



E-ISSN 3032-601X & P-ISSN 3032-7105

Vol. 3, No. 1, 2026

MISTER

**Journal of Multidisciplinary Inquiry in Science,
Technology and Educational Research**

**Jurnal Penelitian Multidisiplin dalam Ilmu
Pengetahuan, Teknologi dan Pendidikan**

**UNIVERSITAS SERAMBI MEKKAH
KOTA BANDA ACEH**

mister@serambimekkah.ac.id

Journal of Multidisciplinary Inquiry in Science Technology
and Educational Research

Journal of MISTER

Vol. 3, No. 1, 2026

Pages: 1343–1351

Mengungkap Pola Asosiasi Penjualan dengan Algoritma FP-Growth Data Mining

Muhammad Rizqi Fathurrohman, Hasbi Firmansyah, Ria Indah Fitria

Universitas Pancasakti Tegal

Article in Journal of MISTER

Available at : <https://jurnal.serambimekkah.ac.id/index.php/mister>

DOI : <https://doi.org/10.32672/mister.v3i1.4062>

How to Cite this Article

APA : Arfan, R., Firmansyah, H. ., & fitria, ria. (2025). Mengungkap Pola Asosiasi Penjualan dengan Algoritma FP-Growth Data Mining. Journal of Multidisciplinary Inquiry in Science, Technology and Educational Research, 3(1), 1343 - 1351. <https://doi.org/10.32672/mister.v3i1.4062>

Others Visit : <https://jurnal.serambimekkah.ac.id/index.php/mister>

MISTER: *Journal of Multidisciplinary Inquiry in Science, Technology and Educational Research* is a scholarly journal dedicated to the exploration and dissemination of innovative ideas, trends and research on the various topics include, but not limited to functional areas of Science, Technology, Education, Humanities, Economy, Art, Health and Medicine, Environment and Sustainability or Law and Ethics.

MISTER: *Journal of Multidisciplinary Inquiry in Science, Technology and Educational Research* is an open-access journal, and users are permitted to read, download, copy, search, or link to the full text of articles or use them for other lawful purposes. Articles on Journal of MISTER have been previewed and authenticated by the Authors before sending for publication. The Journal, Chief Editor, and the editorial board are not entitled or liable to either justify or responsible for inaccurate and misleading data if any. It is the sole responsibility of the Author concerned.



ISSN 3032-7105

ISSN 3032-601X



Mengungkap Pola Asosiasi Penjualan dengan Algoritma FP-Growth Data Mining

Muhammad Rizqi Fathurrohman¹, Hasbi Firmansyah², Ria Indah Fitria³
Prodi Informatika, Fakultas Teknik dan Ilmu Komputer, Universitas Pancasakti Tegal, Tegal,
Indonesia^{1,2,3}

*Email muhammadrizqifathurrohman067@gmail.com, hasbifirmansyah@upstegal.ac.id,
ria_indah@upstegal.ac.id

Diterima: 19-12-2025

| Disetujui: 29-12-2025

| Diterbitkan: 31-12-2025

ABSTRACT

This study analyzes sales transaction data to identify product association patterns using the FP-Growth algorithm. A data mining approach is applied, including data preprocessing stages such as data selection, transformation, and binarization to ensure compatibility with the algorithm. Frequent itemsets are generated based on minimum support values and further processed to produce association rules evaluated using confidence and lift measures. The results demonstrate that the FP-Growth algorithm is able to efficiently discover meaningful association patterns without generating candidate itemsets, making it suitable for large transactional datasets. The identified rules reflect consistent customer purchasing behavior and reveal strong relationships among certain products. These findings can support business decision-making, particularly in developing marketing strategies, optimizing product placement, and improving inventory management. Overall, this study confirms that the FP-Growth algorithm is an effective method for extracting valuable knowledge from sales transaction data.

