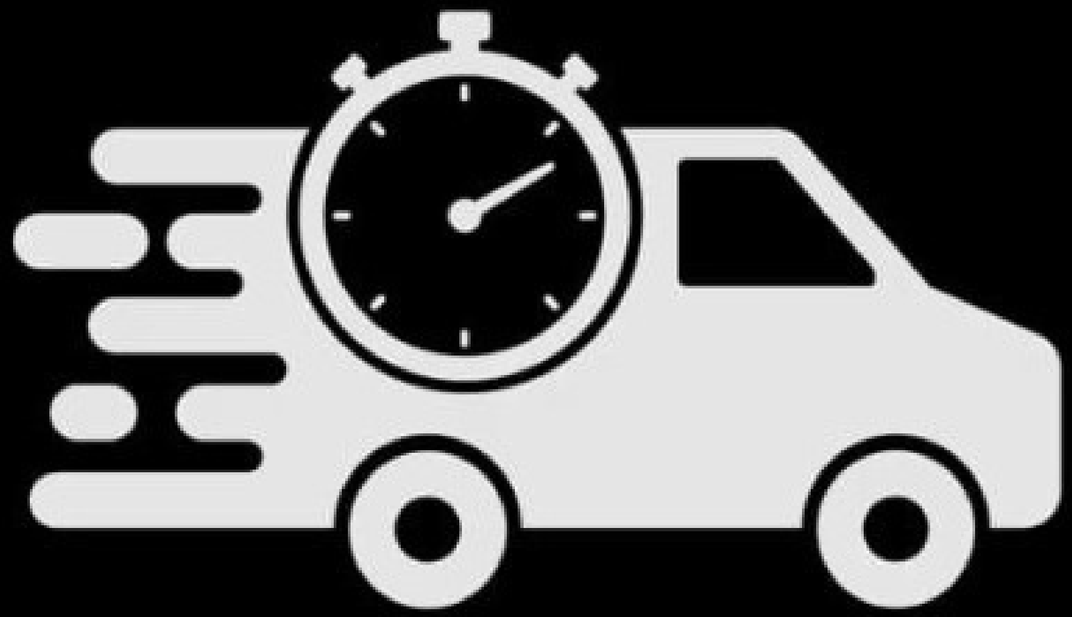
YOUR PACKAGE, OUR PRIORITY

Express Delivery



Express Delivery is a fast and reliable delivery company that connects buyers and sellers across the USA through an easy-to-use app. Catering to both individuals and businesses, it offers seamless, secure, and efficient delivery services, ensuring packages are handled quickly and with confidence.

Entering 2024, the company aims to analyze key data from 2023 to drive improvements and refine business strategies.

- Total sales and revenue
- Monthly delivery volume
- Customer growth and the most active states
- Most popular payment methods
- Top drivers of the year

Company Dataset

DELIVERIES DATA

SHIPMENTS DATA

DRIVERS DATA

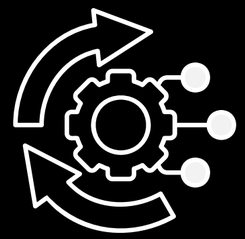
PAYMENTS DATA

CUSTOMERS DATA

ETL Process

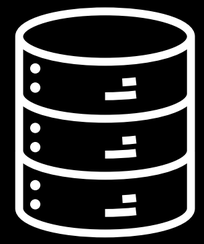
Extract

Extracting the data from multiple sources (csv, xls, json,)



Transform

Cleaning the data and preparing it before loading it to the end target (tool: python)



Load

Load the data into the end target

ETL Python

ETL.py

```python
import pandas as pd
import json

# Paths to input files
csv_drivers_path = "C:\\Users\\dell\\Desktop\\data cleaning\\drivers.csv"
csv_payments_path = "C:\\Users\\dell\\Desktop\\data cleaning\\payments.csv"
excel_deliveries_path = "C:\\Users\\dell\\Desktop\\data cleaning\\deliveries.xlsx"
excel_shipments_path = "C:\\Users\\dell\\Desktop\\data cleaning\\shipments.xlsx"
json_customers_path = "C:\\Users\\dell\\Desktop\\data cleaning\\customers.json"

# Path for the output Excel file
output_excel_path = "C:\\Users\\dell\\Desktop\\data cleaning\\etl data\\cleaned_data.xlsx"

# Load data from files
drivers_df = pd.read_csv(csv_drivers_path)
payments_df = pd.read_csv(csv_payments_path)
deliveries_df = pd.read_excel(excel_deliveries_path)
shipments_df = pd.read_excel(excel_shipments_path)

with open(json_customers_path, 'r') as f:
    customers_data = json.load(f)
customers_df = pd.DataFrame(customers_data)
```

