

Eksplorasi Pasar Mobil Bekas di Platform Carmudi.co.id dengan Web Scrapping dan Data Analytics





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Education

Informatika, Universitas Sebelas Maret

Working

Data Analyst at FinAccel

Project Background

PROJECT BACKGROUND

- **Deskripsi:** Proyek ini membangun data pipeline untuk menganalisis penjualan mobil bekas dari Carmudi.co.id, dengan tujuan memberikan insight yang akurat tentang tren pasar. Data dikumpulkan melalui web scraping, diproses menggunakan Apache Airflow sebagai orkestrator pipeline. Kemudian, data divisualisasikan di Metabase dalam bentuk dashboard interaktif dan insightful.

PROJECT BACKGROUND

- **Tujuan:**
 - Menyediakan insight tentang tren harga dan penjualan mobil bekas.
 - Mempermudah analisis berdasarkan merek, lokasi, tahun produksi, dan fitur lainnya.
 - Mengotomatiskan pengambilan dan pembaruan data dengan Apache Airflow.
 - Membuat dashboard yang mudah dipahami untuk memantau dinamika pasar.
- **Hasil yang Diharapkan:** Insightful Dashboard Pasar Mobil Bekas

Problem Statement

Sulit untuk mengetahui harga pasaran mobil terkini karena iklan yang sangat banyak di marketplace.
Selain itu juga banyak duplikasi data pada iklan mobil karena penjual memiliki banyak iklan dengan produk yang sama.

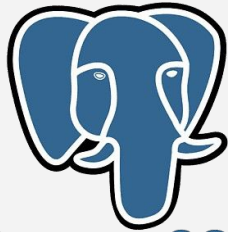
Tools

Data Source

Web Scraping:



Data Lake



PostgreSQL

Data Mart



Visualization



Code Overview: Airflow



```
🔥 docker-compose-airflow.yml
services:
  scheduler:
    image: ajinusa-de8-dibimbing/airflow
    container_name: ${AIRFLOW_SCHEDULER_CONTAINER_NAME}
    hostname: ${AIRFLOW_SCHEDULER_CONTAINER_NAME}
    command: scheduler
    restart: always
    environment:
      - AIRFLOW__CORE__SQL_ALCHEMY_CONN=postgresql+psycopg2:
      - AIRFLOW__CORE__EXECUTOR=LocalExecutor
      - POSTGRES_USER=${POSTGRES_USER}
      - POSTGRES_PASSWORD=${POSTGRES_PASSWORD}
      - POSTGRES_DB=${POSTGRES_DB}
      - POSTGRES_DW_DB=${POSTGRES_DW_DB}
      - POSTGRES_CONTAINER_NAME=${POSTGRES_CONTAINER_NAME}
      - POSTGRES_PORT=${POSTGRES_PORT}
      - SPARK_MASTER_HOST_NAME=${SPARK_MASTER_HOST_NAME}
      - SPARK_MASTER_PORT=${SPARK_MASTER_PORT}
      - AIRFLOW__CORE__SQL_ALCHEMY_CONN=mysql+mysqldb://root:
      # - AIRFLOW__CORE__SQL_ALCHEMY_CONN=mysql+mysqldb://root:
    volumes:
      - ../dags:/opt/airflow/dags
```

```
docker > 🔥 docker-compose-airflow.yml
1 services:
27
28 webserver:
29   image: ajinusa-de8-dibimbing/airflow
30   container_name: ${AIRFLOW_WEBSERVER_CONTAINER_NAME}
31   hostname: ${AIRFLOW_WEBSERVER_CONTAINER_NAME}
32   entrypoint: /scripts/entrypoint.sh
33   restart: always
34   depends_on:
35     - scheduler
36   environment:
37     - AIRFLOW__CORE__SQL_ALCHEMY_CONN=postgres
38     - AIRFLOW__CORE__EXECUTOR=LocalExecutor
39     - POSTGRES_USER=${POSTGRES_USER}
40     - POSTGRES_PASSWORD=${POSTGRES_PASSWORD}
41     - POSTGRES_DB=${POSTGRES_DB}
42     - POSTGRES_DW_DB=${POSTGRES_DW_DB}
43     - POSTGRES_CONTAINER_NAME=${POSTGRES_CONTA
44     - POSTGRES_PORT=${POSTGRES_PORT}
45     - SPARK_MASTER_HOST_NAME=${SPARK_MASTER_HO
46     - SPARK_MASTER_PORT=${SPARK_MASTER_PORT}
47     # - AIRFLOW__CORE__SQL_ALCHEMY_CONN=mysql+
48     - AIRFLOW__CORE__SQL_ALCHEMY_CONN=mysql+my
```

