

DAFTAR PUSTAKA

- [1] Dinda, “BPR Resmi Berubah Istilah Menjadi Bank Perekonomian Rakyat Lewat UU P2SK,” *Bank Perekonomian Rakyat Nusumma*, Jul. 12, 2023. [Online]. Available: https://nusumma.co.id/post/BPR_Resmi_Berubah_Istilah_Menjadi_Bank_Perekonomian_Rakyat_Lewat_UU_P2SK
- [2] A. M. Staff, “Apa Saja Tugas dan Fungsi BPR (Bank Perekonomian Rakyat),” *Bank Arto Moro*, May 02, 2025. [Online]. Available: <https://bprartomoro.co.id/apa-saja-tugas-dan-fungsi-bpr-bank-perekonomian-rakyat/>
- [3] R. F. Fazahrijan, “Jumlah BPR Terus Menurun, OJK Catat Ada 1.345 Bank Rakyat hingga Maret 2025,” *Bisnis.com*. Accessed: Sep. 12, 2025. [Online]. Available: <https://finansial.bisnis.com/read/20250617/90/1885460/jumlah-bpr-terus-menurun-ojk-catat-ada-1345-bank-rakyat-hingga-maret-2025>
- [4] B. Baihaqi, “OJK Tegaskan Penurunan Jumlah BPR Tidak Berdampak ke Kinerja Keuangan,” *NERACA*, Jakarta, Feb. 02, 2024. [Online]. Available: [https://www.neraca.co.id/article/193726/ojk-tegaskan-penurunan-jumlah-bpr-tidak-berdampak-ke-kinerja-keuangan#:~:text=NERACA. Jakarta – Otoritas Jasa Keuangan \(OJK\),tahun kinerja keuangan BPR/BPRS terus tumbuh dan](https://www.neraca.co.id/article/193726/ojk-tegaskan-penurunan-jumlah-bpr-tidak-berdampak-ke-kinerja-keuangan#:~:text=NERACA. Jakarta – Otoritas Jasa Keuangan (OJK),tahun kinerja keuangan BPR/BPRS terus tumbuh dan)
- [5] Y. Krishna, K. Kahfi, N. N. Rahma, and A. K. M. Simanjuntak, “Menjaga Keandalan Bank Kecil Melalui Saringan Modal,” *ValidNews*, Jakarta, May 07, 2024. [Online]. Available: <https://validnews.id/ekonomi/menjaga-keandalan-bank-kecil-melalui-saringan-modal>
- [6] Irawati, “Aset BPR Naik Jadi Rp203,68 Triliun Meski Jumlah Bank Susut,” *Infobanknews*. Accessed: Sep. 12, 2025. [Online]. Available: <https://infobanknews.com/aset-bpr-naik-jadi-rp20368-triliun-meski-jumlah-bank-susut/>
- [7] OJK, “RINGKASAN SURAT EDARAN OTORITAS JASA KEUANGAN NOMOR 11/POJK.03/2022 TENTANG PENILAIAN TINGKAT KESEHATAN BANK PERKREDITAN RAKYAT DAN BANK PEMBIAYAAN RAKYAT SYARIAH,” Jul. 18, 2022. [Online]. Available: <https://ojk.go.id/id/regulasi/Pages/Penilaian-Tingkat-Kesehatan-BPR-dan-BPRS.aspx>
- [8] OJK, “PEDOMAN PELAKSANAAN ANALITIK DATA DALAM RANGKA PELAKSANAAN ASURANSI DI OTORITAS JASA KEUANGAN,” SEDK.06/2023, 2023.
- [9] R. Maulid, “Kegunaan Machine Learning dalam Startup Melalui VR,” *umnadmin*, Nov. 25, 2022. Accessed: Sep. 15, 2025. [Online]. Available:

