande, E. (2022). Analisis Kluster Pengelompokan Kecamatan di Sulawesi Barat Berdasarkan Indikator Pendidikan. *Saintifik*, 8(2), 188–196.
- Jacobson, D., Mason, G. A., & Jacobson, R. D. (2007). *Fuzzy Geographically Weighted Clustering Community health analysis View project User Generated Geospatial Data View project Fuzzy Geographically Weighted Clustering*.
- Jaya, T. S., Adi, K., & Noranita, B. (2014). Sistem Pemilihan Perumahan dengan Metode Kombinasi *Fuzzy C-Means Clustering* dan *Simple Additive Weighting*. *Jurnal Sistem Informasi Bisnis*, 1(3).
- Johnson, R. A., & Wichern, D. W. (2007). *Applied Multivariate Statistical Analysis*.: *Pearson Prentice Hall*. In *Pearson Prentice Hall*.
- Mantik, J., Hartama, D., & Anjelita, M. (2022). *Analysis of Silhouette Coefficient Evaluation with Euclidean Distance in the Clustering Method (Case Study: Number of Public Schools in Indonesia)*. In *Journal Mantik* (Vol. 6, Issue 3). Online.
- Mashfufah, S., Nur, I. M., & Darsyah, M. Y. (2021). *Fuzzy Geographically Weighted Clustering dengan Gravitational Search Algorithm pada Kasus Penyandang Masalah Kesejahteraan Sosial di Provinsi Jawa Tengah*. *Jurnal Litbang Edusaintech*, 2(1), 27–36.
- Miftahuddin, Y., Umaroh, S., & Karim, F. R. (2020). Perbandingan Metode Perhitungan Jarak Euclidean, Haversine, dan Manhattan dalam Penentuan Posisi Karyawan (Studi Kasus: Institut Teknologi Nasional Bandung). *Jurnal Tekno Insentif*, 14(2).
- Mustofa, Z., & Iman Saufik Suasana. (2020). Algoritma Clustering K-Medoids pada *E-Government Bidang Information and Communication Technology* dalam Penentuan Status EDGI. *Jurnal Teknologi Informasi dan Komunikasi*, 9(1).

- Pramana, S., & Pamungkas, I. H. (2018). *Improvement Method of Fuzzy Geographically Weighted Clustering using Gravitational Search Algorithm*. *Jurnal Ilmu Komputer Dan Informasi*, 11(1), 10.
- Pramesti, D. F. (2008). Implementasi Metode *K-Medoids Clustering* Untuk Pengelompokan Data Potensi Kebakaran Hutan/Lahan Berdasarkan Persebaran Titik Panas (Hotspot). *Proceedings of the 38th European Microwave Conference, EuMC 2008*, 1(9).
- Sarle, W. S., Kaufman, L., & Rousseeuw, P. J. (1991). *Finding Groups in Data: An Introduction to Cluster Analysis*. *Journal of the American Statistical Association*, 86(415).
- Sihombing, P. R., Suryadiningrat, S., Sunarjo, D. A., & Yuda, Y. P. A. C. (2023). Identifikasi Data Outlier (Pencilan) dan Kenormalan Data Pada Data Univariat serta Alternatif Penyelesaiannya. *Jurnal Ekonomi Dan Statistik Indonesia*, 2(3), 307–316.
- Widyadhana, D., Hastuti, R. B., Kharisudin, I., & Fauzi, F. (2021). Perbandingan Analisis Kluster K-Means dan Average Linkage untuk Pengklasteran Kemiskinan di Provinsi Jawa Tengah. *PRISMA, Prosiding Seminar Nasional Matematika*, 4.

