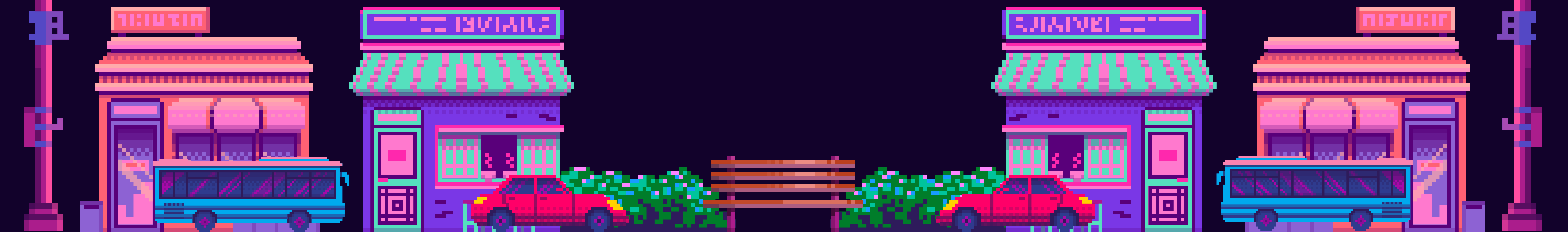
VIDEO GAMES SALES DATA PIPELINE

Mostafa Mohamed Ismail



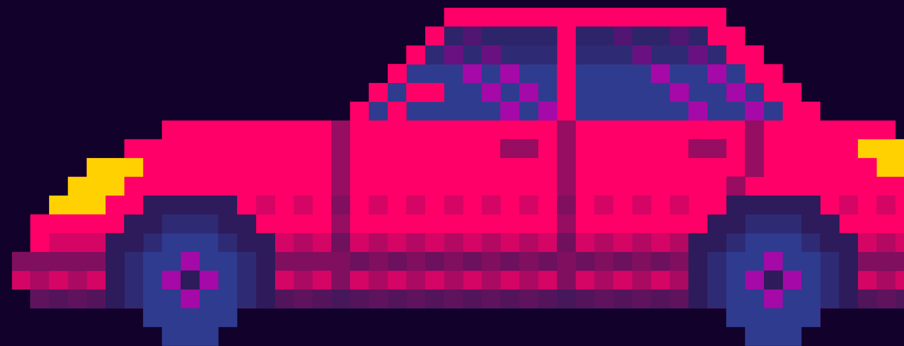
PROBLEM STATEMENT

Raw data contains issues:

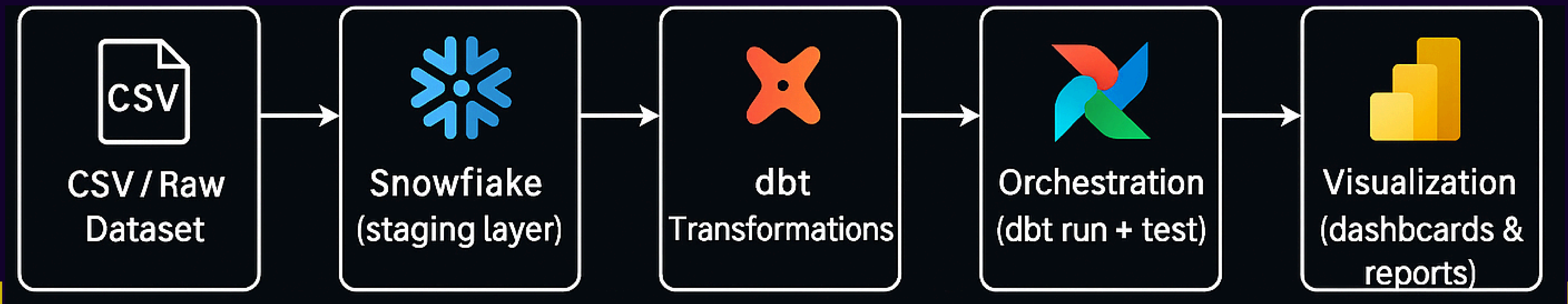
- "N/A" values instead of numbers
- Missing values
- Different data formats

Business needs:

- Clean data
- Automated pipeline
- Easy visualization for insights



DATA PIPELINE ARCHITECTURE



CSV / Raw Dataset → Snowfiake (staging layer) → dbt Transformations → Orchestration (dbt run + test) → Visualization (dashbcards & reports)

🧹 DATA CLEANING

01 Removed incomplete rows

- Dropped records with missing values in critical fields (Name, Platform, Year, Genre, Publisher, Sales).