Keywords: Data Mining; FP-Growth; Association Rules; Sales Transactions; Frequent Itemsets.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis data transaksi penjualan guna mengidentifikasi pola asosiasi antar produk menggunakan algoritma FP-Growth. Pendekatan data mining diterapkan melalui tahapan pra-pemrosesan data yang meliputi seleksi atribut, transformasi data, dan pembentukan data biner agar sesuai dengan kebutuhan algoritma. Frequent itemset dibentuk berdasarkan nilai minimum support dan selanjutnya digunakan untuk menghasilkan aturan asosiasi yang dievaluasi menggunakan nilai confidence dan lift. Hasil penelitian menunjukkan bahwa algoritma FP-Growth mampu mengekstraksi pola asosiasi penjualan secara efektif dan efisien tanpa proses pembangkitan kandidat itemset. Pola yang dihasilkan mencerminkan perilaku pembelian konsumen yang konsisten serta menunjukkan hubungan yang kuat antar produk tertentu. Temuan ini dapat dimanfaatkan sebagai informasi pendukung dalam pengambilan keputusan, khususnya dalam penyusunan strategi pemasaran, penataan produk, dan pengelolaan persediaan.

Kata kunci: Data Mining; FP-Growth; Aturan Asosiasi; Transaksi Penjualan; Frequent Itemset.

PENDAHULUAN

Perkembangan jumlah transaksi penjualan dalam industri ritel modern telah mendorong kebutuhan akan teknik analisis data yang mampu menemukan pola pembelian secara cepat dan akurat. Menurut (Marcelino Irawan et al., 2021) peningkatan volume data transaksi membuat perusahaan membutuhkan algoritma yang mampu mengekstrak pola secara efisien tanpa membebani proses komputasi. Dalam konteks tersebut, algoritma FP-Growth menjadi salah satu solusi yang banyak digunakan pada analisis *market basket*. (Purwati et al., 2023) menjelaskan bahwa FP-Growth lebih unggul dibandingkan Apriori karena tidak memerlukan proses pembangkitan kandidat (*candidate generation*) yang memakan waktu. Hal ini sejalan dengan temuan (Prayitno et al., 2023) yang menyatakan bahwa FP-Growth memiliki performa yang lebih stabil pada dataset besar. Pada studi yang berbeda, (Putri et al., 2024) menegaskan bahwa FP-Growth dapat mengidentifikasi pola pembelian konsumen dengan akurasi yang tinggi serta membantu perusahaan memahami perilaku pelanggan. Kemudian (Ningrum et al., 2025) menjelaskan bahwa metode asosiasi berbasis FP-Growth menghasilkan aturan yang relevan untuk mendukung keputusan bisnis secara real time.

Penelitian (Lintang Mugi Lestari & Irfan Ali, 2023). turut memperkuat temuan tersebut dengan menunjukkan bahwa FP-Growth efektif dalam menentukan kombinasi barang paling dominan dalam transaksi penjualan harian. Hasil serupa dikemukakan oleh (Hardiyanti & Ernawati, 2023). yang menyatakan bahwa FP-Growth membantu perusahaan menganalisis pola transaksi untuk perencanaan persediaan yang lebih optimal.

Secara umum, literatur mutakhir menunjukkan bahwa FP-Growth terus dikembangkan dan diaplikasikan secara luas untuk mendukung pengambilan keputusan berbasis data. (Syah Zikri & Ikhsan, 2025) bahkan menegaskan bahwa FP-Growth telah menjadi algoritma standar dalam analisis asosiasi modern berkat efisiensi dan skalabilitasnya. Dengan melihat relevansi dan banyaknya temuan empiris, penelitian ini bertujuan mengungkap pola asosiasi penjualan menggunakan algoritma FP-Growth serta mengevaluasi aturan yang terbentuk sebagai rekomendasi untuk strategi pemasaran dan optimasi penjualan.

Pada sektor usaha kecil dan menengah, (Di & Lashira, 2025). menyatakan bahwa penerapan FP-Growth pada data penjualan kafe mampu meningkatkan efektivitas promosi menu. (Informatika et al., 2025) juga menegaskan bahwa FP-Growth dapat diterapkan pada perusahaan berskala besar karena memiliki skalabilitas yang baik.

Dalam sektor farmasi, (Muntari, 2024). membuktikan bahwa FP-Growth dapat mengidentifikasi pola pembelian obat yang sering terjadi, sehingga membantu pengelolaan stok. Penelitian tersebut diperkuat oleh (Nugroho et al., 2025) yang menyatakan bahwa FP-Growth mampu mengoptimalkan manajemen persediaan melalui analisis transaksi dalam jumlah besar.