<https://www.umn.ac.id/kegunaan-machine-learning-dalam-startup-melalui-vr/>

- [10] T. S. Nurazizah, “Artificial Intelligence Dan Machine Learning Dalam Kehidupan Manusia,” no. March, 2025, [Online]. Available: <https://www.researchgate.net/publication/389143017>
- [11] N. M. Fithryani, A. R. Dikananda, D. Rohman, and K. Cirebon, “ALGORITMA K-MEANS UNTUK MENINGKATKAN SEGMENTASI POLA KEKERASAN,” vol. 13, no. 1, pp. 997–1003, 2025.
- [12] M. D. Akhda and K. D. Tania, “Comparison of K-Means and K-Medoids Algorithms for Clustering Poverty Data in South Sumatra Using DBI Evaluation,” *Digit. Zo. J. Teknol. Inf. dan Komun.*, vol. 15, no. 2, pp. 233–245, 2024, doi: 10.31849/digitalzone.v15i2.23624.
- [13] A. Yahya and R. Kurniawan, “Implementasi Algoritma K-Means untuk Pengelompokan Data Penjualan Berdasarkan Pola Penjualan,” *MALCOM Indones. J. Mach. Learn. Comput. Sci.*, vol. 5, no. 1, pp. 350–358, 2025, doi: 10.57152/malcom.v5i1.1773.
- [14] F. Widiyanto, E. T. Kirana, Nurahman, and D. Rusda, “APPLICATION OF K-MEANS AND K-MEDOIDS ALGORITHMS FOR CLUSTERING CHILI COMMODITY TRADE DISTRIBUTION IN INDONESIA,” *J. Chem. Inf. Model.*, vol. 9, no. 2, pp. 25–32, 2024.
- [15] S. E. Saqila, I. P. Ferina, and A. Iskandar, “Analisis Perbandingan Kinerja Clustering Data Mining Untuk Normalisasi Dataset,” *J. Sist. Komput. dan Inform.*, vol. 5, no. 2, p. 356, 2023, doi: 10.30865/json.v5i2.6919.
- [16] S. Fitriani, E. Budiman, M. Fadli, M. Surono, and H. Sulistiani, “Optimalisasi Metode Random Forest menggunakan Particle Swarm Optimization dalam Prediksi Prestasi Mahasiswa,” vol. 3, no. 1, pp. 406–415, 2025, [Online]. Available: <https://prosiding.seminars.id/sainteks>
- [17] M. Syahrul Efendi *et al.*, “RESOLUSI: Rekayasa Teknik Informatika dan Informasi Penerapan Algoritma Random Forest Untuk Prediksi Penjualan Dan Sistem Persediaan Produk,” *Media Online*, vol. 5, no. 1, p. 20, 2024, doi: 10.30865/resolusi.v5i1.2149.
- [18] F. Lestari, “Prediksi Finansial Distress pada Salah Satu Bank Konvensional Menggunakan Machine Learning,” *Indones. J. Appl. Math.*, vol. 3, no. 1, p. 21, 2023, doi: 10.35472/indojam.v3i1.1284.
- [19] W. Hu, C. Shao, and W. Zhang, “Predicting U.S. bank failures and stress testing with machine learning algorithms,” *Financ. Res. Lett.*, vol. 75, no. November 2024, p. 106802, 2025, doi: 10.1016/j.frl.2025.106802.
- [20] O. Y. Inonu, K. Magda, and A. Amarudin, “Analisis Kinerja Algoritma Random Forest Dengan Model Machine Learning Pada Dataset Penyakit