ETL.py

```
23
24  # Cleaning Drivers Table
25  def clean_drivers(df):
26      def extract_name_from_email(row):
27          if pd.isna(row['first_name']) or pd.isna(row['last_name']):
28              first_name, last_name = row['email'].split('@')[0].split('.')
29              return pd.Series({'first_name': first_name, 'last_name': last_name})
30          return pd.Series({'first_name': row['first_name'], 'last_name': row['last_name']})
31
32      missing_names = df[df['first_name'].isna() | df['last_name'].isna()]
33      df.update(missing_names.apply(extract_name_from_email, axis=1))
34      return df
35
36  drivers_df = clean_drivers(drivers_df)
37
38  # Cleaning Payments Table
39  def clean_payments(payments_df, deliveries_df, shipments_df):
40      def determine_payment_method(row):
41          if pd.isna(row['payment_method']):
42              delivery_date = deliveries_df.loc[deliveries_df['delivery_id'] == row['delivery_id'], 'delivery_date']
43              if not delivery_date.empty and delivery_date.iloc[0] == row['payment_date']:
44                  return "cash"
45              return "paypal/credit card"
46          return row['payment_method']
47
48      def calculate_payment_amount(row):
49          if pd.isna(row['payment_amount']):
50              delivery_cost = deliveries_df.loc[deliveries_df['delivery_id'] == row['delivery_id'], 'delivery_cost'].fill
51              item_price = shipments_df.loc[shipments_df['shipment_id'] == row['shipment_id'], 'item_price'].fillna(0)
52              return delivery_cost.iloc[0] + item_price.iloc[0] if not delivery_cost.empty and not item_price.empty else
53          return row['payment_amount']
54
55      payments_df['payment_method'] = payments_df.apply(determine_payment_method, axis=1)
56      payments_df['payment_amount'] = payments_df.apply(calculate_payment_amount, axis=1)
57      return payments_df
58
59  payments_df = clean_payments(payments_df, deliveries_df, shipments_df)
```

```python
# Cleaning Deliveries Table
def clean_deliveries(deliveries_df, payments_df, shipments_df):
    def calculate_delivery_cost(row):
        if pd.isna(row['delivery_cost']):
            payment_amount = payments_df.loc[payments_df['delivery_id'] == row['delivery_id'], 'payment_amount'].fillna(0)
            item_price = shipments_df.loc[shipments_df['delivery_id'] == row['delivery_id'], 'item_price'].fillna(0)
            return payment_amount.iloc[0] - item_price.iloc[0] if not payment_amount.empty and not item_price.empty else 0
        return row['delivery_cost']

    deliveries_df['delivery_cost'] = deliveries_df.apply(calculate_delivery_cost, axis=1)
    return deliveries_df

deliveries_df = clean_deliveries(deliveries_df, payments_df, shipments_df)

# Cleaning Shipments Table
def clean_shipments(shipments_df, payments_df):
    def calculate_item_price(row):
        if pd.isna(row['item_price']):
            payment_amount = payments_df.loc[payments_df['shipment_id'] == row['shipment_id'], 'payment_amount'].fillna(0)
            other_prices = shipments_df.loc[(shipments_df['delivery_id'] == row['delivery_id']) & (shipments_df['shipment_id'] != row['shipı
            return payment_amount.iloc[0] - other_prices.sum() if not payment_amount.empty else 0
        return row['item_price']

    shipments_df['item_price'] = shipments_df.apply(calculate_item_price, axis=1)
    return shipments_df

shipments_df = clean_shipments(shipments_df, payments_df)

# Cleaning Customers Table
```

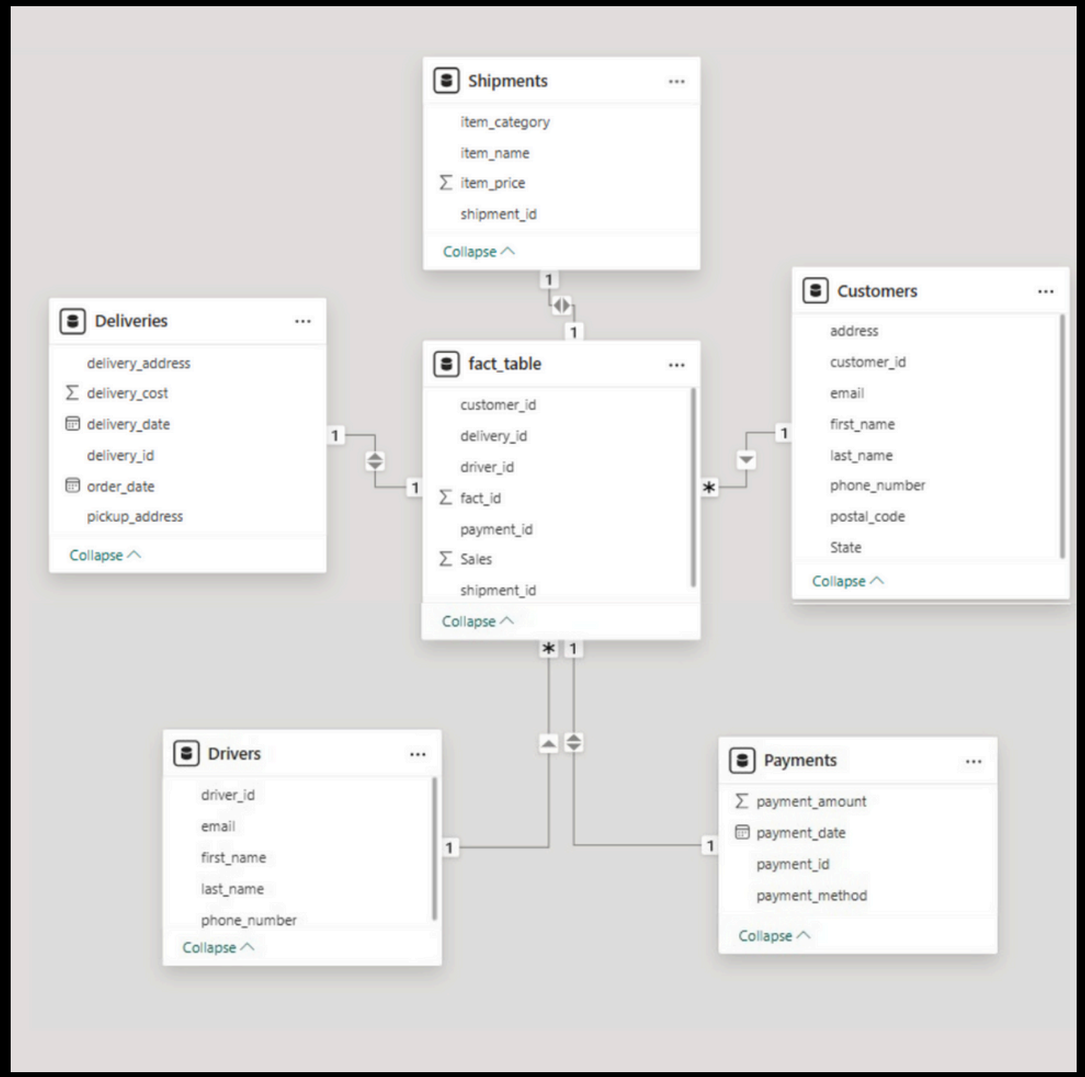
```
91
92  # Writing cleaned data to an Excel file
93  with pd.ExcelWriter(output_excel_path, engine='openpyxl') as writer:
94      customers_df.to_excel(writer, index=False, sheet_name='Customers')
95      drivers_df.to_excel(writer, index=False, sheet_name='Drivers')
96      payments_df.to_excel(writer, index=False, sheet_name='Payments')
97      shipments_df.to_excel(writer, index=False, sheet_name='Shipments')
98      deliveries_df.to_excel(writer, index=False, sheet_name='Deliveries')
99
100 print(f"Cleaned data has been saved to {output_excel_path}")
101
```