METODE PENELITIAN

Metode penelitian yang digunakan dalam studi ini adalah data mining dengan pendekatan association rule mining menggunakan algoritma FP-Growth untuk menganalisis pola asosiasi penjualan. Menurut (Wahyu Alfafisabil et al., 2021). penerapan FP-Growth dalam penelitian data mining harus melalui tahapan pra-pemrosesan data yang meliputi pembersihan dan transformasi data agar frequent itemset yang dihasilkan bersifat valid dan akurat. (Rustam et al., 2024). menyatakan bahwa penentuan nilai minimum *support* dan *confidence* merupakan aspek metodologis penting dalam penelitian FP-Growth

karena berpengaruh langsung terhadap kualitas aturan asosiasi yang dihasilkan. (Data et al., 2025). menjelaskan bahwa tahapan *data understanding* dan *data transformation* berperan penting dalam metode penelitian FP-Growth untuk memastikan struktur data sesuai dengan kebutuhan algoritma.

Support (Akurat & Standar)

Support menyatakan proporsi transaksi yang mengandung item atau itemset tertentu.

$$SUPPORT(X) = \frac{|\{t \in T | X \subseteq t\}|}{|T|}$$

Keterangan:

- X = item atau itemset
- T = seluruh transaksi
- t = satu transaksi

1. Pengumpulan Data

Mengumpulkan data transaksi penjualan yang digunakan sebagai objek penelitian.

2. Pra-Pemrosesan Data

Melakukan pembersihan, seleksi, dan transformasi data agar sesuai dengan format yang dibutuhkan algoritma FP-Growth.

3. Penentuan Parameter

Menetapkan nilai minimum *support* dan *confidence* sebagai parameter dalam pembentukan aturan asosiasi.

4. Penerapan Algoritma FP-Growth

Menerapkan algoritma FP-Growth untuk menemukan frequent itemset dan menghasilkan aturan asosiasi dari data transaksi.

5. Evaluasi dan Analisis Hasil

Mengevaluasi aturan asosiasi menggunakan nilai *support*, *confidence*, dan *lift*, kemudian menganalisis hasil untuk menarik kesimpulan dan rekomendasi.