# LAMPIRAN

**Lampiran 1. Data Kriminalitas Provinsi Sulawesi Selatan Tahun 2022**

<b>Kabupaten/Kota</b>	$X_1$	$X_2$	$X_3$	$X_4$	$X_5$	$X_6$	$X_7$	$X_8$	$X_9$	$X_{10}$	$X_{11}$	$X_{12}$	$X_{13}$	$X_{14}$	<b>Jumlah Populasi</b>
Bantaeng	1	2	40	3	0	6	0	15	1	3	2	54	4	7	199399
Barru	1	0	0	7	1	8	0	59	12	17	5	31	20	13	186910
Bone	6	8	229	51	34	14	3	429	21	97	65	135	100	109	813188
Bulukumba	4	1	364	36	1	19	10	300	31	6	0	151	131	40	443292
Enrekang	0	0	10	3	0	2	0	52	0	0	12	0	8	2	230622
Gowa	4	13	327	44	5	7	54	482	134	154	80	0	0	0	783167
Jeneponto	0	181	0	20	3	7	21	168	8	21	20	13	75	15	410639
Kepulauan Selayar	1	1	56	6	1	8	0	61	7	0	9	14	20	3	139145
Kota Makassar	10	23	1265	161	11	34	236	2091	466	977	322	373	1093	395	1432189
Kota Palopo	1	1	201	23	8	12	5	274	65	31	40	0	152	81	190867
Kota Parepare	1	1	36	27	0	15	3	111	6	2	14	58	15	41	154854
Luwu	2	2	158	23	37	15	1	101	20	48	23	33	42	21	369820
Luwu Timur	0	1	141	21	4	21	1	56	12	6	7	48	10	7	305521
Luwu Utara	0	1	180	22	0	17	2	198	16	24	20	51	40	18	327820
Maros	8	7	117	25	1	15	12	145	52	44	15	63	29	19	403774
Pangkajene dan Kepulauan	0	4	70	2	0	3	3	58	12	17	7	28	13	11	351426
Pinrang	4	0	74	16	5	4	3	142	20	0	13	0	45	17	411795
Sidenreng Rappang	0	6	100	11	1	2	0	117	16	4	12	0	54	81	327416
Sinjai	7	2	73	14	0	3	0	87	17	0	17	0	13	8	263827
Soppeng	2	1	11	9	2	7	0	67	21	6	17	16	49	35	236049
Takalar	1	39	261	61	12	23	3	215	36	9	25	0	129	61	305077
Tana Toraja	1	1	55	3	3	4	0	58	11	2	15	0	23	18	291046
Toraja Utara	0	0	78	4	1	4	0	64	18	0	10	0	26	12	268198
Wajo	4	0	79	25	4	16	1	74	6	0	6	73	28	20	379706

## Lampiran 2. Evaluasi Z-score

Kab/Kot	$X_1$	$X_2$	$X_3$	$X_4$	$X_5$	$X_6$	$X_7$	$X_8$	$X_9$	$X_{10}$	$X_{11}$	$X_{12}$	$X_{13}$	$X_{14}$
1	-0,49573	-0,33193	-0,64104	-0,57018	-0,46696	-0,38388	-0,30775	-0,40244	-0,31737	-0,22267	-0,41002	-0,20494	-0,31296	-0,37543
2	1,253905	-0,1159	0,256581	0,770828	2,895133	0,363127	-0,24586	0,489194	-0,22216	0,180657	0,518329	1,083527	0,053656	0,822619
3	0,554051	-0,30493	0,785749	0,313665	-0,46696	0,98563	-0,10144	0,178327	-0,11637	-0,27813	-0,48738	1,281752	0,19572	-0,03848
4	-0,84566	-0,33193	-0,60185	-0,69209	-0,56884	-1,13088	-0,30775	-0,41931	-0,44432	-0,30838	-0,30171	-0,589	-0,36795	-0,51271
5	0,554051	0,019128	0,640718	0,557485	-0,05943	-0,50838	0,806348	0,616914	0,973279	0,468029	0,750417	-0,589	-0,40462	-0,53767