- Diabetes,” *Expert J. Manaj. Sist. Inf. dan Teknol.*, vol. 15, no. 1, p. 1, 2025, doi: 10.36448/expert.v15i1.4312.
- [21] D. A. Putri and Gusmanely.Z, “Comparison of K-Means and K-Medoids Algorithms in Clustering Islamic Commercial Banks in Indonesia Using Davies-Bouldin Index, Calinski-Harabasz Index, and Silhouette Coefficient,” *Inov. Pembang. J. Kelitbangan*, vol. 13, no. 1, pp. 1–12, 2025, doi: <https://doi.org/10.35450/jip.v13i01.623>.
- [22] P. K. Viswanathan, S. Srinivasan, and N. Hariharan, “Predicting Financial Health of Banks for Investor Guidance Using Machine Learning Algorithms,” *J. Emerg. Mark. Financ.*, vol. 19, no. 2, pp. 226–261, 2020, doi: 10.1177/0972652720913478.
- [23] D. B. Saputra, V. Atina, and F. E. Nastiti, “Penerapan Model Crisp-Dm Pada Prediksi Nasabah Kredit Menggunakan Algoritma Random Forest,” *IDEALIS Indones. J. Inf. Syst.*, vol. 7, no. 2, pp. 240–247, 2024, doi: 10.36080/ideal.v7i2.3244.
- [24] S. F. RZ and L. R. Goranta, “Applying Machine Learning to Economic Analysis: Predicting Bank Failures in India Using Decision Tree Models,” pp. 1–6, 2025, doi: 10.1109/stcr62650.2025.11019244.
- [25] K. Farag, L. Ali, N. C. Mutai, R. Luqman, A. Mahmoud, and N. Krasniqi, “Machine Learning for Predicting Bank Stability: The Role of Income Diversification in European Banking,” *FinTech*, vol. 4, no. 2, pp. 1–19, 2025, doi: 10.3390/fintech4020021.
- [26] E. Awoin, P. Appiahene, F. Gyasi, and A. S. University, “Predicting the Performance of Rural Banks in Ghana Using Machine Learning Approach,” *Adv. Fuzzy Syst.*, p. 7, 2020, doi: <https://doi.org/10.1155/2020/8028019>.
- [27] M. Y. Urrochman, H. Asy’ari, and A. Ro’uf, “Using Machine Learning Techniques to Predict Financial Distress in Rural Banks in Indonesia,” vol. 2, 2024.
- [28] R. Awalia and F. T. Kristanti, “PREDIKSI FINANCIAL DISTRESS MENGGUNAKAN ARTIFICIAL NEURAL NETWORK (ANN) PADA PERUSAHAAN PERBANKAN YANG TERDAFTAR DI BURSA EFEK INDONESIA (BEI) PERIODE 2017-2021,” *J. Kaji. Pendidik. Ekon. dan Ilmu Ekon.*, vol. VII, 2023.
- [29] P. Appiahene, Y. M. Missah, and U. Najim, “Predicting Bank Operational Efficiency Using Machine Learning Algorithm: Comparative Study of Decision Tree, Random Forest, and Neural Networks,” *Adv. Fuzzy Syst.*, vol. 2020, p. 12, 2020, doi: 10.1155/2020/8581202.
- [30] U. Chatterjee, J. J. French, C. Gurdgiev, and P. Borochin, “Financial intermediation and informational efficiency: Predicting business cycles,” *ELSEVIER*, vol. 96, 2024, doi: <https://doi.org/10.1016/j.iref.2024.103607>.