02 Enforced correct data types

- Converted Rank and Year into integers.
- Converted Sales values into floats for accurate calculations.

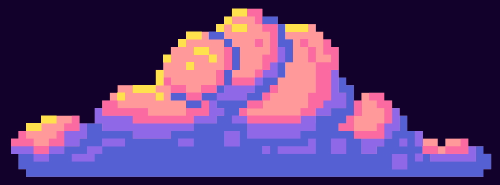
03 Handled missing values

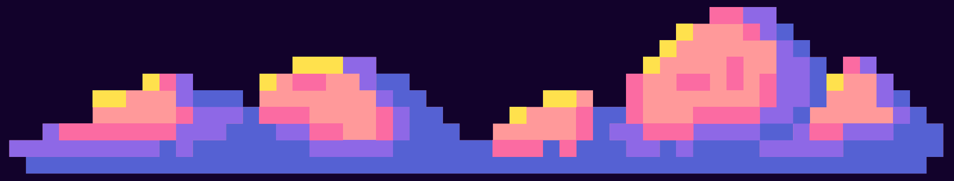
- Replaced any remaining null sales values with 0.0 using COALESCE.

04 Standardized column names

- Renamed raw columns into meaningful business terms (e.g., na_sales → North America Sales (M)).

DATA MODELING





★ WHY STAR SCHEMA?

01 Simplicity

- Easy to understand: one Fact table (sales) linked to multiple Dimension tables (games, publishers, platforms, time).

02 Query Performance

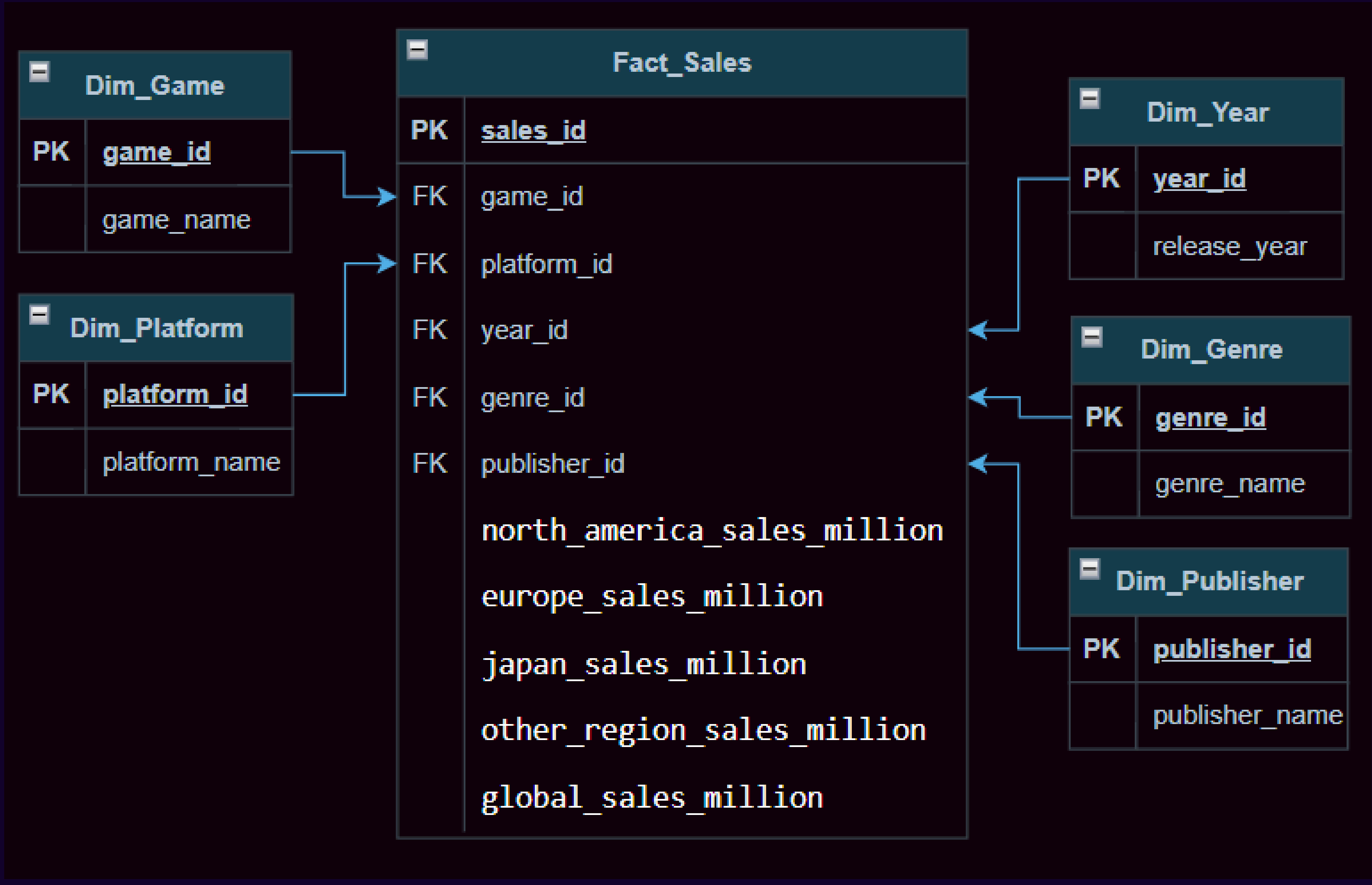
- Optimized for analytical queries in Snowflake & Power BI (fewer joins, faster aggregations).