Output

15	Amy	Adkins	amy.adkins@example.com
16	Christine	Barnes	christine.barnes@example.com
17	Natasha	Wood	natasha.wood@example.com
18	Grace	Farrell	grace.farrell@example.com

Customers | Drivers | Payments | Shipments | Deliveries

Star Schema


Shipments
item_category
item_name
item_price
shipment_id
Collapse
Deliveries
delivery_address
delivery_cost
delivery_date
delivery_id
order_date
pickup_address
Collapse
fact_table
customer_id
delivery_id
driver_id
fact_id
payment_id
Sales
shipment_id
Collapse
Customers
address
customer_id
email
first_name
last_name
phone_number
postal_code
State
Collapse
Drivers
driver_id
email
first_name
last_name
phone_number
Collapse
Payments
payment_amount
payment_date
payment_id
payment_method
Collapse
1
*

Data Loading

SQL ROLAP

```python
import pandas as pd
import mysql.connector

# Database connection setup
def create_connection(database=None):
    if database:
        return mysql.connector.connect(
            host="localhost",
            user="root",
            password="islemsmiila*332-W",
            database=database
        )
    else:
        return mysql.connector.connect(
            host="localhost",
            user="root",
            password="islemsmiila*332-W"
        )

# Create database and tables
def setup_database():
    conn = create_connection()
    cursor = conn.cursor()

    # Create database if it doesn't exist
    cursor.execute("CREATE DATABASE IF NOT EXISTS deliveryexpress")
```

Data Loading

SQL ROLAP

loading data.py ×

```
27      conn.commit()  # Commit the creation of the database
28
29      # Now connect to the specific database
30      conn = create_connection("deliveryexpress")
31      cursor = conn.cursor()
32
33      # Create tables
34      tables = {
35          "Customers": """
36              CREATE TABLE IF NOT EXISTS Customers (
37                  customer_id INT PRIMARY KEY,
38                  first_name VARCHAR(255),
39                  last_name VARCHAR(255),
40                  email VARCHAR(255),
41                  phone_number VARCHAR(20),
42                  address VARCHAR(255),
43                  postal_code VARCHAR(20),
44                  state VARCHAR(50)
45              )
46          """,
47          "Payments": """
48              CREATE TABLE IF NOT EXISTS Payments (
49                  payment_id INT PRIMARY KEY,
50                  payment_amount DECIMAL(10, 2),
51                  payment_method VARCHAR(50)
52              )
```

Data Loading

SQL ROLAP

loading data.py ×

```
53          """,
54          "Drivers": """
55              CREATE TABLE IF NOT EXISTS Drivers (
56                  driver_id INT PRIMARY KEY,
57                  first_name VARCHAR(255),
58                  last_name VARCHAR(255),
59                  email VARCHAR(255),
60                  phone_number VARCHAR(20)
61              )
62          """,
63          "Shipments": """
64              CREATE TABLE IF NOT EXISTS Shipments (
65                  shipment_id INT PRIMARY KEY,
66                  item_category VARCHAR(50),
67                  item_name VARCHAR(255),
68                  item_price DECIMAL(10, 2)
69              )
70          """,
71          "Deliveries": """
72              CREATE TABLE IF NOT EXISTS Deliveries (
73                  delivery_id INT PRIMARY KEY,
74                  delivery_address VARCHAR(255),
75                  pickup_address VARCHAR(255),
76                  delivery_cost DECIMAL(10, 2)
77              )
78          """,
```