Code Overview: Mysql

```
docker > 🐘 docker-compose-mysql.yml
```

```
1  version: '3.8'
2
3  services:
4    mysql:
5      image: mysql:latest
6      container_name: ajinusa-mysql-container
7      environment:
8        MYSQL_ROOT_PASSWORD: ajinusa
9        MYSQL_DATABASE: de8_final_project
10     ports:
11       - "3306:3306"
12     networks:
13       - ajinusa-de8-network
14     restart: always
15     volumes:
16       - mysql-data:/var/lib/mysql # Untuk menyimpan data MySQL di volume
17       - ../my.cnf:/etc/mysql/my.cnf # Menambahkan file konfigurasi custom
18
19   volumes:
20     mysql-data:
21
22   # networks:
```

Code Overview: Postgres

```
docker > 🐙 docker-compose-postgres.yml
1  version: "3.8"
2
3  services:
4    ajinusa-de8-postgres:
5      image: postgres:11
6      container_name: ${POSTGRES_CONTAINER_NAME}
7      restart: unless-stopped
8      hostname: ${POSTGRES_CONTAINER_NAME}
9      networks:
10     - ajinusa-de8-network
11     environment:
12       - POSTGRES_PASSWORD=${POSTGRES_PASSWORD}
13       - POSTGRES_USER=${POSTGRES_USER}
14       - POSTGRES_DB=${POSTGRES_DB}
15       - PGDATA=/var/lib/postgresql/data/pgdata
16   volumes:
17     - ../sql:/sql
18     - ../data:/data
19   ports:
20     - ${POSTGRES_PORT}:5432
```

Code Overview: Metabase

```
docker > 🐳 docker-compose-metabase.yml
```

```
1  version: '3.8'
2
3  services:
4    metabase:
5      image: metabase/metabase:latest
6      container_name: metabase
7      ports:
8        - "3000:3000" # Port untuk akses Metabase
9      environment:
10        - MB_DB_TYPE=mysql
11        - MB_DB_DBNAME=de8_final_project # Nama database yang digunakan di MySQL
12        - MB_DB_HOST=ajinusa-mysql-container # Nama container MySQL
13        - MB_DB_USER=root # Username untuk MySQL
14        - MB_DB_PASS=ajinusa # Password untuk MySQL
15        - MB_DB_PORT=3306 # Port MySQL
16      restart: always
17      networks:
18        - ajinusa-de8-network
19
```

Containers

Images

Volumes

Builds

Docker Hub

Docker Scout

Extensions

Containers [Give feedback](#)

View all your running containers and applications. [Learn more](#)

Container CPU usage

4.50% / 1200% (12 CPUs available)

Container memory usage

2.86GB / 7.42GB

[Show charts](#)



Only show running containers


<input type="checkbox"/>		Name	Container ID	Image	Port	Actions
<input type="checkbox"/>	▼	<u>docker</u>	-	-	-	
<input type="checkbox"/>		ajinusa-de8-postgres	3cc269e53cd5	postgres:11	5432	
<input type="checkbox"/>		ajinusa-mysql-container	5bea78768e4e	mysql:latest	3306	
<input type="checkbox"/>		ajinusa-de8-airflow-scheduler	ede4edd10198	ajinusa-de8-dibimbing/airflow		
<input type="checkbox"/>		ajinusa-de8-airflow-webserver	f1009936e2d1	ajinusa-de8-dibimbing/airflow	8080	
<input type="checkbox"/>		metabase	5e6ab7afb4e9	metabase/metabase:latest	3000	

Data Understanding

- **Sumber Data:** Carmudi.co.id
- **Jenis data:** Data Mobil Bekas
- **Jumlah data:** 18,000
- **Jumlah Kolom :** 12

Data yang diambil di antaranya:

1. Judul
2. Tahun
3. Merek
4. Nama Mobil
5. Harga
6. Kilometer
7. Transmisi
8. Lokasi
9. Tipe Penjual
10. WA Number
11. Link Iklan
12. *snapshot_dt*


Mobil Baru ▾ Mobil Bekas ▾ Motor ▾ Carsentro ▾ Berita Otomotif ▾ Iklankan dengan kami ▾ Produk Finansial ▾ Ma

Filter Pencarian

Atur ulang ↺

Mobil dengan >

Kondisi Mobil... ✕

Merek >

Provinsi >


Harga >

Tahun >

Kilometer >

Transmisi >

Tipe Bodi >



Tahun 2019 Warna Hitam 1.3 Turbo Bensin, kondisi ...