03 Flexibility in Analysis

- Allows slicing and dicing data by Year, Platform, Genre, Publisher, etc.

04 Best Practice in Data Warehousing

- Star schema is the industry standard for BI tools like Power BI, Tableau.



Dim_Game	
PK	game_id
	game_name

Dim_Platform	
PK	platform_id
	platform_name

Fact_Sales	
PK	sales_id
FK	game_id
FK	platform_id
FK	year_id
FK	genre_id
FK	publisher_id
	north_america_sales_million
	europe_sales_million
	japan_sales_million
	other_region_sales_million
	global_sales_million

Dim_Year	
PK	year_id
	release_year

Dim_Genre	
PK	genre_id
	genre_name

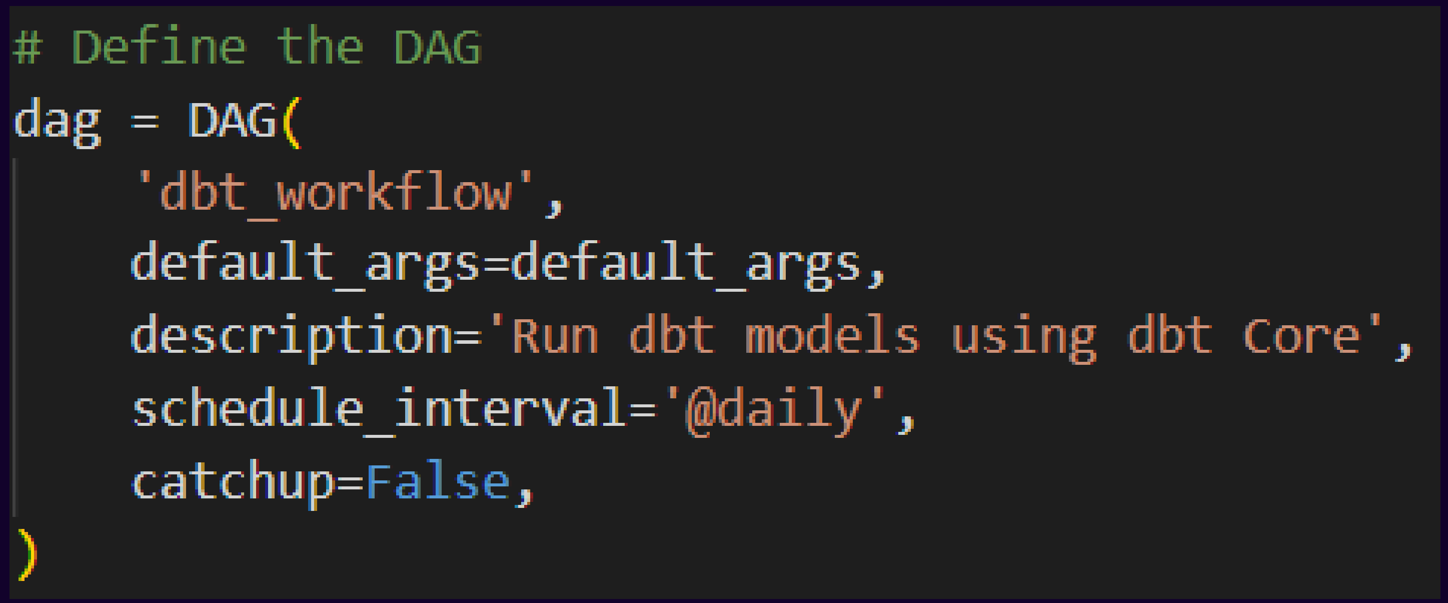
Dim_Publisher	
PK	publisher_id
	publisher_name

AUTOMATION

01

DAG Definition

- Name: dbt_workflow
- Runs daily (@daily).

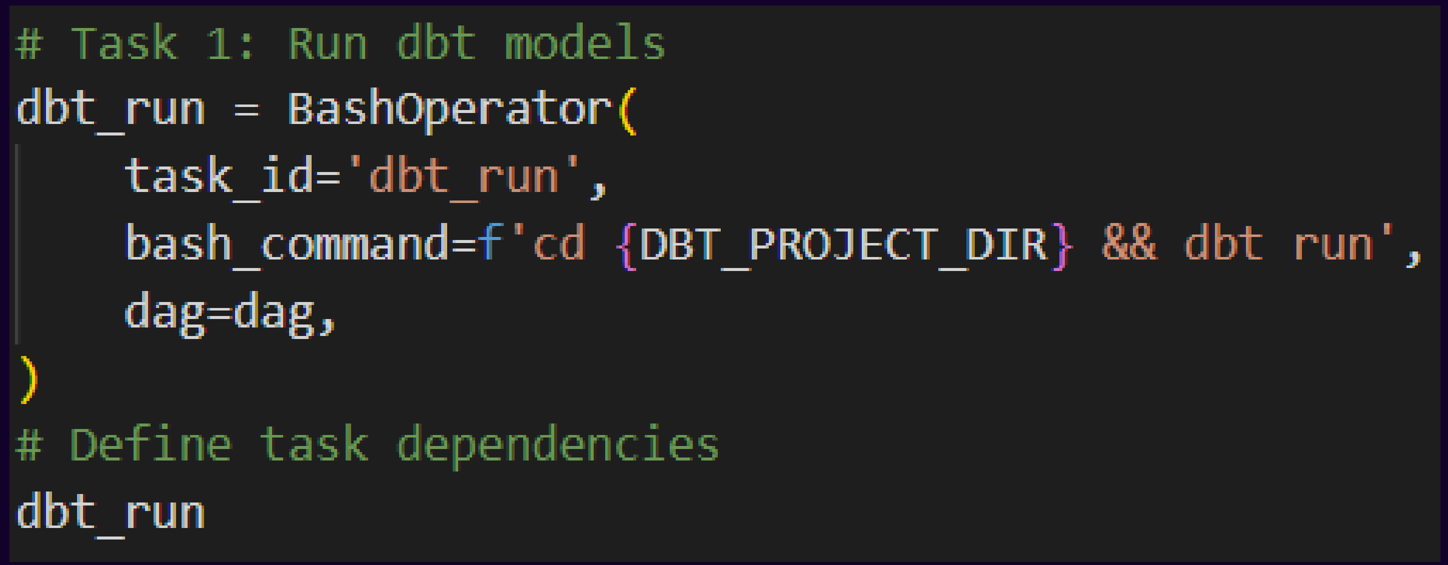


```
# Define the DAG
dag = DAG(
    'dbt_workflow',
    default_args=default_args,
    description='Run dbt models using dbt Core',
    schedule_interval='@daily',
    catchup=False,
)
```