HASIL DAN PEMBAHASAN

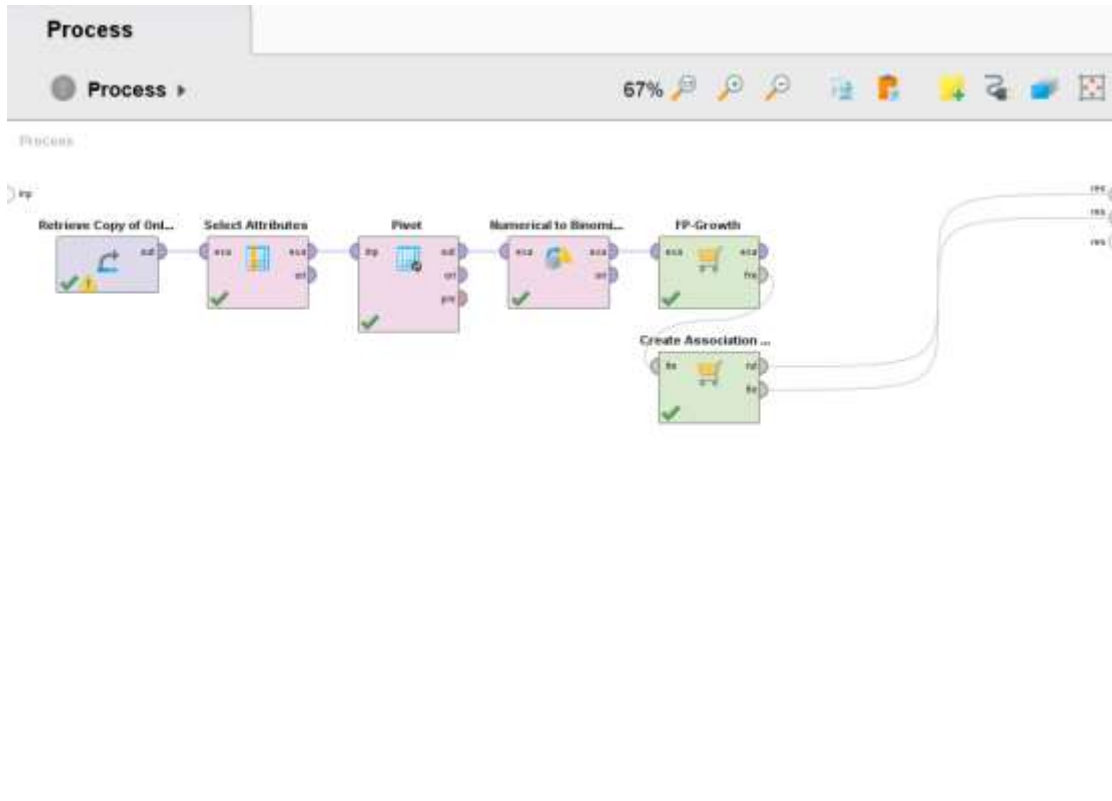
Hasil penelitian menunjukkan bahwa penerapan algoritma FP-Growth pada data transaksi penjualan mampu menghasilkan aturan asosiasi yang relevan berdasarkan nilai *support*, *confidence*, dan *lift*. Aturan asosiasi dengan nilai *confidence* dan *lift* yang tinggi menunjukkan adanya hubungan positif dan keterkaitan yang kuat antar item yang sering dibeli secara bersamaan oleh konsumen, sehingga mencerminkan pola pembelian yang konsisten. Nilai *support* yang tinggi pada beberapa aturan mengindikasikan item-item yang dominan dan memiliki tingkat kemunculan tinggi dalam transaksi penjualan. Temuan ini membuktikan bahwa algoritma FP-Growth mampu mengekstraksi pola pembelian konsumen secara efektif dan efisien tanpa melalui proses pembangkitan kandidat itemset, sehingga waktu komputasi menjadi lebih optimal. Pola asosiasi yang dihasilkan memberikan gambaran perilaku konsumen dalam memilih produk dan dapat dimanfaatkan sebagai informasi pendukung dalam pengambilan

keputusan, khususnya dalam penyusunan strategi pemasaran, perencanaan promosi, penataan tata letak produk, serta pengelolaan persediaan agar lebih sesuai dengan kebutuhan pasar dan meningkatkan kinerja penjualan.

Tabel 1. Judul Tabel

InvoiceNo	StockCode	Description	Quantity	InvoiceDate	UnitPrice	CustomerID	Country
536365	85123A	WHITE HANGING HEART T- LIGHT HOLDER	6	01/12/2010 08:26	2,55	17850	United Kingdom
536365	71053	WHITE METAL LANTERN	6	01/12/2010 08:26	3,39	17850	United Kingdom
536365	84406B	CREAM CUPID HEARTS COAT HANGER	8	01/12/2010 08:26	2,75	17850	United Kingdom
536365	84029G	KNITTED UNION FLAG HOT WATER BOTTLE	6	01/12/2010 08:26	3,39	17850	United Kingdom
536365	84029E	RED WOOLLY HOTTIE WHITE HEART.	6	01/12/2010 08:26	3,39	17850	United Kingdom
536365	22752	SET 7 BABUSHKA NESTING BOXES	2	01/12/2010 08:26	7,65	17850	United Kingdom
536365	21730	GLASS STAR FROSTED T- LIGHT HOLDER	6	01/12/2010 08:26	4,25	17850	United Kingdom
536366	22633	HAND WARMER UNION JACK	6	01/12/2010 08:28	1,85	17850	United Kingdom
536366	22632	HAND WARMER RED POLKA	6	01/12/2010 08:28	1,85	17850	United Kingdom

DOT



Gambar 1. Process

Gambar tersebut menunjukkan alur pengolahan data transaksi penjualan menggunakan RapidMiner dengan algoritma FP-Growth. Proses diawali dengan pengambilan data menggunakan operator *Retrieve*, dilanjutkan dengan pemilihan atribut relevan melalui *Select Attributes*. Struktur data kemudian diubah menggunakan *Pivot* agar sesuai dengan format transaksi. Selanjutnya, operator *Numerical to Binomial* digunakan untuk mengonversi data numerik menjadi data biner. Algoritma *FP-Growth* diterapkan untuk menghasilkan *frequent itemset* berdasarkan nilai minimum *support*. Hasil tersebut kemudian diproses menggunakan *Create Association Rules* untuk membentuk aturan asosiasi yang dievaluasi berdasarkan nilai *confidence* dan *lift* sebagai dasar analisis pola penjualan.