Rp 730.000.000

BANDINGKAN

SIMPAN

Kontak

WhatsApp



1994 Mitsubishi Lancer 1.6 VI GLi Sedan

Dijual Cepat Lancer Evo 3

Rp 37.000.000

BANDINGKAN

SIMPAN

Kontak

WhatsApp

95 - 100K KM

Manual

DKI Jakarta

Private

« Pertama

« Sebelumnya

736

737

738

739

740

Selanjutnya »

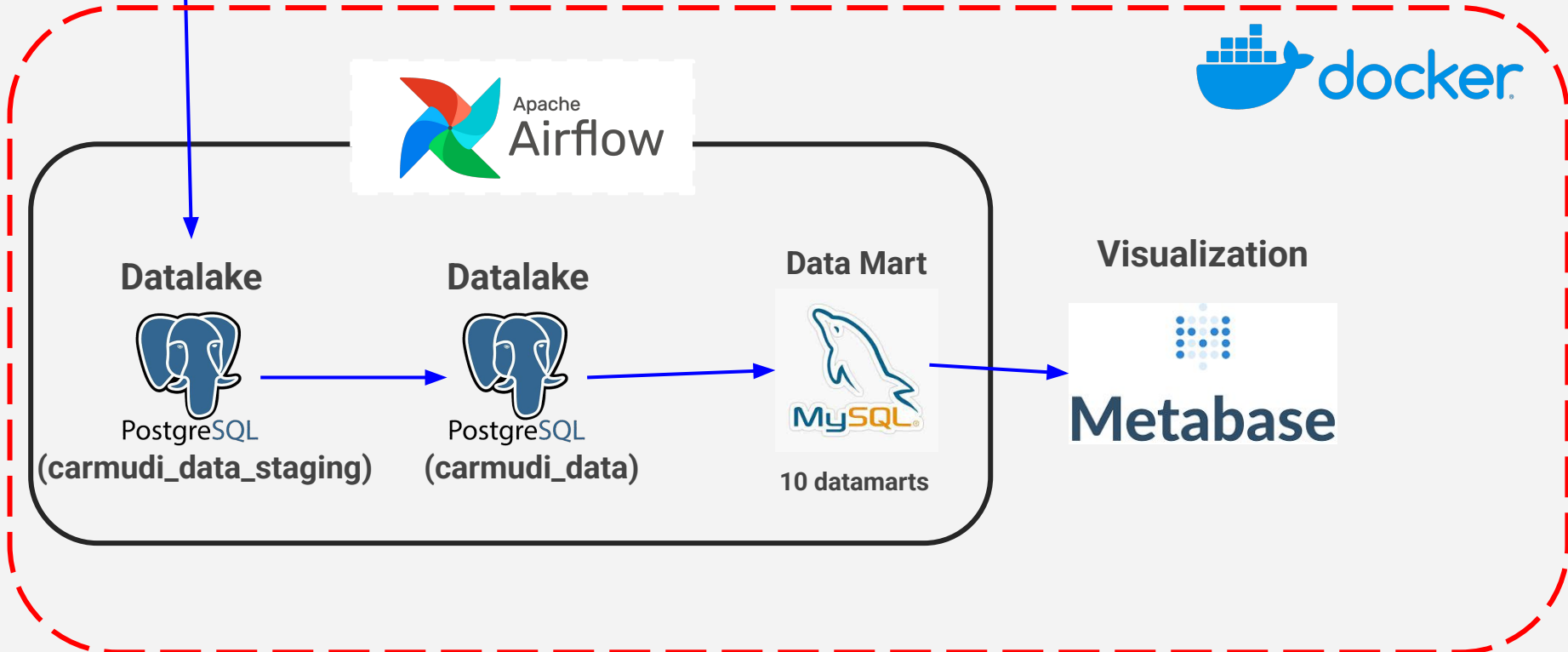
Terakhir »

Pencarian Terpopuler

Web Scraping:

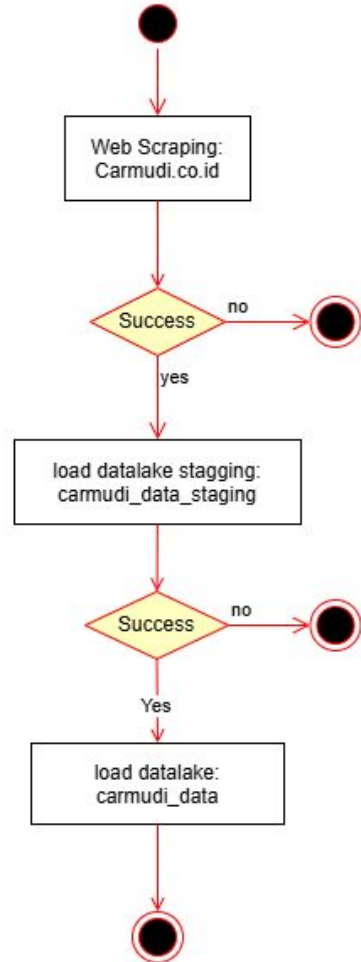


Architecture Pipeline

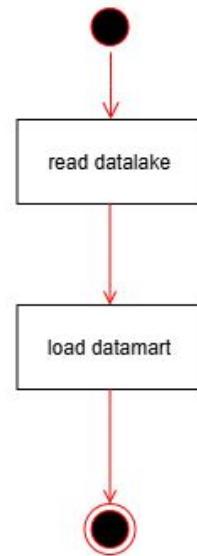


DAGs

web_scraping_carmudi.py



create_datamart.py



DAGs : Web Scraping

dags > web_scraping_carmudi.py > web_scraping > extract_web > convert_to_number

```
29 def web_scraping():
45     def extract_web(param1, param3):
46
47         # for url in urls:
48         for i in range(1, param3 + 1):
49             url = f"{param1}{i}"
50
51             # Request ke website
52             response = requests.get(url, headers=headers)
53
54             # Parsing HTML dengan BeautifulSoup
55             soup = BeautifulSoup(response.text, "html.parser")
56
57             # Scrape data mobil
58             items = soup.find_all("article", class_="listing") # Sesuaikan dengan class dari Carmudi
59             # print(items)
60             def convert_to_number(rp_string):
61                 return int(rp_string.replace("Rp", "").replace(".", "").strip())
62
63             for item in items:
64                 try:
65                     judul = item.find("h2", class_="listing__title").text.strip()
66                     tahun = judul.split(" ")[0]
```

DAGs : Web Scraping

dags > web_scraping_carmudi.py > web_scraping > load_datalake_stg

```
29 def web_scraping():
111
112     @task
113     def load_datalake_stg(df, table_name):
114         # ===== postgres =====
115
116         # DATABASE_URL = "postgresql://ajinusa:ajinusa@ajinusa-de8-postgres:5432/de8_final_project"
117
118         # Membuat engine untuk koneksi ke PostgreSQL
119         # engine = sa.create_engine(DATABASE_URL)
120         engine = PostgresHook("de8_final_project").get_sqlalchemy_engine()
121
122         # Menyimpan DataFrame ke PostgreSQL (untuk tarikan pertama kali)
123         # df.to_sql("carmudi_data_staging", engine, if_exists='replace', index=False)
124
125         # Menyimpan DataFrame ke PostgreSQL (untuk tarikan terupdate halaman 1 dan 2)
126         df.to_sql("carmudi_data_staging", engine, if_exists='append', index=False)
127
128
```

DAGs : Web Scraping

```
def web_scraping():
    def load_datalake(table_name):
        query = """
        with cte_data as (
            select distinct judul, harga, tahun, merek, nama_mobil, kilometer, transmisi, lokasi, dealer, phone_number, max(link) 1
            from carmudi_data_staging
            group by 1,2,3,4,5,6,7,8,9,10
        )

        select * from cte_data a
        """

        df_read_datalake = pd.read_sql(query, connection)

        jakarta_tz = pytz.timezone('Asia/Jakarta')
        df_read_datalake['snapshot_dt'] = pd.to_datetime(datetime.now(jakarta_tz))
        df_read_datalake['snapshot_dt'] = df_read_datalake['snapshot_dt'].dt.tz_convert('Asia/Jakarta').astype(str)

        df_read_datalake.to_sql(table_name, engine, if_exists='replace', index=False)
```

DAGs : Web Scraping



Airflow

DAGs

Cluster Activity

Datasets

Security

Browse

Admin

Docs



15:02 UTC

Log In



DAG: web_scraping

Schedule: 0 0 * * *

Next Run ID: 2025-02-20, 17:00:00 UTC



21/02/2025 15.01.43

All Run Types

All Run States

Clear Filters

Auto-refresh

25

Press **shift** + **/** for Shortcuts

deferred failed queued removed restarting running scheduled shutdown skipped success up_for_reschedule up_for_retry upstream_failed no_status

DAG

Run

Task

web_scraping / 2025-02-21, 14:44:31 UTC / extract_web

Clear task

Mark state as...

Filter DAG by task

Details

Graph

Gantt

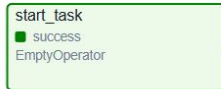
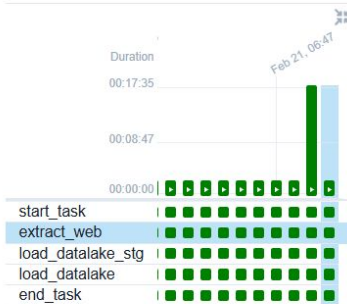
Code

Event Log

Logs

XCom

Task Duration



Layout:

Left -> Right

DAGs : Create Datamart

```
21 def create_datamart():
22
27     @task
28     def read_datalake(table_name):
29         # read postgres
30         engine = PostgresHook("de8_final_project").get_sqlalchemy_engine()
31         try:
32             # Koneksi dan query
33             with engine.connect() as connection:
34                 print("Koneksi ke Postgres berhasil!")
35
36                 query = "SELECT * FROM "+table_name
37
38                 # Menjalankan query dan mengubahnya ke dalam DataFrame
39                 df_read_datalake = pd.read_sql(query, connection)
40                 return df_read_datalake
41
42         except Exception as e:
43             print("Error koneksi:", e)
44
```


DAGs : Create Datamart

```
def create_datamart():
    def load_datamart(df_datalake, table_name):
        def dm_carmudi_mobil_dijual():
            df_result = spark.sql("select nama_mobil, count(*) jumlah from "+table_name+" group by 1 order by 2 desc") # SQL Query
            df_result.show()
            df_result = df_result.toPandas()

            # insert to mysql datamart
            try:
                with engine.connect() as connection:
                    print("Koneksi ke MySQL berhasil!")

                    print(df_result)
                    df_result.to_sql("dm_carmudi_mobil_dijual", con=engine, if_exists='replace', index=False)

            except Exception as e:
                print("Error koneksi:", e)

        def dm_carmudi_mobil_avg():
            df_result = spark.sql("select concat(nama_mobil,\" (\",tahun,\")\") nama_mobil, avg(harga) avg_harga from "+table_name+" group")
            df_result.show()
            df_result = df_result.toPandas()
```


DAGs : Create Datamart



Airflow

DAGs

Cluster Activity

Datasets

Security

Browse

Admin

Docs



15:04 UTC

Log In

DAG: create_datamart

Schedule: 0 1 * * *

Next Run ID: 2025-02-20, 18:00:00 UTC



21/02/2025 15.04.33

All Run Types

All Run States

Clear Filters

Auto-refresh

25

Press **shift** + **/** for Shortcuts

deferred failed queued removed restarting running scheduled shutdown skipped success up_for_reschedule up_for_retry upstream_failed no_status

DAG
create_datamart

Details

Graph

Gantt

Code

Event Log

Run Duration

Task Duration

Calendar

Layout:

Left -> Right

start_task

EmptyOperator

read_datalake

@task

load_datamart

@task

end_task

EmptyOperator

Datalake Overview



SELECT * FROM carmudi_data_staging LIMIT 100

Search Results

Cost: 55ms < 1 2 3 4 ... 186 > Total 18564

Export

	judul text	harga bigint	tahu text	merek text	nama_mobil text	kilometer text	transmisi text	lokasi text	dealer text
>	2015 Mercedes-Benz S400L 3.0 Exclusive Sedan	595000000	2015	Mercedes-Benz	Mercedes-Benz S400L	35 - 40K KM	Automatic	Banten	Deale
>	2018 Honda HR-V 1.5 E Special Edition SUV	253000000	2018	Honda	Honda HR-V	30 - 35K KM	Automatic	Jawa Barat	Deale
>	2022 Mitsubishi Xpander 1.5 Ultimate MPV - TD	229000000	2022	Mitsubishi	Mitsubishi Xpander	30 - 35K KM	Automatic	DKI Jakarta	Deale
>	2014 Honda Odyssey 2.4 Prestige MPV - , UNIT I	250000000	2014	Honda	Honda Odyssey	95 - 100K KM	Automatic	DKI Jakarta	Deale
>	2013 Mercedes-Benz SLK250 1.8 AMG Convertib	735000000	2013	Mercedes-Benz	Mercedes-Benz SLK250	40 - 45K KM	Automatic	Banten	Deale
>	2008 Toyota Corolla Altis 1.8 V Sedan	119500000	2008	Toyota	Toyota Corolla Altis	124000 KM	Automatic	Jawa Barat	Deale
>	2018 Toyota Sienta 1.5 G MPV	179000000	2018	Toyota	Toyota Sienta	30 - 35K KM	Automatic	Yogyakarta	Deale
>	2011 Volkswagen Golf 1.4 TSI Hatchback - , TDP	145000000	2011	Volkswagen	Volkswagen Golf	90 - 95K KM	Automatic	DKI Jakarta	Deale
>	2017 Daihatsu Siga 1.2 R Deluxe MPV	100000000	2017	Daihatsu	Daihatsu Siga	65 - 70K KM	Automatic	DKI Jakarta	Deale