6	-0,84566	4,555927	-0,64104	-0,17398	-0,26319	-0,50838	0,125508	-0,13977	-0,35969	-0,2025	-0,17793	-0,42794	-0,06091	-0,35047
7	-0,49573	-0,30493	-0,42154	-0,60066	-0,46696	-0,38388	-0,30775	-0,39762	-0,37027	-0,30838	-0,34813	-0,41555	-0,31296	-0,50023
8	2,653614	0,289176	4,317455	4,12336	0,551858	2,853138	4,561283	4,494316	4,485547	4,617267	4,494766	4,032124	4,604297	4,391806
9	-0,49573	-0,30493	0,146828	-0,08254	0,246214	0,114126	-0,2046	0,115671	0,24332	-0,15209	0,131516	-0,589	0,291957	0,473188
10	-0,49573	-0,30493	-0,49993	0,039367	-0,56884	0,487627	-0,24586	-0,27713	-0,38085	-0,29829	-0,27077	0,129569	-0,33588	-0,026
11	-0,1458	-0,27792	-0,02172	-0,08254	3,200777	0,487627	-0,28712	-0,30123	-0,23274	-0,06638	-0,13152	-0,18016	-0,21214	-0,27559
12	-0,84566	-0,30493	-0,08836	-0,1435	-0,16131	1,234631	-0,28712	-0,40967	-0,31737	-0,27813	-0,37908	0,005678	-0,35879	-0,45031
13	-0,84566	-0,30493	0,064513	-0,11302	-0,56884	0,736628	-0,26649	-0,06747	-0,27506	-0,18738	-0,17793	0,042846	-0,22131	-0,31303
14	1,95376	-0,1429	-0,18243	-0,02159	-0,46696	0,487627	-0,06018	-0,1952	0,105791	-0,08655	-0,2553	0,191514	-0,27172	-0,30055
15	-0,84566	-0,22391	-0,36666	-0,72257	-0,56884	-1,00638	-0,24586	-0,40485	-0,31737	-0,22267	-0,37908	-0,2421	-0,34504	-0,40039
16	0,554051	-0,33193	-0,35098	-0,29589	-0,05943	-0,88188	-0,24586	-0,20242	-0,23274	-0,30838	-0,28624	-0,589	-0,19839	-0,32551
17	-0,84566	-0,1699	-0,24907	-0,44827	-0,46696	-1,13088	-0,30775	-0,26267	-0,27506	-0,28821	-0,30171	-0,589	-0,15715	0,473188
18	1,603833	-0,27792	-0,3549	-0,35684	-0,56884	-1,00638	-0,30775	-0,33497	-0,26448	-0,30838	-0,22435	-0,589	-0,34504	-0,43783
19	-0,1458	-0,30493	-0,59793	-0,50923	-0,36508	-0,50838	-0,30775	-0,38316	-0,22216	-0,27813	-0,22435	-0,39077	-0,18006	-0,10088
20	-0,49573	0,721252	0,382013	1,075604	0,65374	1,483632	-0,24586	-0,02651	-0,06347	-0,263	-0,10057	-0,589	0,186555	0,223594
21	-0,49573	-0,30493	-0,42546	-0,69209	-0,26319	-0,88188	-0,30775	-0,40485	-0,32795	-0,29829	-0,2553	-0,589	-0,29921	-0,31303
22	-0,84566	-0,33193	-0,3353	-0,66162	-0,46696	-0,88188	-0,30775	-0,39039	-0,2539	-0,30838	-0,33266	-0,589	-0,28547	-0,38791
23	0,554051	-0,33193	-0,33138	-0,02159	-0,16131	0,612128	-0,28712	-0,36629	-0,38085	-0,30838	-0,39455	0,315405	-0,2763	-0,28807
24	-0,84566	-0,33193	-0,64104	-0,78353	-0,56884	-1,37988	-0,30775	-0,54462	-0,44432	-0,30838	-0,48738	-0,589	-0,40462	-0,53767