Data Loading

SQL ROLAP

loading data.py ×

```
78          """,
79          "fact_table": """
80              CREATE TABLE IF NOT EXISTS fact_table (
81                  fact_id INT AUTO_INCREMENT PRIMARY KEY,
82                  customer_id INT DEFAULT 0,
83                  payment_id INT DEFAULT 0,
84                  driver_id INT DEFAULT 0,
85                  shipment_id INT DEFAULT 0,
86                  delivery_id INT DEFAULT 0,
87                  Sales DECIMAL(10, 2) DEFAULT 0,
88                  FOREIGN KEY (customer_id) REFERENCES Customers(customer_id),
89                  FOREIGN KEY (payment_id) REFERENCES Payments(payment_id),
90                  FOREIGN KEY (driver_id) REFERENCES Drivers(driver_id),
91                  FOREIGN KEY (shipment_id) REFERENCES Shipments(shipment_id),
92                  FOREIGN KEY (delivery_id) REFERENCES Deliveries(delivery_id)
93              )
94          """
95      }
96
97      for table_name, table_query in tables.items():
98          cursor.execute(table_query)
99
100     conn.commit()
101     conn.close()
102
103 # Insert data from Excel to MySQL
```

Data Loading

SQL ROLAP

loading data.py

```python
# Insert data from Excel to MySQL
def insert_data_from_excel(file_path):
    conn = create_connection("deliveryexpress")  # Connect to the 'deliveryexpress' database
    cursor = conn.cursor()

    # Read each sheet and insert data
    sheets = ["Customers", "Payments", "Drivers", "Shipments", "Deliveries"]
    for sheet in sheets:
        df = pd.read_excel(file_path, sheet_name=sheet)

        # Filter columns that match table structure
        cursor.execute(f"DESCRIBE {sheet}")
        table_columns = [row[0] for row in cursor.fetchall()]
        df = df[[col for col in df.columns if col in table_columns]]

        # Insert data into the table
        for _, row in df.iterrows():
            placeholders = ", ".join(["%s"] * len(row))
            columns = ", ".join(row.index)
            sql = f"INSERT INTO {sheet} ({columns}) VALUES ({placeholders})"
            cursor.execute(sql, tuple(row))

    conn.commit()
    conn.close()

# Populate fact table
```

Data Loading

SQL ROLAP

```
# Populate fact table
def populate_fact_table():
    conn = create_connection("deliveryexpress")  # Connect to the 'deliveryexpress' database
    cursor = conn.cursor()

    # Get the maximum number of rows across dimensions
    cursor.execute("SELECT COUNT(*) FROM Customers")
    customer_count = cursor.fetchone()[0]

    cursor.execute("SELECT COUNT(*) FROM Payments")
    payment_count = cursor.fetchone()[0]

    cursor.execute("SELECT COUNT(*) FROM Drivers")
    driver_count = cursor.fetchone()[0]

    cursor.execute("SELECT COUNT(*) FROM Shipments")
    shipment_count = cursor.fetchone()[0]

    cursor.execute("SELECT COUNT(*) FROM Deliveries")
    delivery_count = cursor.fetchone()[0]

    max_rows = max(customer_count, payment_count, driver_count, shipment_count, delivery_count)

```

Data Loading

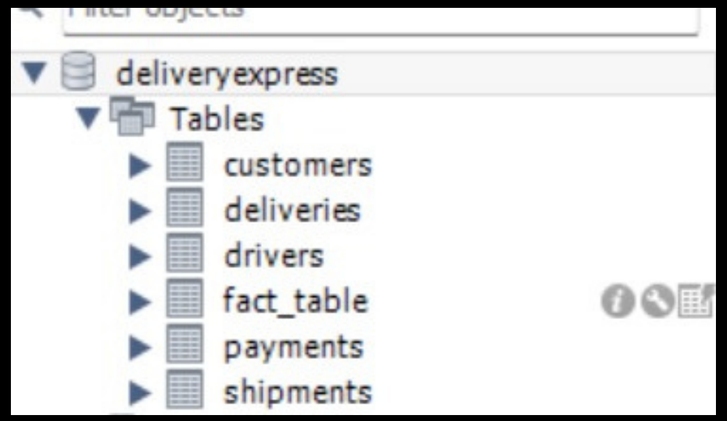
SQL ROLAP

loading data.py * ×

```
    # Insert rows into fact table
    for i in range(max_rows):
        cursor.execute("""
            INSERT INTO fact_table (customer_id, payment_id, driver_id, shipment_id, delivery_id, Sales)
            VALUES (
                IFNULL((SELECT customer_id FROM Customers LIMIT %s, 1), 0),
                IFNULL((SELECT payment_id FROM Payments LIMIT %s, 1), 0),
                IFNULL((SELECT driver_id FROM Drivers LIMIT %s, 1), 0),
                IFNULL((SELECT shipment_id FROM Shipments LIMIT %s, 1), 0),
                IFNULL((SELECT delivery_id FROM Deliveries LIMIT %s, 1), 0),
                IFNULL((SELECT delivery_cost FROM Deliveries LIMIT %s, 1), 0)
            )
        """, (i, i, i, i, i, i))

    conn.commit()
    conn.close()

# Main function
def main():
    file_path = "C:\\Users\\dell\\Desktop\\data cleaning\\etl data\\cleaned_data.xlsx"

    setup_database()
    insert_data_from_excel(file_path)
    populate_fact_table()

if __name__ == "__main__":
    main()
```