02

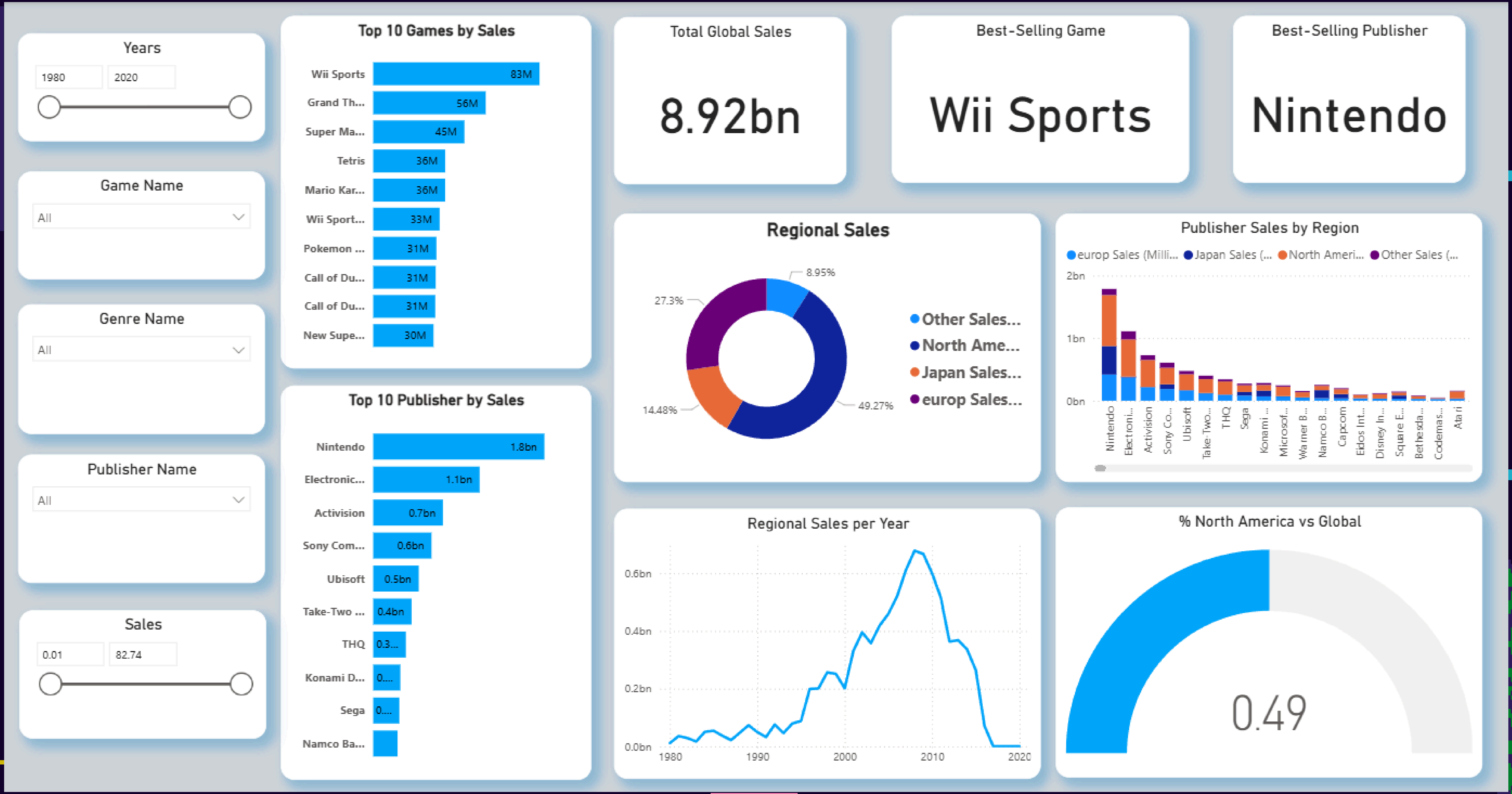
Task: Run dbt Models

- Executes dbt run command inside the project directory.
- Builds and refreshes data models in Snowflake.



```
# Task 1: Run dbt models
dbt_run = BashOperator(
    task_id='dbt_run',
    bash_command=f'cd {DBT_PROJECT_DIR} && dbt run',
    dag=dag,
)
# Define task dependencies
dbt_run
```

DASHBOARD (POWER BI)