Datalake Overview



```
SELECT * FROM carmudi_data_staging LIMIT 100
```

merek text	nama_mobil text	kilometer text	transmisi text	lokasi text	dealer text	phone_number text	link text	snapshot_dt text
Mercedes-Benz	Mercedes-Benz S400L	35 - 40K KM	Automatic	Banten	Dealer	+6282112769067	https://www.carmudi.co.id/c	2025-02-21 13:53:55
Honda	Honda HR-V	30 - 35K KM	Automatic	Jawa Barat	Dealer	+6282112769067	https://www.carmudi.co.id/c	2025-02-21 13:53:55
Mitsubishi	Mitsubishi Xpander	30 - 35K KM	Automatic	DKI Jakarta	Dealer	+6282112769067	https://www.carmudi.co.id/c	2025-02-21 13:53:55
Honda	Honda Odyssey	95 - 100K KM	Automatic	DKI Jakarta	Dealer	+6282112769067	https://www.carmudi.co.id/c	2025-02-21 13:53:55
Mercedes-Benz	Mercedes-Benz SLK250	40 - 45K KM	Automatic	Banten	Dealer	+6282112769067	https://www.carmudi.co.id/c	2025-02-21 13:53:55
Toyota	Toyota Corolla Altis	124000 KM	Automatic	Jawa Barat	Dealer	+6282112769067	https://www.carmudi.co.id/c	2025-02-21 13:53:55
Toyota	Toyota Sienta	30 - 35K KM	Automatic	Yogyakarta	Dealer	+6282112769067	https://www.carmudi.co.id/c	2025-02-21 13:53:55
Volkswagen	Volkswagen Golf	90 - 95K KM	Automatic	DKI Jakarta	Dealer	+6282112769067	https://www.carmudi.co.id/c	2025-02-21 13:53:55
Daihatsu	Daihatsu Siga	65 - 70K KM	Automatic	DKI Jakarta	Dealer	+6282112769067	https://www.carmudi.co.id/c	2025-02-21 13:53:55

Data Pipeline: Processing & Transformation



Data Pipeline: Processing & Transformation

```
SELECT judul, dealer, harga, kilometer, transmisi, lokasi, phone_number, count(link) total_link
FROM carmudi_data_staging
group by 1,2,3,4,5,6,7 order by 8 desc
```

Search Results 1 Export Cost: 64ms < 1 2 3 4 ... 179 > Total 17864

		judul text	dealer text	harga bigint	kilo text	transm text	lokasi text	phone_number text	total_link
<input type="checkbox"/>	>	2021 Suzuki SX4 S-Cross 1.5 Hatchback	Sales Agent	212000000	85 - 90K	Automatic	Jawa Barat	+6282112769067	5
<input type="checkbox"/>	>	2017 Porsche Panamera 2.9 4S Hatchback	Dealer	2288000000	5 - 10K K	Automatic	DKI Jakarta	+6282112769067	4
<input type="checkbox"/>	>	2019 Nissan Serena 2.0 Highway Star MPV	Dealer	290000000	35 - 40K	Automatic	Jawa Timur	+6282112769067	4
<input type="checkbox"/>	>	2022 Suzuki Ertiga 1.5 Hybrid GX MPV	Sales Agent	203000000	35 - 40K	Automatic	Jawa Barat	+6282112769067	4
<input type="checkbox"/>	>	2023 Mercedes-Benz C300 2.0 AMG Line Sedan	Dealer	935000000	0 - 5K KN	Automatic	DKI Jakarta	+6282112769067	4
<input type="checkbox"/>	>	2024 Toyota Kijang Innova 2.4 G MPV	Sales Agent	370000000	20 - 25K	Manual	Jawa Barat	+6282112769067	4
<input type="checkbox"/>	>	2020 Honda Brio 1.2 Satya E Hatchback	Dealer	135000000	50 - 55K	Automatic	DKI Jakarta	+6282112769067	4
<input type="checkbox"/>	>	2021 Toyota Avanza 1.5 Veloz MPV	Sales Agent	190000000	70 - 75K	Automatic	DKI Jakarta	+6282112769067	4

Data Pipeline: Processing & Transformation



Properties DATA Log ER Monitor

```
SELECT judul, dealer, harga, kilometer, transmisi, lokasi, phone_number, count(link) total_link
FROM carmudi_data
group by 1,2,3,4,5,6,7 order by 8 desc
```

Search Results

Cost: 64ms < 1 2 3 4 ... 179 > Total 17858

		judul text	dealer text	harga bigint	kilometer text	transmisi text	lokasi text	phone_number text	total_link
>		2005 Honda CR-V 2.4 SUV	Private	87000000	135 - 140K KM	Automatic	Jawa Barat	+6282112769067	1
>		2009 Toyota Fortuner 2.5 G	Sales Agent	195000000	200 - 205K KM	Manual	Jawa Timur	+6282112769067	1
>		2021 BMW X1 1.5 sDrive18i	Dealer	535000000	40 - 45K KM	Automatic	DKI Jakarta	+6282112769067	1
>		2021 Mitsubishi Xpander Cr	Dealer	231000000	61284 KM	Automatic	DKI Jakarta	+6282112769067	1
>		2014 Lexus RX 270 2.7 SUV	Dealer	335000000	70 - 75K KM	Automatic	DKI Jakarta	+6282112769067	1
>		2023 Mercedes-Benz C300	Dealer	975000000	0 - 5K KM	Automatic	DKI Jakarta	(NULL)	1
>		2017 Honda BR-V 1.5 S SUV	Dealer	178000000	81098 KM	Manual	Jawa Tengah	+6282112769067	1
>		2004 Toyota Land Cruiser C	Dealer	425000000	140000 KM	Automatic	Sumatera Utara	+6282112769067	1