**Lampiran 3. Matriks Jarak Data**

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
0	0,000	1,087	0,806	0,255	1,988	0,322	0,299	1,297	2,513	1,495	2,298	3,155	3,098	0,554	0,807	1,905	1,681	0,316	1,153	0,521	2,395	2,603	1,493
1	1,087	0,000	0,504	1,129	0,955	0,868	1,126	2,353	1,530	0,414	1,336	2,380	2,099	0,560	0,388	0,825	0,692	0,886	0,223	1,003	1,333	1,563	0,646
2	0,806	0,504	0,000	0,745	1,219	0,739	0,973	1,957	1,714	0,814	1,497	2,370	2,300	0,507	0,583	1,196	0,902	0,515	0,428	0,980	1,640	1,825	0,690
3	0,255	1,129	0,745	0,000	1,963	0,532	0,554	1,227	2,454	1,516	2,235	3,020	3,038	0,669	0,924	1,919	1,647	0,244	1,146	0,766	2,382	2,571	1,427
4	1,988	0,955	1,219	1,963	0,000	1,812	2,071	3,172	0,592	0,566	0,435	1,585	1,146	1,504	1,339	0,297	0,319	1,726	0,836	1,958	0,426	0,616	0,585
5	0,322	0,868	0,739	0,532	1,812	0,000	0,259	1,601	2,368	1,281	2,161	3,103	2,948	0,309	0,529	1,691	1,523	0,429	0,986	0,272	2,201	2,426	1,379
6	0,299	1,126	0,973	0,554	2,071	0,259	0,000	1,422	2,626	1,539	2,418	3,343	3,206	0,567	0,775	1,948	1,781	0,565	1,244	0,272	2,459	2,685	1,631
7	1,297	2,353	1,957	1,227	3,172	1,601	1,422	0,000	3,626	2,743	3,405	4,033	4,204	1,849	2,104	3,144	2,853	1,471	2,370	1,689	3,596	3,770	2,613
8	2,513	1,530	1,714	2,454	0,592	2,368	2,626	3,626	0,000	1,156	0,221	1,080	0,586	2,064	1,918	0,844	0,845	2,229	1,382	2,532	0,454	0,294	1,026
9	1,495	0,414	0,814	1,516	0,566	1,281	1,539	2,743	1,156	0,000	0,981	2,090	1,709	0,973	0,783	0,412	0,381	1,272	0,386	1,403	0,922	1,160	0,510
10	2,298	1,336	1,497	2,235	0,435	2,161	2,418	3,405	0,221	0,981	0,000	1,155	0,804	1,859	1,724	0,721	0,644	2,012	1,177	2,333	0,479	0,441	0,808
11	3,155	2,380	2,370	3,020	1,585	3,103	3,343	4,033	1,080	2,090	1,155	0,000	0,990	2,829	2,754	1,875	1,715	2,842	2,180	3,319	1,531	1,314	1,748
12	3,098	2,099	2,300	3,038	1,146	2,948	3,206	4,204	0,586	1,709	0,804	0,990	0,000	2,642	2,485	1,350	1,425	2,815	1,963	3,103	0,843	0,573	1,612
13	0,554	0,560	0,507	0,669	1,504	0,309	0,567	1,849	2,064	0,973	1,859	2,829	2,642	0,000	0,258	1,384	1,219	0,461	0,682	0,490	1,892	2,117	1,090
14	0,807	0,388	0,583	0,924	1,339	0,529	0,775	2,104	1,918	0,783	1,724	2,754	2,485	0,258	0,000	1,183	1,080	0,706	0,574	0,621	1,704	1,942	1,007
15	1,905	0,825	1,196	1,919	0,297	1,691	1,948	3,144	0,844	0,412	0,721	1,875	1,350	1,384	1,183	0,000	0,415	1,675	0,774	1,802	0,526	0,782	0,688
16	1,681	0,692	0,902	1,647	0,319	1,523	1,781	2,853	0,845	0,381	0,644	1,715	1,425	1,219	1,080	0,415	0,000	1,412	0,538	1,688	0,745	0,925	0,282
17	0,316	0,886	0,515	0,244	1,726	0,429	0,565	1,471	2,229	1,272	2,012	2,842	2,815	0,461	0,706	1,675	1,412	0,000	0,904	0,698	2,143	2,337	1,204
18	1,153	0,223	0,428	1,146	0,836	0,986	1,244	2,370	1,382	0,386	1,177	2,180	1,963	0,682	0,574	0,774	0,538	0,904	0,000	1,160	1,244	1,451	0,434
19	0,521	1,003	0,980	0,766	1,958	0,272	0,272	1,689	2,532	1,403	2,333	3,319	3,103	0,490	0,621	1,802	1,688	0,698	1,160	0,000	2,324	2,563	1,577
20	2,395	1,333	1,640	2,382	0,426	2,201	2,459	3,596	0,454	0,922	0,479	1,531	0,843	1,892	1,704	0,526	0,745	2,143	1,244	2,324	0,000	0,270	1,008
21	2,603	1,563	1,825	2,571	0,616	2,426	2,685	3,770	0,294	1,160	0,441	1,314	0,573	2,117	1,942	0,782	0,925	2,337	1,451	2,563	0,270	0,000	1,158
22	1,493	0,646	0,690	1,427	0,585	1,379	1,631	2,613	1,026	0,510	0,808	1,748	1,612	1,090	1,007	0,688	0,282	1,204	0,434	1,577	1,008	1,158	0,000