Years
1980 2020

Game Name
All

Genre Name
All

Publisher Name
All

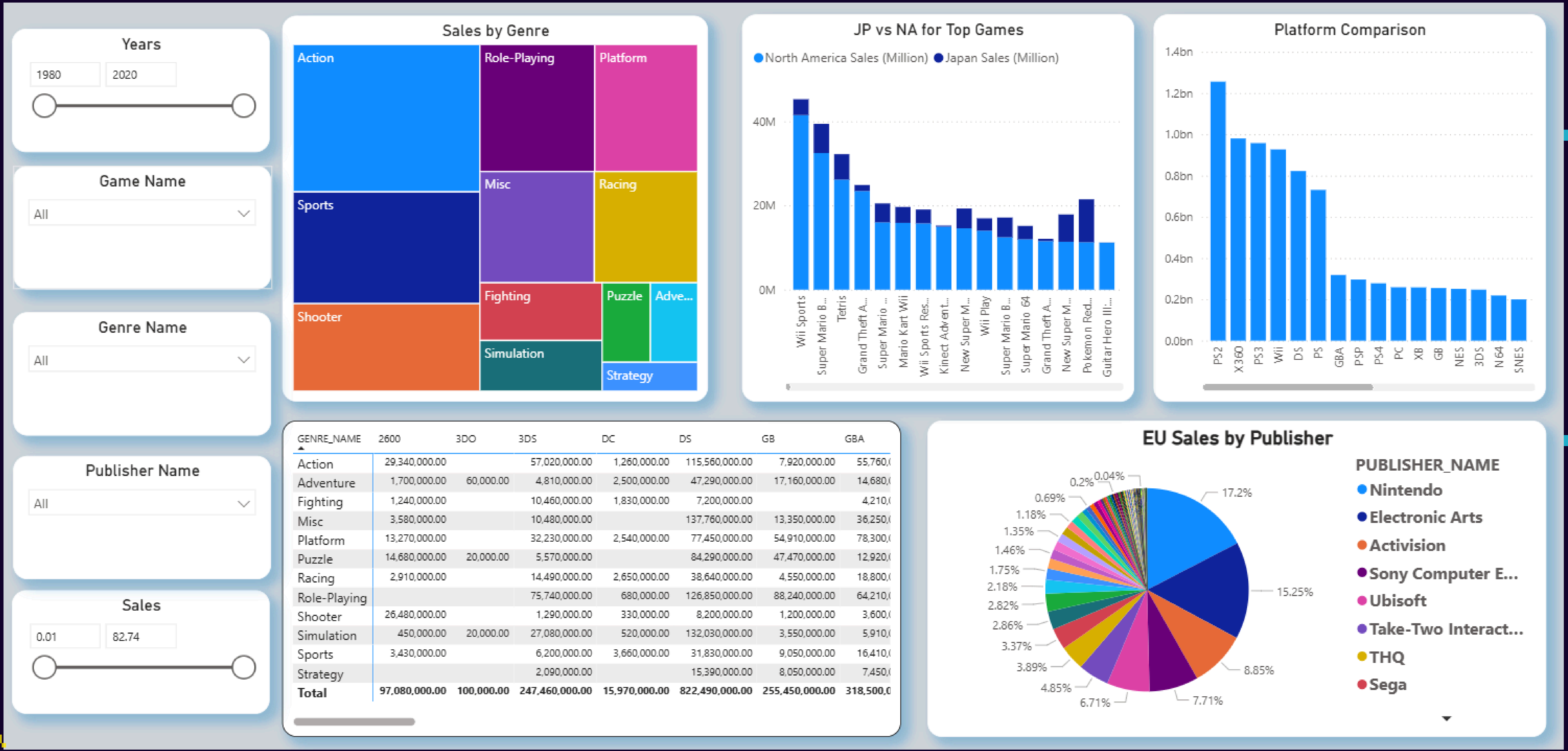
Sales
0.01 82.74

Total Global Sales
8.92bn

Best-Selling Game
Wii Sports

Best-Selling Publisher
Nintendo

DASHBOARD (POWER BI)



Years

1980 2020

Game Name

All

Genre Name

All

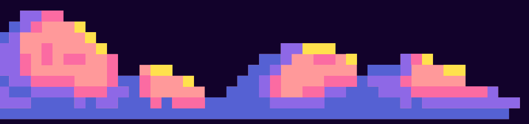
Publisher Name

All

Sales

0.01 82.74

GENRE_NAME	2600	3DO	3DS	DC	DS	GB	GBA
Action	29,340,000.00		57,020,000.00	1,260,000.00	115,560,000.00	7,920,000.00	55,760,
Adventure	1,700,000.00	60,000.00	4,810,000.00	2,500,000.00	47,290,000.00	17,160,000.00	14,680,
Fighting	1,240,000.00		10,460,000.00	1,830,000.00	7,200,000.00		4,210,
Misc	3,580,000.00		10,480,000.00		137,760,000.00	13,350,000.00	36,250,
Platform	13,270,000.00		32,230,000.00	2,540,000.00	77,450,000.00	54,910,000.00	78,300,
Puzzle	14,680,000.00	20,000.00	5,570,000.00		84,290,000.00	47,470,000.00	12,920,
Racing	2,910,000.00		14,490,000.00	2,650,000.00	38,640,000.00	4,550,000.00	18,800,