Data Pipeline: Processing & Transformation

```
✓ localhost@3306 9.2.0
  ✓ de8_final_project 29M
    ✓ Tables (152)
      > dm_carmudi_company 58
      > dm_carmudi_km 1424
      > dm_carmudi_last_update 1
      > dm_carmudi_location 23
      > dm_carmudi_mobil_avg 2101
      > dm_carmudi_mobil_dijual 474
      > dm_carmudi_seller 2
      > dm_carmudi_seller_type 8
      > dm_carmudi_tahun 54
      > dm_carmudi_transmisi 2
      > dm_mobil_terlaris 324
```

Data Visualization

Final Project DE8 - Arifin Satria Ajinusa

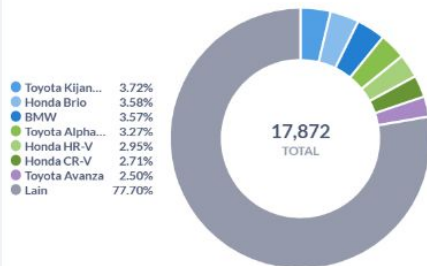
✎ 📄 🕒 📌 ⓘ ...

Dashboard Penjualan Mobil Bekas pada Platform Carmudi.com

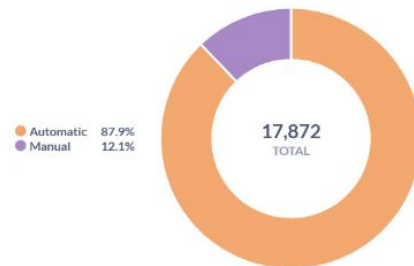
2025-02-21 21:59:20.149976+07:00

Last Updated Data

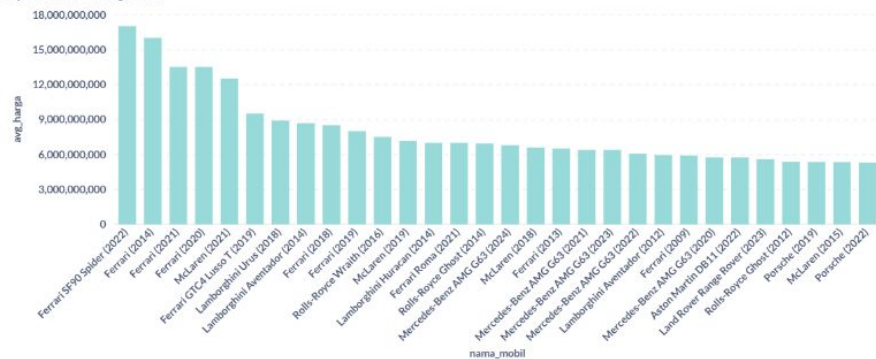
Top 10 Mobil Paling Banyak Dijual



Berdasarkan Transmisi



Top 30 Rata-rata Harga Mobil

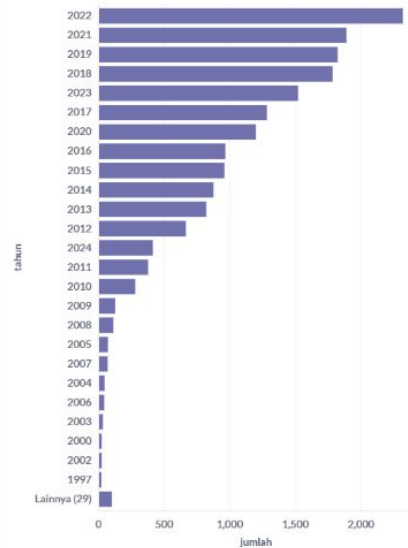


Berdasarkan Tahun Mobil

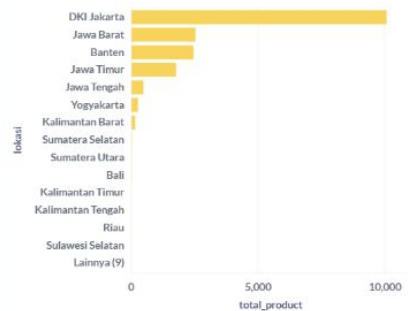


Berdasarkan KM

Berdasarkan Tahun Mobil



Berdasarkan Lokasi Penjual

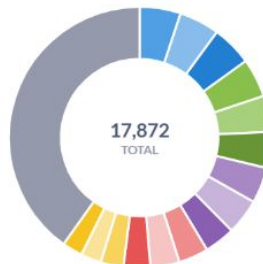


Total produk per Penjual



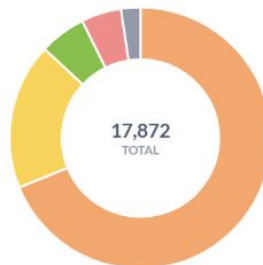
Berdasarkan KM

- 15 - 20K KM 5.07%
- 25 - 30K KM 4.99%
- 0 - 5K KM 4.99%
- 20 - 25K KM 4.79%
- 35 - 40K KM 4.47%
- 5 - 10K KM 4.44%
- 10 - 15K KM 4.43%
- 30 - 35K KM 4.41%
- 45 - 50K KM 3.80%
- 50 - 55K KM 3.69%
- 40 - 45K KM 3.59%