### Lampiran 4. Matriks Pembobot Geografis

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
0	0	3,4E+1 4	2,0E+1 6	3,5E+1 5	2,3E+1 6	4,8E+1 5	2,7E+1 5	2,1E+1 6	1,5E+1 6	2,1E+1 5	3,2E+1 5	1,9E+1 5	2,1E+1 6	1,5E+1 6	8,7E+1 5	4,3E+1 6	3,9E+1 5	1,7E+1 5	4,1E+1 5	1,2E+1 6	2,4E+1 5	2,1E+1 6	5,1E+1 5
1	3,4E+1 4	0	3,0E+1 5	7,3E+1 5	4,5E+1 6	1,7E+1 6	6,8E+1 5	1,1E+1 6	2,3E+1 5	7,0E+1 5	5,2E+1 3	2,4E+1 6	2,9E+1 6	1,3E+1 5	1,7E+1 6	9,3E+1 5	8,8E+1 5	5,6E+1 5	2,0E+1 6	5,7E+1 4	4,1E+1 6	3,2E+1 6	1,1E+1 6
2	2,0E+1 6	3,0E+1 5	0	4,8E+1 6	1,5E+1 5	8,6E+1 5	3,4E+1 5	5,8E+1 5	9,1E+1 5	1,5E+1 6	2,0E+1 6	1,0E+1 6	1,2E+1 6	6,5E+1 5	4,9E+1 5	2,8E+1 5	3,0E+1 6	4,2E+1 5	4,5E+1 5	2,5E+1 6	1,4E+1 6	1,2E+1 5	4,5E+1 4
3	3,5E+1 5	7,3E+1 5	4,8E+1 6	0	5,2E+1 5	6,5E+1 5	3,3E+1 5	5,0E+1 5	3,4E+1 6	4,5E+1 6	7,3E+1 5	4,5E+1 5	4,8E+1 6	2,7E+1 6	1,7E+1 6	9,5E+1 5	8,8E+1 5	4,8E+1 5	9,1E+1 5	1,8E+1 5	5,4E+1 5	4,6E+1 5	1,2E+1 6
4	2,3E+1 6	4,5E+1 6	1,5E+1 5	5,2E+1 5	0	1,0E+1 6	4,6E+1 5	1,0E+1 6	7,4E+1 4	6,3E+1 5	2,0E+1 6	4,4E+1 5	6,6E+1 4	6,2E+1 6	6,1E+1 5	3,2E+1 6	2,4E+1 5	3,5E+1 5	6,5E+1 5	3,6E+1 5	1,6E+1 6	1,0E+1 6	1,5E+1 6
5	4,8E+1 5	1,7E+1 6	8,6E+1 5	6,5E+1 5	1,0E+1 6	0	1,2E+1 6	6,8E+1 6	6,3E+1 6	9,5E+1 5	1,3E+1 5	7,7E+1 4	8,7E+1 4	1,0E+1 6	5,2E+1 5	1,9E+1 5	1,7E+1 6	4,8E+1 4	1,9E+1 6	8,8E+1 5	1,0E+1 6	8,7E+1 5	2,2E+1 6
6	2,7E+1 5	6,8E+1 5	3,4E+1 5	3,3E+1 5	4,6E+1 5	1,2E+1 6	0	4,0E+1 6	3,0E+1 6	4,1E+1 5	6,3E+1 5	3,8E+1 5	4,2E+1 5	2,9E+1 6	1,9E+1 5	8,7E+1 5	7,5E+1 5	1,9E+1 6	7,8E+1 3	4,6E+1 6	4,9E+1 6	4,1E+1 6	9,6E+1 5
7	2,1E+1 6	1,1E+1 6	5,8E+1 5	5,0E+1 5	1,0E+1 6	6,8E+1 6	4,0E+1 6	0	7,3E+1 5	7,9E+1 5	1,5E+1 6	1,1E+1 6	1,1E+1 6	3,0E+1 6	2,3E+1 6	1,8E+1 6	1,6E+1 5	2,5E+1 5	1,4E+1 5	2,5E+1 6	1,1E+1 6	9,9E+1 5	2,0E+1 6
8	1,5E+1 6	2,3E+1 5	9,1E+1 5	3,4E+1 6	7,4E+1 4	6,3E+1 6	3,0E+1 6	7,3E+1 5	0	2,6E+1 4	3,2E+1 6	5,4E+1 3	1,1E+1 6	3,7E+1 5	3,5E+1 5	9,3E+1 5	7,4E+1 5	2,3E+1 5	3,3E+1 5	2,3E+1 6	1,2E+1 6	1,7E+1 5	7,1E+1 5
9	2,1E+1 5	7,0E+1 5	1,5E+1 6	4,5E+1 6	6,3E+1 5	9,5E+1 5	4,1E+1 5	7,9E+1 5	2,6E+1 4	0	5,8E+1 5	2,3E+1 5	3,0E+1 6	6,4E+1 6	7,0E+1 5	1,5E+1 6	1,3E+1 6	3,2E+1 5	9,5E+1 5	3,4E+1 5	4,9E+1 5	3,6E+1 5	1,2E+1 6
10	3,2E+1 5	5,2E+1 3	2,0E+1 6	7,3E+1 5	2,0E+1 6	1,3E+1 5	6,3E+1 5	1,5E+1 6	3,2E+1 6	5,8E+1 5	0	9,8E+1 5	1,5E+1 5	8,0E+1 5	7,5E+1 5	2,1E+1 5	1,9E+1 6	4,8E+1 5	7,4E+1 4	4,8E+1 5	2,2E+1 4	2,2E+1 6	1,7E+1 6