Result History

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

FP-Growth frequent sets -- Create Association Rules, item sets

</

Gambar 2. FrequentItemSets (FP-Growth)

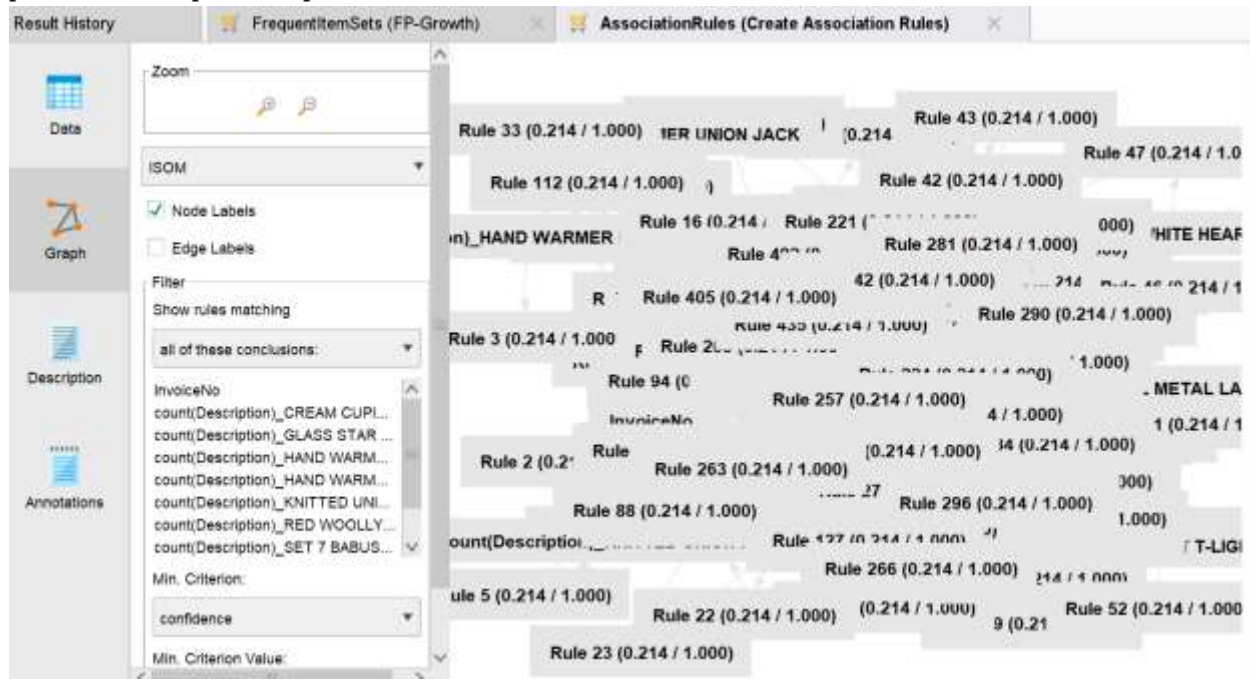
Gambar tersebut menampilkan hasil *frequent itemsets* yang dihasilkan oleh algoritma FP-Growth pada RapidMiner. Dari hasil pengolahan data, diperoleh sebanyak 261 *frequent itemset* dengan ukuran itemset minimum 1 dan maksimum 8. Nilai *support* yang ditampilkan menunjukkan tingkat kemunculan setiap item atau kombinasi item dalam seluruh transaksi. Itemset dengan ukuran kecil memiliki nilai *support* yang relatif tinggi, yang mengindikasikan item-item dominan dalam transaksi penjualan. Hasil *frequent itemset* ini menjadi dasar dalam pembentukan aturan asosiasi pada tahap selanjutnya menggunakan operator *Create Association Rules* untuk analisis hubungan antar item.