Data Loading

OUTPUT



Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

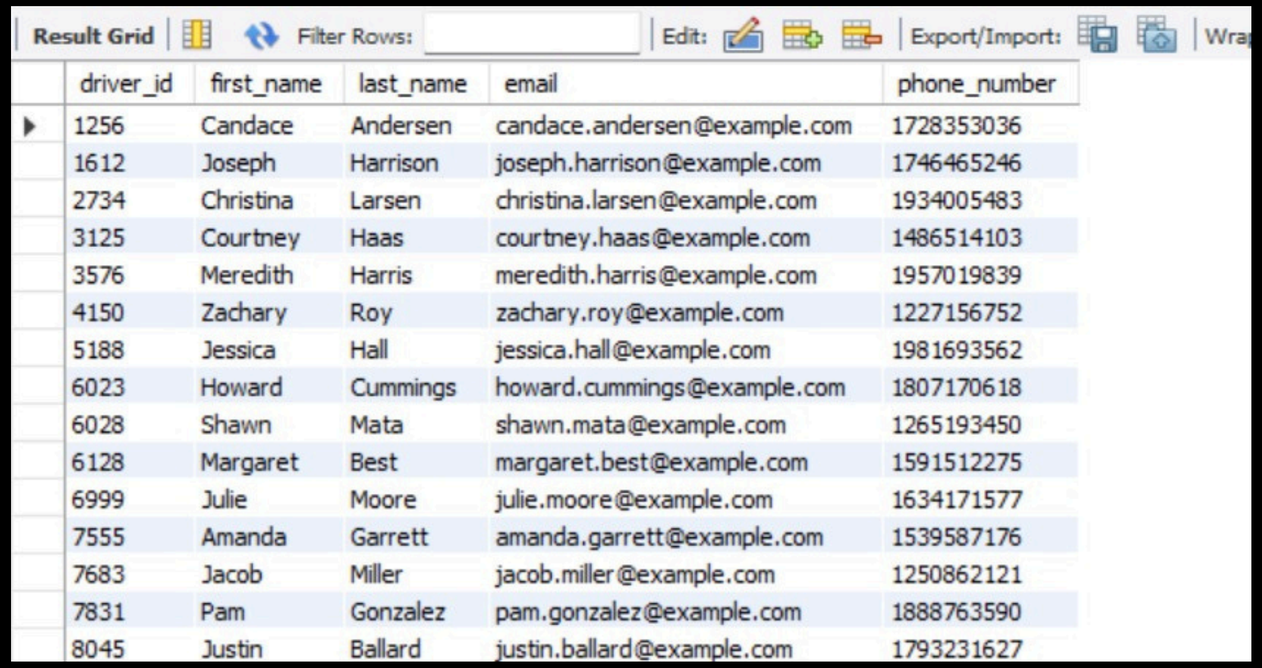
customer_id	first_name	last_name	email	phone_number	address	state	postal_code
97	David	Powell	david.powell@example.com	+1664087343	578 Kimberly Turn...	Iowa	76659
193	Rebecca	Fields	rebecca.fields@example.com	+1912906014	8469 Gonzalez Spri...	Virginia	45624
436	Denise	Curry	denise.curry@example.com	+1229700073	67291 Montgomer...	Wyoming	51921
511	Adam	Lane	adam.lane@example.com	+1362735441	656 Simpson Well ...	Indiana	03476
528	Sara	Duncan	sara.duncan@example.com	+1155020303	78502 Nathan Driv...	Utah	82646
569	Keith	Stanton	keith.stanton@example.com	+1164612445	USCGC Nelson, FP...	Missouri	46562
589	Dalton	Osborn	dalton.osborn@example.com	+1690012837	970 Natalie Shoals ...	Arkansas	01518
933	Christina	Lopez	christina.lopez@example.com	+1953802075	3088 Mark Brooks ...	Arkansas	45807
1019	Jason	Allen	jason.allen@example.com	+1484105725	11154 Harvey Stre...	Rhode Island	96892
1149	William	Price	william.price@example.com	+1937768549	1210 Jennifer Har...	Indiana	89342
1363	Andrew	Morgan	andrew.morgan@example.com	+1588092694	504 Allen Well Apt....	Georgia	93058
1504	Albert	Clark	albert.clark@example.com	+1372987211	06166 Carpenter ...	Tennessee	12950
2031	Jeffery	Rhodes	jeffery.rhodes@example.com	+1110423086	1871 Mann Turnpik...	North Carolina	01781
2151	Gina	Sanchez	gina.sanchez@example.com	+1565608900	844 Willis Ridge Ap...	Louisiana	93221
2187	Isaac	Singh	isaac.singh@example.com	+1231348586	67949 Mccullough ...	North Carolina	83923
2235	Travis	Davis	travis.davis@example.com	+1224206458	82341 Smith Spur, ...	Ohio	46841