- [31] A. E. Pratiwi, A. D. Nurfadillah, L. Nursadrina, L. Mufida, Nurjannah, and S. R. Nengsi, "Inklusi Keuangan dalam Industri Perbankan: Mendorong Akses Layanan Perbankan," *J. Ilmu Manajemen, Bisnis dan Ekon.*, vol. 1, no. 1, pp. 19–24, 2023, doi: 10.59971/jimbe.v1i1.4.
- [32] N. K. A. Purwaningsih, A. W. S. Gama, and N. P. Y. Astiti, "Analisis Tingkat Kesehatan Bank Dengan Pendekatan Risk Profile, Good Corporategovernance, Earning Dan Capital Pada Pt Bpr ...," *Values*, pp. 24–32, 2019, [Online]. Available: <http://e-journal.unmas.ac.id/index.php/value/article/view/575>
- [33] *UNDANG-UNDANG REPUBLIK INDONESIA NOMOR 21 TAHUN 2011*. 2011.
- [34] F. Dwitama, "Comparison Analysis Of Camels And Rgec In Assessing The Level Of Health Of Bank (Case Study In Pt Bank Rakyat Indonesia (Persero), Tbk Period 2017-2019)," *Int. J. Sci. Technol. Manag.*, vol. 2, no. 5, pp. 1825–1829, 2021, doi: 10.46729/ijstm.v2i5.355.
- [35] Fitria Asmawati and Lis Setyowati, "Analisis Metode RGEC untuk Penilaian Kinerja pada PT Bank Mandiri (Persero) Tbk," *Maeswara J. Ris. Ilmu Manaj. dan Kewirausahaan*, vol. 1, no. 4, pp. 134–154, 2023, doi: 10.61132/maeswara.v1i4.79.
- [36] N. Grilseda and S. Riyadi, "Pengaruh CAR, LDR, KAP dan NPL terhadap ROA Bank Go Public yang terdaftar di BEI," *J. Ilmu Manaj.*, vol. 11, no. 1, p. 53, 2021, doi: 10.32502/jimn.v11i1.3252.
- [37] Aviva Refalina, Hilda Hilda, and Riduwansah Riduwansah, "Pengaruh NOM, BOPO dan FDR terhadap Profitabilitas pada Bank Umum Syariah (BUS) Periode 2021-2023," *Profit J. Manajemen, Bisnis dan Akunt.*, vol. 4, no. 2, pp. 187–197, 2025, doi: 10.58192/profit.v4i2.3320.
- [38] M. E. Johan, S. A. Sanjaya, A. Y. Brata, and A. Brillyant, "Gamification to Study Machine Learning using Octalysis Framework," *Ultim. J. Tek. Inform.*, vol. 15, no. 1, pp. 35–43, 2023, doi: 10.31937/ti.v15i1.3118.
- [39] J. H. Team, "Machine Learning: Contoh, Metode, Cara Kerja, Jenis & Fungsinya," Jagoan Hosting Team. Accessed: Sep. 18, 2025. [Online]. Available: <https://www.jagoanhosting.com/blog/machine-learning/>
- [40] R. P. Sari, "Apa Itu Reinforcement Learning? Cara Kerja & Contohnya," *Indonesia Artificial Intelligence Hub*, Jan. 25, 2025. [Online]. Available: <https://aihub.id/pengetahuan-dasar/reinforcement-learning>
- [41] "Mengenal CRISP-DM Framework untuk Proyek Data Science," cloudhost. Accessed: Sep. 18, 2025. [Online]. Available: <https://idcloudhost.com/blog/mengenal-crisp-dm-framework/#:~:text=CRISP-DM merupakan model standar yang dikembangkan sebagai,dan dikembangkan melalui serangkaian workshops>