11	1,9E+1 5	2,1E+1 6	1,5E+1 6	8,7E+1 5	4,3E+1 6	3,9E+1 5	1,7E+1 5	4,1E+1 5	1,2E+1 6	2,4E+1 5	1,0E+1 6	1,1E+1 6	1,1E+1 6	3,0E+1 6	2,3E+1 6	1,8E+1 6	1,6E+1 5	2,5E+1 5	1,4E+1 5	2,5E+1 6	1,1E+1 6	9,9E+1 5	2,0E+1 6
12	2,1E+1 6	2,9E+1 6	3,0E+1 5	7,3E+1 5	4,5E+1 6	1,7E+1 6	6,8E+1 5	1,1E+1 6	2,3E+1 5	7,0E+1 5	7,5E+1 5	3,9E+1 6	4,6E+1 6	5,5E+1 5	0	1,2E+1 6	1,1E+1 6	1,3E+1 6	1,4E+1 5	1,7E+1 6	6,0E+1 5	4,9E+1 5	1,3E+1 6
13	1,5E+1 6	4,3E+1 6	3,9E+1 5	9,3E+1 5	8,8E+1 5	5,6E+1 5	2,0E+1 6	4,5E+1 5	2,8E+1 6	1,3E+1 5	1,7E+1 6	1,3E+1 6	1,2E+1 6	1,2E+1 6	0	3,2E+1 5	6,5E+1 5	1,3E+1 5	7,0E+1 5	5,9E+1 5	3,6E+1 6	1,4E+1 5	8,8E+1 4
14	8,7E+1 5	9,3E+1 5	8,8E+1 5	5,6E+1 5	2,0E+1 6	5,7E+1 4	4,8E+1 5	9,1E+1 5	1,5E+1 6	2,0E+1 6	4,4E+1 5	6,6E+1 4	6,2E+1 6	6,1E+1 5	3,2E+1 6	2,4E+1 5	3,5E+1 5	6,5E+1 5	3,6E+1 5	1,6E+1 6	1,0E+1 6	8,7E+1 5	2,2E+1 6
15	4,3E+1 6	9,3E+1 5	8,8E+1 5	5,6E+1 5	2,0E+1 6	5,7E+1 4	4,8E+1 5	9,1E+1 5	1,5E+1 6	2,0E+1 6	4,4E+1 5	6,6E+1 4	6,2E+1 6	6,1E+1 5	3,2E+1 6	2,4E+1 5	3,5E+1 5	6,5E+1 5	3,6E+1 5	1,6E+1 6	1,0E+1 6	8,7E+1 5	2,2E+1 6
16	3,9E+1 5	1,7E+1 5	4,1E+1 5	1,2E+1 6	2,4E+1 5	2,1E+1 6	5,1E+1 5	4,9E+1 5	1,4E+1 5	8,8E+1 5	1,0E+1 6	8,8E+1 5	1,0E+1 6	5,2E+1 5	1,9E+1 5	1,7E+1 6	4,8E+1 4	1,9E+1 6	8,8E+1 5	1,0E+1 6	8,7E+1 5	2,2E+1 6	1,7E+1 6
17	1,7E+1 5	4,1E+1 5	1,2E+1 6	2,4E+1 5	2,1E+1 6	5,1E+1 5	4,9E+1 5	1,4E+1 5	8,8E+1 5	1,0E+1 6	8,8E+1 5	1,0E+1 6	5,2E+1 5	1,9E+1 5	1,7E+1 6	4,8E+1 4	1,9E+1 6	8,8E+1 5	1,0E+1 6	8,7E+1 5	2,2E+1 6	1,7E+1 6	7,1E+1 5
18	4,1E+1 5	1,2E+1 6	2,4E+1 5	2,1E+1 6	5,1E+1 5	4,9E+1 5	1,4E+1 5	8,8E+1 5	1,0E+1 6	8,8E+1 5	1,0E+1 6	5,2E+1 5	1,9E+1 5	1,7E+1 6	4,8E+1 4	1,9E+1 6	8,8E+1 5	1,0E+1 6	8,7E+1 5	2,2E+1 6	1,7E+1 6	7,1E+1 5	5,1E+1 5
19	1,2E+1 6	2,4E+1 5	2,1E+1 6	5,1E+1 5	4,9E+1 5	1,4E+1 5	8,8E+1 5	1,0E+1 6	8,8E+1 5	1,0E+1 6	5,2E+1 5	1,9E+1 5	1,7E+1 6	4,8E+1 4	1,9E+1 6	8,8E+1 5	1,0E+1 6	8,7E+1 5	2,2E+1 6	1,7E+1 6	7,1E+1 5	5,1E+1 5	4,4E+1 4
20	2,4E+1 5	4,1E+1 6	3,2E+1 6	1,1E+1 6	9,6E+1 5	2,0E+1 6	7,1E+1 5	1,2E+1 6	1,7E+1 6	4,9E+1 5	2,2E+1 6	6,2E+1 6	1,5E+1 6	1,0E+1 6	3,2E+1 6	2,4E+1 5	3,5E+1 5	6,5E+1 5	3,6E+1 5	1,6E+1 6	1,0E+1 6	8,7E+1 5	2,2E+1 6
21	2,1E+1 6	3,2E+1 6	1,1E+1 6	9,6E+1 5	2,0E+1 6	7,1E+1 5	1,2E+1 6	1,7E+1 6	4,9E+1 5	2,2E+1 6	6,2E+1 6	1,5E+1 6	1,0E+1 6	3,2E+1 6	2,4E+1 5	3,5E+1 5	6,5E+1 5	3,6E+1 5	1,6E+1 6	1,0E+1 6	8,7E+1 5	2,2E+1 6	1,7E+1 6
22	5,1E+1 5	1,1E+1 6	4,5E+1 4	1,2E+1 6	1,5E+1 6	2,2E+1 6	9,6E+1 5	2,0E+1 6	7,1E+1 5	1,2E+1 6	1,7E+1 6	6,6E+1 6	7,7E+1 5	1,4E+1 6	1,3E+1 6	2,3E+1 6	4,4E+1 5	8,3E+1 5	2,1E+1 4	7,3E+1 4	1,1E+1 6	8,8E+1 4	0