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

delivery_id	delivery_address	pickup_address	delivery_cost
261	0920 Daniel Plains, Matthewfurt, CO 64705	186 Thompson Way Suite 756, New Anita, PW ...	39.26
659	37820 Hannah Manor, North Douglas, OR 03087	43840 Katie Mission Apt. 573, Ricetown, SD 58...	42.96
710	3365 Torres Gardens Apt. 249, North Rachelshi...	31867 Wendy Neck, Bethview, KY 97732	36.38
784	21977 Chan Port, Lake Whitney, SD 07110	Unit 1692 Box 7592, DPO AA 41071	35.54
817	58454 Traci Trail, South Kayla, KY 24852	793 Morgan Trail, Lake Shawn, DC 63181	50.66
826	511 James Mount Suite 497, Benjaminport, NC ...	575 Schmidt Lodge, New David, GU 04780	51.22
840	PSC 3737, Box 6989, APO AA 56478	60670 Benitez Crossroad, Anthonyberg, OH 28...	45.13
1268	273 Rivera Spur Apt. 090, Lloydland, IA 85625	2731 Kathy Mill, Bellchester, NM 24839	46.67
1287	05726 Linda Village, East Lori, WI 18052	078 May Hollow Suite 364, Joneston, GA 58120	53.01
1742	53900 Calhoun Station, Oconnellfort, VT 93254	883 Smith Parks Suite 581, Walkertown, MO 30...	65.84
1813	40430 King Vista, Bennettberg, IL 95296	817 Anthony Gardens, Theodorefurt, MI 55799	50.75
2117	799 Emily Tunnel Apt. 707, South Amandamout...	Unit 8137 Box 6742, DPO AP 56053	54.51
2780	6278 Chad Crossroad, Port Joshua, RI 89986	32741 Scott Glen Apt. 255, Port Derek, CA 82251	66.16
2880	397 Rose Skyway Suite 900, South Emilyton, S...	95145 Rachel Valleys, West Ericahaven, FM 84...	44.40
3508	1182 Shari Port, North Luisberg, SD 39544	72444 Cummings Crest Apt. 269, Shariport, SD ...	55.03

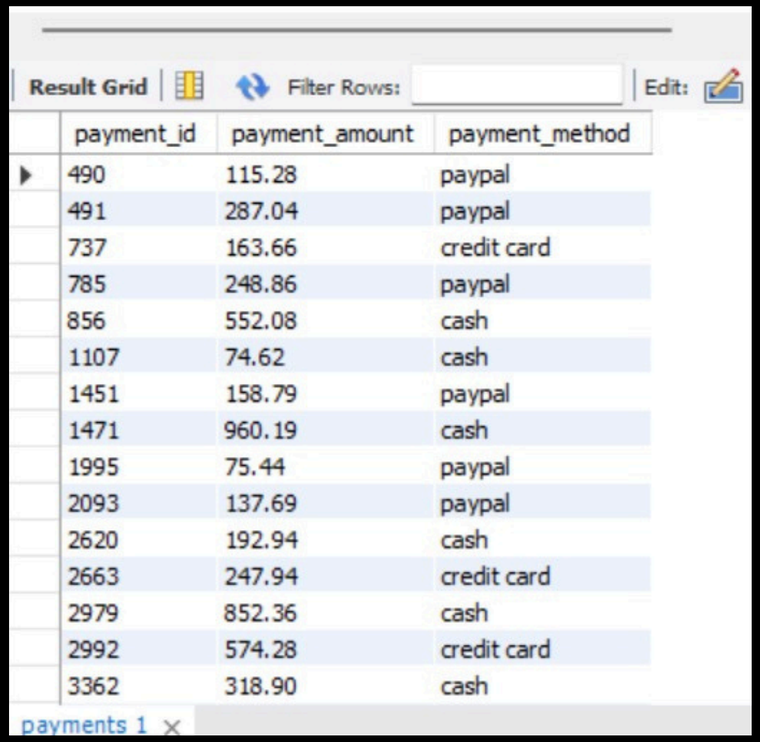
Data Loading

OUTPUT



Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap

driver_id	first_name	last_name	email	phone_number
1256	Candace	Andersen	candace.andersen@example.com	1728353036
1612	Joseph	Harrison	joseph.harrison@example.com	1746465246
2734	Christina	Larsen	christina.larsen@example.com	1934005483
3125	Courtney	Haas	courtney.haas@example.com	1486514103
3576	Meredith	Harris	meredith.harris@example.com	1957019839
4150	Zachary	Roy	zachary.roy@example.com	1227156752
5188	Jessica	Hall	jessica.hall@example.com	1981693562
6023	Howard	Cummings	howard.cummings@example.com	1807170618
6028	Shawn	Mata	shawn.mata@example.com	1265193450
6128	Margaret	Best	margaret.best@example.com	1591512275
6999	Julie	Moore	julie.moore@example.com	1634171577
7555	Amanda	Garrett	amanda.garrett@example.com	1539587176
7683	Jacob	Miller	jacob.miller@example.com	1250862121
7831	Pam	Gonzalez	pam.gonzalez@example.com	1888763590
8045	Justin	Ballard	justin.ballard@example.com	1793231627