Role-Playing			75,740,000.00	680,000.00	126,850,000.00	88,240,000.00	64,210,
Shooter	26,480,000.00		1,290,000.00	330,000.00	8,200,000.00	1,200,000.00	3,600,
Simulation	450,000.00	20,000.00	27,080,000.00	520,000.00	132,030,000.00	3,550,000.00	5,910,
Sports	3,430,000.00		6,200,000.00	3,660,000.00	31,830,000.00	9,050,000.00	16,410,
Strategy			2,090,000.00		15,390,000.00	8,050,000.00	7,450,
Total	**97,080,000.00**	**100,000.00**	**247,460,000.00**	**15,970,000.00**	**822,490,000.00**	**255,450,000.00**	**318,500,**



CHALLENGES & SOLUTIONS

01 Data quality issues → Solved by cleaning (null removal, type casting, handling N/A).

02 Large raw data → Automated with Airflow + dbt.

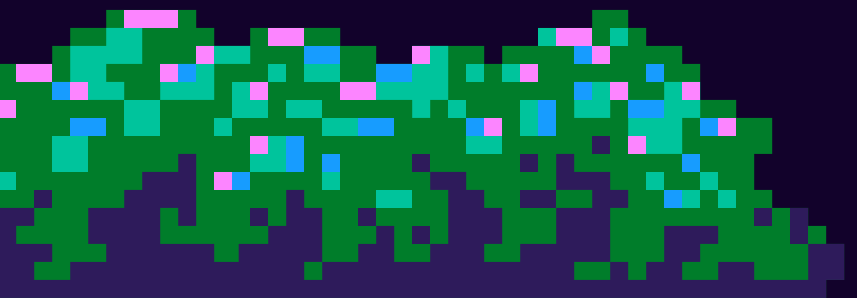
03 Business understanding → Visualized in Power BI.

CONCLUSION

01 Built an end-to-end data pipeline: raw → cleaned → Snowflake → Power BI.

02 Automated pipeline with Airflow.

03 Designed Star Schema for analytics.



THANK YOU