**Lampiran 5. Hasil Pembobotan Matriks Keanggotaan**

<b>Kabupaten/Kota</b>	<b>Klaster 1</b>	<b>Klaster 2</b>
Bantaeng	0.22029211	0.77970789
Barru	0.20099866	0.79900134
Bone	0.43214799	0.56785201
Bulukumba	0.56769336	0.43230664
Enrekang	0.58727339	0.41272661
Gowa	0.13086049	0.86913951
Jeneponto	0.69141408	0.30858592
Kepulauan Selayar	0.72363626	0.27636374
Kota Palopo	0.569942	0.430058
Kota Parepare	0.50188621	0.49811379
Luwu	0.66324262	0.33675738
Luwu Timur	0.51734085	0.48265915
Luwu Utara	0.66572358	0.33427642
Maros	0.16989282	0.83010718
Pangkajene dan Kepulauan	0.78226123	0.21773877
Pinrang	0.13696703	0.86303297
Sidenreng Rappang	0.45931472	0.54068528
Sinjai	0.07289528	0.92710472
Soppeng	0.03949335	0.96050665
Takalar	0.38931287	0.61068713
Tana Toraja	0.26244379	0.73755621
Toraja Utara	0.47878749	0.52121251
Wajo	0.04390731	0.95609269



**Lampiran 6. Pusat Klaster Iterasi Awal**

<b>Variabel</b>	<b>Klaster 1</b>	<b>Klaster 2</b>
1	1,02062292	3,04313848
2	20,17931293	6,02135935
3	118,0210601	106,1419566
4	18,10995383	19,9519071
5	6,23738541	4,16066416
6	10,48770788	9,32769552
7	4,26766353	6,43916076
8	139,7880213	142,048621
9	17,74091175	28,01986289
10	18,2370819	23,55027284
11	16,80510196	19,95395558
12	34,87109336	30,62144949
13	50,08612332	36,68306795
14	27,36678136	24,62691856

**Lampiran 7. Jarak Data Terbaru**

<b>Kabupaten/Kota</b>	<b>Klaster 1</b>	<b>Klaster 2</b>
Bantaeng	404,2589628	90,23692987
Barru	389,8882691	77,43091396
Bone	154,5436095	424,3931758
Bulukumba	161,4451357	399,873005
Enrekang	399,1344369	81,80689513
Gowa	256,1398716	516,8406566
Jeneponto	357,3102981	210,3908379
Kepulauan Selayar	359,5114733	40,38828686
Kota Palopo	121,4147709	275,4957789
Kota Parepare	329,1095777	61,53476402
Luwu	260,2432246	105,7377242
Luwu Timur	319,4713486	86,05252625
Luwu Utara	174,4953758	160,36236
Maros	243,9071319	99,36880492
Pangkajene dan Kepulauan	350,6148512	37,84233961
Pinrang	285,1387316	64,73381027
Sidenreng Rappang	283,8829742	83,69970738
Sinjai	331,91585	35,54070921
Soppeng	371,3272528	69,06210677
Takalar	144,0663859	264,0468499
Tana Toraja	360,9787901	44,89729045
Toraja Utara	344,032779	40,43193648
Wajo	328,9532691	54,75392165

**Lampiran 8. Nilai *force***

<b>Index</b>	$f_{i,1}$	$f_{i,2}$
1	0	0
2	0,022974354	-0,022974354
3	-0,022830888	0,022830888
4	-0,00014382	0,00014382
5	$3,55 \times 10^{-7}$	$-3,55 \times 10^{-7}$
6	$-5,40 \times 10^{-10}$	$5,40 \times 10^{-10}$
7	$8,86 \times 10^{-12}$	$-8,86 \times 10^{-12}$
8	$2,09 \times 10^{-13}$	$-2,09 \times 10^{-13}$
9	$-7,68 \times 10^{-16}$	$7,68 \times 10^{-16}$
10	$4,78 \times 10^{-18}$	$-4,78 \times 10^{-18}$
11	$4,36 \times 10^{-21}$	$-4,36 \times 10^{-21}$

**Lampiran 9. Nilai Force**

<b>Index</b>	$F[i, 1]$	$F[i, 2]$
1	0	0
2	0,02297435	-0,02297435
3	-0,02283089	0,02283089
4	-0,00014382	0,00014382
5	0,00000035	-0,00000035
6	0	-0
7	0	-0
8	0	-0
9	-0	0
10	0	-0
11	0	-0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0

**Lampiran 10. Nilai Acceleration**

Index	$a_{i,1}$	$a_{i,2}$
1	0	0
2	0,00068049	-0,00068049
3	-0,00065526	0,00065526
4	-0,00000362	0,00000362
5	0,00000001	-0,00000001
6	0	0
7	0	-0
8	0	-0
9	-0	0
10	0	-0
11	0	-0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0

**Lampiran 11. Nilai Velocity**

Index	$v_{i,1}$	$v_{i,2}$
1	0	0
2	0,00313625	-0,00313625
3	-0,00302041	0,00302041
4	-0,00001628	0,00001628
5	0,00000003	-0,00000003
6	0	0
7	0	-0
8	0	-0
9	-0	0
10	0	-0
11	0	-0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0