Result Grid | Filter Rows: | Edit:

payment_id	payment_amount	payment_method
490	115.28	paypal
491	287.04	paypal
737	163.66	credit card
785	248.86	paypal
856	552.08	cash
1107	74.62	cash
1451	158.79	paypal
1471	960.19	cash
1995	75.44	paypal
2093	137.69	paypal
2620	192.94	cash
2663	247.94	credit card
2979	852.36	cash
2992	574.28	credit card
3362	318.90	cash

payments 1

Data Loading

OUTPUT

Result Grid | Filter Rows: | Edit:

shipment_id	item_category	item_name	item_price
131	electronics	Tablet	623.61
173	clothes	Sweater	98.86
350	furniture	Wardrobe	343.55
550	book and education	E-Reader	68.78
600	sports and outdoors	Backpack	117.86
1150	book and education	Textbook	166.48
1214	electronics	Laptop	391.91
1350	book and education	E-Reader	46.86
1731	beauty and personal care	Perfume	160.52
2078	book and education	Novel	70.72
2118	clothes	Jacket	174.51
2444	furniture	Sofa	488.74
2847	beauty and personal care	Perfume	71.79
3120	beauty and personal care	Makeup Kit	193.98

fact_id	customer_id	payment_id	driver_id	shipment_id	delivery_id	sales
1	288389	261600	509476	757779	64672	64.42
2	231148	557068	387622	890889	961228	60.50
3	396922	802730	814571	571196	702431	63.20
4	716751	656274	114898	510013	966528	60.84
5	69403	257584	182317	605270	944022	62.27
6	449245	324561	740042	669079	141173	34.24
7	988210	395517	189907	765584	592216	43.76
8	669987	368008	316408	861013	408096	41.54
9	509597	331567	408950	101551	774301	52.27
10	259947	468930	803463	996335	705078	63.75
11	224643	327717	214757	985755	514922	36.63
12	292075	169822	374635	176091	436644	64.11
13	409386	294523	487925	168514	638267	53.15
14	59942	706358	639694	875588	986744	31.74
15	612024	167751	855937	533904	152663	67.21
16	165409	890425	98754	87756	574910	32.61
17	529959	730697	443581	785606	912475	62.87

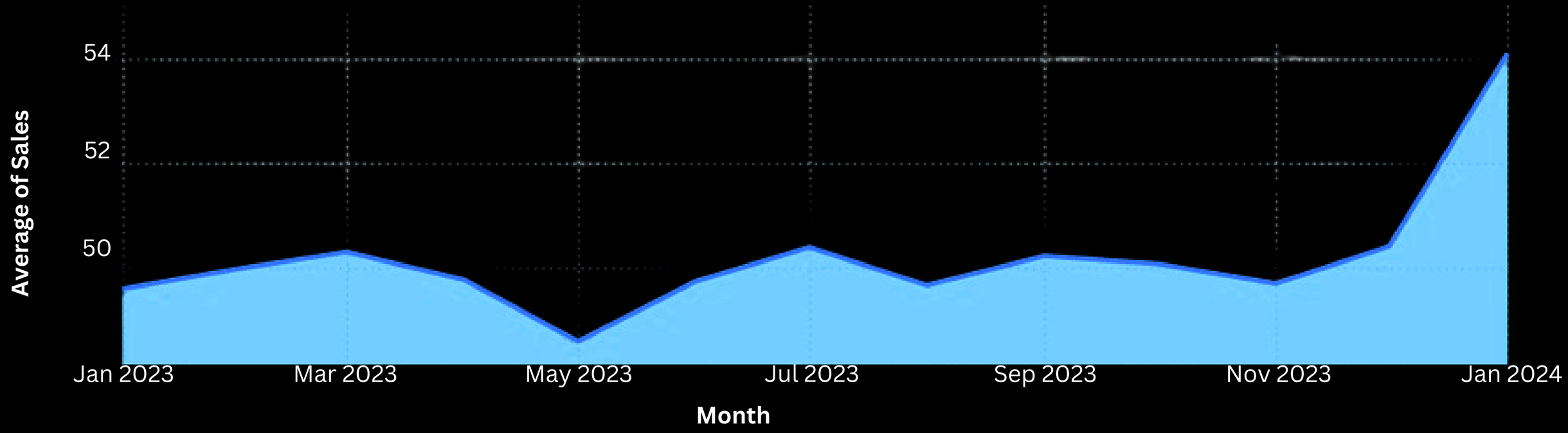
PAGE 21

Performance Dashboard

POWER BI

Customers	Total Revenue in $	Number of drivers	Total Deliveries
4000	249.36 K	2600	5000