- 55 - 60K KM 3.32%
- 60 - 65K KM 2.84%
- 65 - 70K KM 2.53%
- 70 - 75K KM 2.52%
- Lain 40.12%



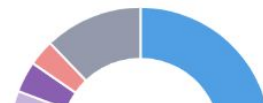
Berdasarkan Tipe Dealer

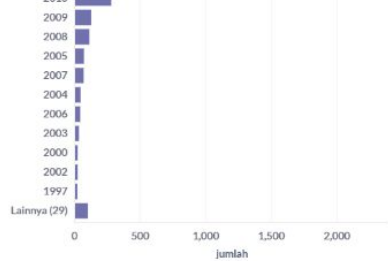
- Dealer Deal... 68.86%
- Sales Agent... 18.07%
- Dealer 5.75%
- Private 4.94%
- Lain 2.38%



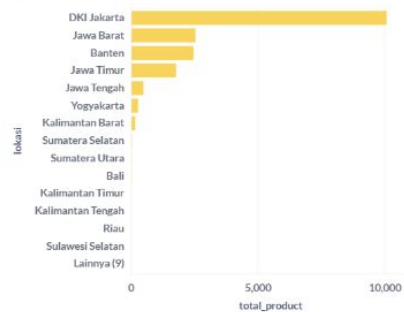
Berdasarkan Pabrikan Mobil

- Toyota 26.48%
- Honda 16.20%
- Mercedes... 10.19%

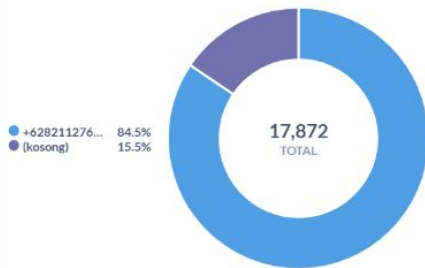




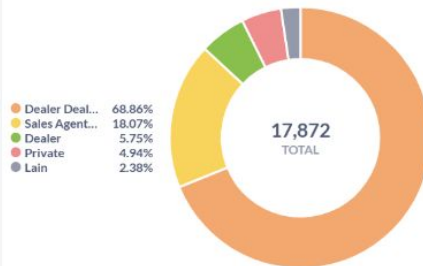
Berdasarkan Lokasi Penjual



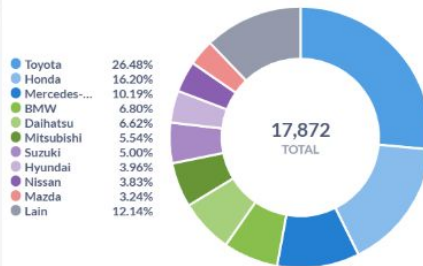
Total produk per Penjual



Berdasarkan Tipe Dealer



Berdasarkan Pabrikan Mobil



Conclusion & Recommendation

Platform yang dibangun dalam proyek ini mampu mengolah, menyimpan, dan menyajikan data penjualan mobil bekas dari Carmudi.co.id secara otomatis dan terstruktur melalui data pipeline. Dengan kombinasi web scraping, Apache Airflow, data warehouse, dan Metabase, sistem ini dapat menyajikan insightful dashboard yang interaktif yang memberikan insight tentang tren harga, distribusi merek, pola penjualan berdasarkan lokasi dan spesifikasi kendaraan, dll.

A large, stylized graphic on the left side of the slide. It consists of a blue outline of a human figure with a large orange circle for the head and a smaller orange circle for the torso, both with concentric circles inside.

**Terima
Kasih.**