yang berlangsung

- [42] E. Priambodo, T. Prahasto, and A. Widodo, “Deteksi Dini Kerusakan Bearing Menggunakan Machine Learning Pendekatan Support Vector Regression (Svr),” *J. Tek. Mesin S-1*, vol. 11, no. 3, pp. 101–112, 2023.
- [43] F. Handayani, “Aplikasi Aplikasi Data Mining Menggunakan Algoritma K-Means Clustering untuk Mengelompokan Mahasiswa Berdasarkan Gaya Belajar,” *J. Teknol. dan Inf.*, vol. 12, no. 1, pp. 46–63, 2022, doi: 10.34010/jati.v12i1.
- [44] A. Suryadibrata and J. C. Young, “Visualisasi Algoritma sebagai Sarana Pembelajaran K-Means Clustering,” *Ultim. J. Tek. Inform.*, vol. 12, no. 1, pp. 25–29, 2020, doi: 10.31937/ti.v12i1.1523.
- [45] A. A. Khan, M. S. Bashir, A. Batool, M. S. Raza, and M. A. Bashir, “K-Means Centroids Initialization Based on Differentiation Between Instances Attributes,” *Int. J. Intell. Syst.*, vol. 2024, no. 1, 2024, doi: 10.1155/2024/7086878.
- [46] Z. Wu, L. Jin, J. Zhao, L. Jing, and L. Chen, “Research on Segmenting E-Commerce Customer through an Improved K-Medoids Clustering Algorithm,” *Comput. Intell. Neurosci.*, vol. 2022, 2022, doi: 10.1155/2022/9930613.
- [47] M. D. Doi, A. Rusgiyono, and T. Wuryandari, “ANALISIS k-MEDOIDES DENGAN VALIDASI INDEKS PADA IPM DAERAH 3T DI INDONESIA,” *J. Gaussian*, vol. 12, no. 2, pp. 178–188, 2023, doi: 10.14710/j.gauss.12.2.178-188.
- [48] Y. Hasan, “Pengukuran Silhouette Score Dan Davies-Bouldin Index Pada Hasil Cluster K-Means Dan DbSCAN,” *J. Inform. dan Tek. Elektro Terap.*, vol. 12, no. 3S1, pp. 60–74, 2024, doi: 10.23960/jitet.v12i3s1.5001.
- [49] D. Feby, “Serba Serbi Machine Learning Model Random Forest,” *DQLab*, Jul. 18, 2023. Accessed: Sep. 19, 2025. [Online]. Available: <https://dqlab.id/serba-serbi-machine-learning-model-random-forest>
- [50] Jude Chukwura Obi, “A comparative study of several classification metrics and their performances on data,” *World J. Adv. Eng. Technol. Sci.*, vol. 8, no. 1, pp. 308–314, 2023, doi: 10.30574/wjaets.2023.8.1.0054.
- [51] S. Farhadpour, T. A. Warner, and A. E. Maxwell, “Selecting and Interpreting Multiclass Loss and Accuracy Assessment Metrics for Classifications with Class Imbalance: Guidance and Best Practices,” *Remote Sens.*, vol. 16, no. 3, pp. 1–22, 2024, doi: 10.3390/rs16030533.
- [52] D. Feby, “Apa Kelebihan Tools Data Science Jupyter Notebooks?,” *DQLab*. Accessed: Sep. 18, 2025. [Online]. Available: <https://dqlab.id/apa-kelebihan-tools-data-science-jupyter-notebooks>

- [53] D. Feby, "Python, Pemrograman Wajib dikuasai di Era Digital," *DQLab*, Nov. 14, 2024. [Online]. Available: <https://dqlab.id/python-pemrograman-wajib-dikuasai-di-era-digital#:~:text=selama proses belajar.,1.,paling sesuai dengan kebutuhan mereka>.
- [54] T. Monks and A. Harper, "Improving the usability of open health service delivery simulation models using Python and web apps," *NIHR Open Res.*, vol. 3, p. 48, 2023, doi: 10.3310/nihropenres.13467.2.
- [55] R. A. Putri, "Perbandingan Metodologi Penelitian Data Mining: SEMMA, CRISP-DM, dan KDD," *Binus (School of Information Systems)*, Jul. 22, 2025. Accessed: Sep. 19, 2025. [Online]. Available: <https://sis.binus.ac.id/2025/07/22/perbandingan-metodologi-penelitian-data-mining-semma-crisp-dm-dan-kdd/>
- [56] T. Peoples, "Data Mining and Analytics Frameworks: CRISP-DM, KDD, and SEMMA — A High-Level Overview," *medium*, Oct. 21, 2024. Accessed: Sep. 19, 2025. [Online]. Available: <https://medium.com/%40tonjaps3/data-mining-and-analytics-frameworks-crisp-dm-kdd-and-semma-a-high-level-overview-673cb594d2ac>