Average of Sales by Month

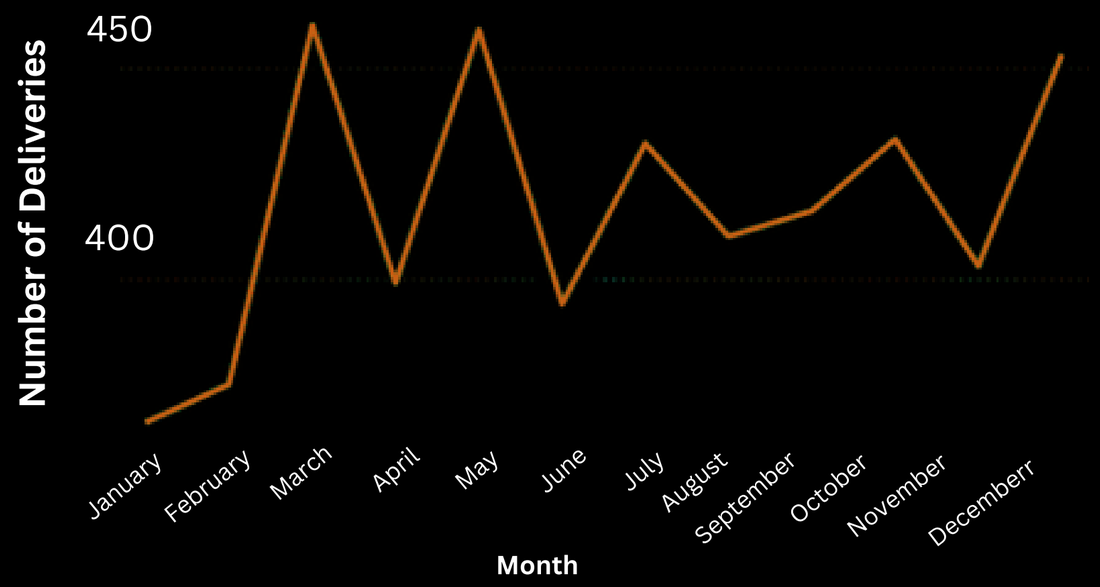


PAGE 22

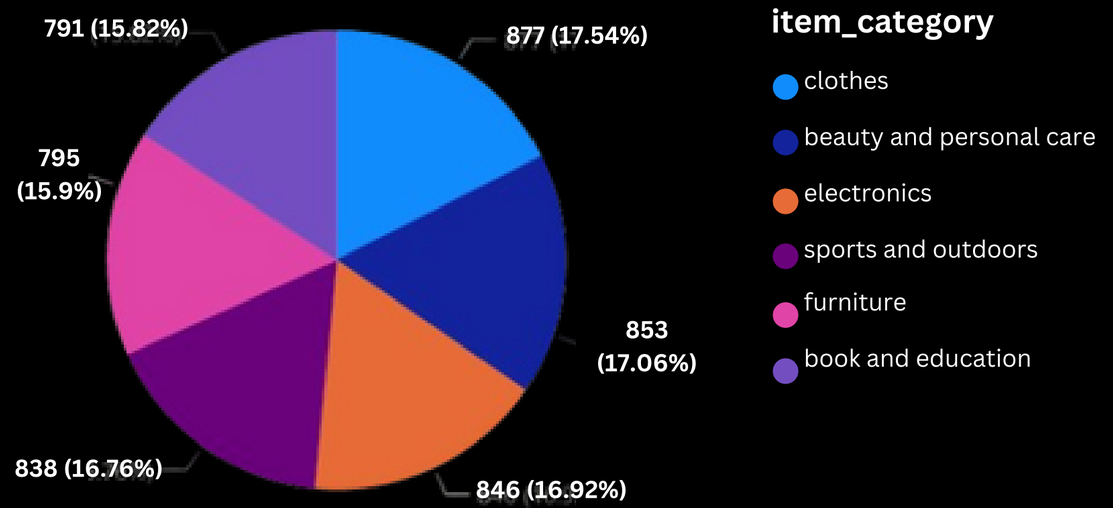
Performance Dashboard

POWER BI

Number of Deliveries by Month



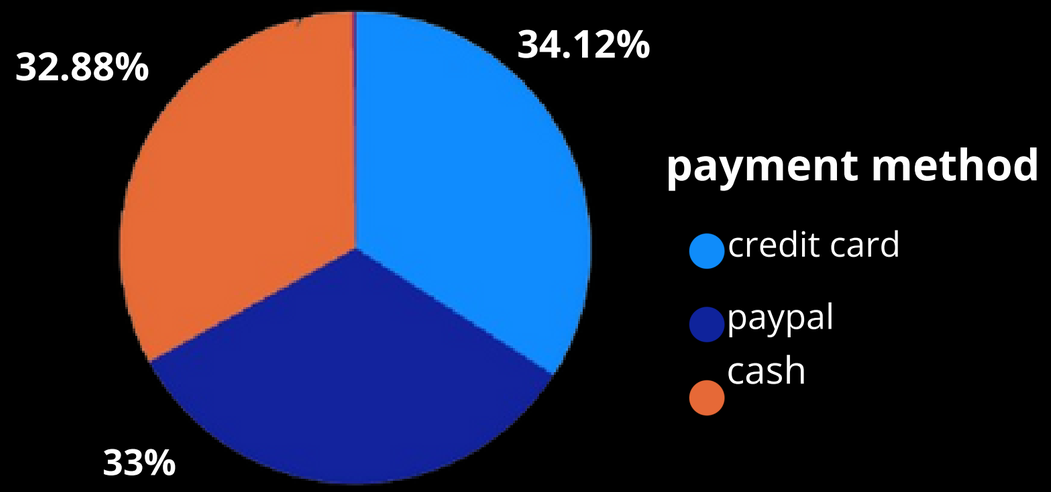
Total Number of Deliveries by item_category



Performance Dashboard

POWER BI

Percentage of payments by payment method



Percentage of Drivers by Item_category

Payment_method	Total number of payments per each method
Cash	1641
Credit Card	1707
Paypal	1652
Total	**5000**

THANK YOU!