No.	Premises	Conclusion
6	count(Description)_RED WOOLLY HOTTIE WHIT...	InvoiceNo
7	count(Description)_SET 7 BABUSHKA NESTING ...	InvoiceNo
8	count(Description)_WHITE HANGING HEART T-LI...	InvoiceNo
9	count(Description)_WHITE METAL LANTERN	InvoiceNo
10	count(Description)_CREAM CUPID HEARTS COA...	count(Description)_GLASS STAR FROSTED T-LI...
11	count(Description)_GLASS STAR FROSTED T-LI...	count(Description)_CREAM CUPID HEARTS COA...
12	count(Description)_CREAM CUPID HEARTS COA...	count(Description)_KNITTED UNION FLAG HOT ...
13	count(Description)_KNITTED UNION FLAG HOT ...	count(Description)_CREAM CUPID HEARTS COA...
14	count(Description)_CREAM CUPID HEARTS COA...	count(Description)_RED WOOLLY HOTTIE WHIT...
15	count(Description)_RED WOOLLY HOTTIE WHIT...	count(Description)_CREAM CUPID HEARTS COA...
16	count(Description)_CREAM CUPID HEARTS COA...	count(Description)_SET 7 BABUSHKA NESTING ...
17	count(Description)_SET 7 BABUSHKA NESTING ...	count(Description)_CREAM CUPID HEARTS COA...
18	count(Description)_CREAM CUPID HEARTS COA...	count(Description)_WHITE HANGING HEART T-LI...
19	count(Description)_WHITE HANGING HEART T-LI...	count(Description)_CREAM CUPID HEARTS COA...

Gambar 3. AssociationRules (Create Association Rules)

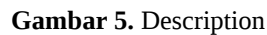
Gambar tersebut menampilkan hasil aturan asosiasi yang dihasilkan dari proses *Create Association Rules* berdasarkan *frequent itemset* FP-Growth. Setiap aturan terdiri dari bagian *premises* dan *conclusion*

yang menunjukkan hubungan antar item dalam transaksi penjualan. Aturan asosiasi yang terbentuk menunjukkan bahwa beberapa produk memiliki kecenderungan kuat untuk dibeli secara bersamaan, yang ditunjukkan oleh pemenuhan nilai minimum *confidence* yang telah ditetapkan. Hasil ini menggambarkan pola pembelian konsumen yang konsisten terhadap kombinasi produk tertentu dan dapat dimanfaatkan sebagai dasar analisis perilaku konsumen serta pendukung pengambilan keputusan dalam strategi pemasaran dan penataan produk.



Gambar 4. Graph

Gambar tersebut menampilkan visualisasi graf aturan asosiasi yang dihasilkan dari proses *Create Association Rules* pada RapidMiner. Setiap simpul merepresentasikan aturan asosiasi, sedangkan garis penghubung menunjukkan hubungan antara *premises* dan *conclusion*. Nilai yang ditampilkan pada setiap aturan menunjukkan nilai *support* dan *confidence*, di mana sebagian besar aturan memenuhi nilai *confidence* maksimum yang telah ditetapkan. Visualisasi ini memudahkan identifikasi pola asosiasi yang dominan serta keterkaitan antar item dalam transaksi penjualan. Hasil ini memperkuat temuan bahwa algoritma FP-Growth mampu mengungkap pola pembelian konsumen secara jelas dan dapat digunakan sebagai dasar analisis hubungan antar produk.



KESIMPULAN

DAFTAR PUSTAKA

- Data, R. T., Soewignyo, F., Soewignyo, T. I., Mokodaser, W. G., Orion, A., Klabat, U., Utara, S., Komputer, F. I., Klabat, U., Utara, S., & Itemset, F. (2025). *Evaluasi Kinerja Algoritma Apriori dan FP-Growth untuk Association Rule Mining pada Data Transaksi Ritel*. 24(4), 1237–1249. <https://doi.org/10.62411/tc.v24i4.14952>
- Di, M., & Lashira, C. (2025). *PEMANFAATAN ALGORITMA FP-GROWTH UNTUK*. 9(1), 48–54. <https://doi.org/doi.org/10.59697/jik.v9i1.936>
- Hardiyanti, R., & Ernawati, T. (2023). *Penerapan Algoritma Frequent Pattern Growth Pada Pola Pembelian Konsumen (Studi Kasus G . I . B Store Kota Cimahi)*. V(3), 9–15. <https://doi.org/10.23960/jitet.v13i3S1.6773>
- Informatika, T., Komputer, T., Batam, U. P., Soeprapto, J. R., Kuning, M., & Riau, K. (2025). *Penerapan Data Mining Menggunakan Algoritma FP-Growth Pada Data Penjualan PT CML BATAMINDO Implementation Data Mining Using FP-Growth Algorithm on Sales Data PT CML BATAMINDO*.