**Lampiran 12. Matriks Keanggotaan Yang Diperbarui**

<b>Kabupaten/Kota</b>	<b>Klaster 1</b>	<b>Klaster 2</b>
Bantaeng	0,04909856	0,95090144
Barru	0,03938191	0,96061809
Bone	0,87418019	0,12581981
Bulukumba	0,85905306	0,14094694
Enrekang	0,04184288	0,95815712
Gowa	0,79827064	0,20172936
Jeneponto	0,26154362	0,73845638
Kepulauan Selayar	0,01314782	0,98685218
Kota Palopo	0,84606707	0,15393293
Kota Parepare	0,03467434	0,96532566
Luwu	0,14583631	0,85416369
Luwu Timur	0,06957309	0,93042691
Luwu Utara	0,47093992	0,52906008
Maros	0,14607168	0,85392832
Pangkajene dan Kepulauan	0,01208105	0,98791895
Pinrang	0,05026113	0,94973887
Sidenreng Rappang	0,0821522	0,9178478
Sinjai	0,01174603	0,98825397
Soppeng	0,03475471	0,96524529
Takalar	0,78447697	0,21552303
Tana Toraja	0,0160041	0,9839959
Toraja Utara	0,01423069	0,98576931
Wajo	0,02773025	0,97226975

**Lampiran 13. Hasil Pembobotan Kembali Matriks Keanggotaan**

<b>Kabupaten/Kota</b>	<b>Klaster 1</b>	<b>Klaster 2</b>
Bantaeng	0,09307214	0,90692786
Barru	0,06832871	0,93167129
Bone	0,81352041	0,18647959
Bulukumba	0,80785878	0,19214122
Enrekang	0,06084124	0,93915876
Gowa	0,75249841	0,24750159
Jeneponto	0,28589283	0,71410717
Kepulauan Selayar	0,05219862	0,94780138
Kota Palopo	0,78211935	0,21788065
Kota Parepare	0,05778017	0,94221983
Luwu	0,1610026	0,8389974
Luwu Timur	0,09432762	0,90567238
Luwu Utara	0,45009534	0,54990466
Maros	0,17577323	0,82422677
Pangkajene dan Kepulauan	0,0504491	0,9495509
Pinrang	0,07057274	0,92942726
Sidenreng Rappang	0,09853921	0,90146079
Sinjai	0,06015789	0,93984211
Soppeng	0,06534072	0,93465928
Takalar	0,74886727	0,25113273
Tana Toraja	0,03962951	0,96037049
Toraja Utara	0,04114478	0,95885522
Wajo	0,05520835	0,94479165



**Lampiran 14.** Matriks Keanggotaan Dengan Pengaruh *Velocity*

<b>Kabupaten/Kota</b>	<b>Klaster 1</b>	<b>Klaster 2</b>
Bantaeng	0,09307214	0,90692786
Barru	0,07146497	0,92853503
Bone	0,8105	0,1895
Bulukumba	0,8078425	0,1921575
Enrekang	0,06084127	0,93915873
Gowa	0,75249841	0,24750159
Jeneponto	0,28589283	0,71410717
Kepulauan Selayar	0,05219862	0,94780138
Kota Palopo	0,78211935	0,21788065
Kota Parepare	0,05778017	0,94221983
Luwu	0,1610026	0,8389974
Luwu Timur	0,09432762	0,90567238
Luwu Utara	0,45009534	0,54990466
Maros	0,17577323	0,82422677
Pangkajene dan Kepulauan	0,0504491	0,9495509
Pinrang	0,07057274	0,92942726
Sidenreng Rappang	0,09853921	0,90146079
Sinjai	0,06015789	0,93984211
Soppeng	0,06534072	0,93465928
Takalar	0,74886727	0,25113273
Tana Toraja	0,03962951	0,96037049
Toraja Utara	0,04114478	0,95885522
Wajo	0,05520835	0,94479165

**Lampiran 15.** Hasil *Silhouette Coefficient* Tahap  $a(i)$ ,  $b(i)$  dan  $s(i)$

<b>Index</b>	$a(i)$	$b(i)$	$s(i)$
1	0,092	0,972	0,9053
2	0,0848	1,0025	0,9154
3	0,0533	0,9904	0,9462
4	0,0505	0,9866	0,9489
5	0,0854	1,0176	0,916
6	0,0518	0,9084	0,9429
7	0,2904	0,6993	0,5847
8	0,0911	1,0298	0,9116
9	0,0414	0,9502	0,9565
10	0,0868	1,0219	0,915
11	0,1474	0,8759	0,8317
12	0,0927	0,9702	0,9045
13	0,509	0,4671	-0,0823
14	0,1622	0,855	0,8103
15	0,0928	1,0323	0,9101
16	0,0847	1,0038	0,9156
17	0,0955	0,9642	0,901
18	0,0857	1,0185	0,9159
19	0,0847	1,0112	0,9163
20	0,0557	0,9032	0,9384
21	0,1057	1,0476	0,8991
22	0,1036	1,0454	0,9009
23	0,0886	1,0255	0,9136