- 7(02), 142–148. <https://doi.org/10.52303/jb.v7i2.165>
- Lintang Mugi Lestari, & Irfan Ali. (2023). Penerapan Algoritma FP-Growth Untuk Menentukan Pola Penjualan Toko Ellia Umami. *Journal of Student Research*, 1(3), 367–378. <https://doi.org/10.55606/jsr.v1i3.1267>
- Marcelino Irawan, K., Tri Wulansari, T., & Wanti Wulan Sari, N. (2021). Market Basket Analysis Method on Sales Data Using Fp-Growth Algorithm. *Multica Science and Technology (Mst) Journal*, 1(2), 55–60. <https://doi.org/10.47002/mst.v1i2.239>
- Muntari, S. (2024). Data Mining Menggunakan Algoritma Fp-Growth Untuk Menganalisa. *JITET (Jurnal Informatika Dan Teknik Elektro Terapan)*, 12(3). <https://doi.org/10.23960/jitet.v12i3.4860>
- Ningrum, R., Aulia, N., Prabukusumo, M. A., & Hidayati, A. (2025). *Implementation of association method using fp-growth algorithm on sales transaction data at Koperasi Primer Pullahta Hankam Pusdatin KEMHAN RI*. 14(1), 231–244. www.ejournal.isha.or.id/index.php/Mandiri
- Nugroho, R. A., Suarna, N., Ali, I., & Efendi, D. I. (2025). Penerapan Algoritma Fp-Growth Untuk Optimalisasi Pola Asosiasi Dalam Data Transaksi Penjualan Obat: Studi Kasus Di Apotek Xyz. *Jurnal Informatika Dan Teknik Elektro Terapan*, 13(1), 419–428. <https://doi.org/10.23960/jitet.v13i1.5621>
- Prayitno, J., Saputra, B., Rahayu, S. A., & Hariguna, T. (2023). Market Basket Analysis Using FP-Growth Algorithm to Design Marketing Strategy by Determining Consumer Purchasing Patterns. *Journal of Applied Data Sciences*, 4(1), 38–49.
- Purwati, N., Pedliyansah, Y., Kurniawan, H., Karnila, S., & Herwanto, R. (2023). Komparasi Metode Apriori dan FP-Growth Data Mining Untuk Mengetahui Pola Penjualan. *Jurnal Informatika: Jurnal Pengembangan IT*, 8(2), 155–161. <https://doi.org/10.30591/jpit.v8i2.4876>
- Putri, I. D., Yuhandri, & Hardianto, R. (2024). Application of the FP-Growth Algorithm in Consumer Purchasing Pattern Analysis. *Journal of Computer Scine and Information Technology*, 10, 44–49. <https://doi.org/10.35134/jcsitech.v10i2.99>
- Rustam, C., Defit, S., & Nurcahyo, G. W. (2024). Penerapan Data Mining Menggunakan Algoritma FP-Growth Dalam Analisis Data Penjualan. *Jurnal KomtekInfo*, 11(4), 205–212. <https://doi.org/10.35134/komtekinfo.v11i4.547>
- Syah Zikri, F., & Ikhsan, M. (2025). The Comparison Between The Apriori Algorithm And The FP-Growth Algorithm In Determining Frequent Pattern. *INOVTEK Polbeng - Seri Informatika*, 10(2), 615–625. <https://doi.org/10.35314/s1yanj03>
- Wahyu Alfafisabil, Dermawan, B. A., & Padilah, T. N. (2021). Penerapan Algoritme Fp-Growth Untuk Menentukan Peletakan Barang Pedagang Sayur. *Jurnal Informatika Polinema*, 7(4), 43–48. <https://doi.org/10.33795/jip.v7i4.507>