**🟢 Beginner–Intermediate Projects**

1️⃣ **🎧 Spotify Playlist Dynamics Tracker**  
Stream play event webhooks via Kafka, batch process counts in Airflow, and snapshot trends in Snowflake.

2️⃣ **✈️ Flight Price History Archiver**  
Poll Skyscanner/Google Flights APIs daily via Airflow, structure itinerary data, and build historical dataset in Snowflake.  
*Tools: Airflow → Python → Snowflake Time Travel*  
*AWS: SQS (task queuing)*

3️⃣ **🎮 Multi-Platform Game Release Tracker**  
Scrape Steam/Epic/Xbox store pages with Python, detect new releases via change data capture, and sync to Snowflake.  
*Tools: Python (BeautifulSoup) → Kafka → Snowpipe*  
*AWS: ECR (Dockerized scrapers)*

4️⃣ **🗃️ AWS S3 to Redshift Incremental Load Orchestrator**  
Detect new S3 files, transform with Python in Docker tasks, and load deltas into Redshift via Airflow.

5️⃣ **📊 YouTube Metadata Pipeline**  
Use Airflow to pull YouTube API JSON, flatten nested structures into a star schema via Python & AWS Glue, and load incrementally into Snowflake.

6️⃣ **💬 On-Demand YouTube Comments Archiver**  
Fetch comments via Python, queue in Kafka, batch ingest into Snowflake, and schedule runs with Airflow.

7️⃣ **🌦️ Global Weather Data Hub**  
Ingest NOAA/OpenWeatherMap APIs with NiFi, unify schemas across sources, and load to Snowflake for climate trend analysis.  
*Tools: NiFi → Python (schema matching) → Snowflake*  
*AWS: Glue (cataloging)*

**🟡 Intermediate Projects**

8️⃣ **🛍️ Geo-Fenced Retail Analytics Dashboard**  
Enrich purchase logs with geodata in NiFi, stream through Kafka, and aggregate in Snowflake for BI.

9️⃣ **🔌 EV Charging Station Availability System**  
Poll charging network APIs with Airflow, stream live status to Kafka, and expose real-time SQL views in Snowflake for route planners.

🔟 **💳 Credit Card Transaction Anomaly Feeder**  
Consume Visa/Mastercard event streams via Kafka, flag high-risk transactions using SQL rules, and load to Snowflake for auditor dashboards.  
*Tools: Kafka → Snowflake Streams → Materialized Views*  
*AWS: KMS (encryption)*

1️⃣1️⃣ **🔐 Real-Time GDPR Compliance Pipeline**  
Ingest user data streams from Kafka, auto-redact PII with AWS Lambda/Python, and load sanitized records into Snowflake with audit logs.

1️⃣2️⃣ **📈 Crypto Exchange Order Book Synchronizer**  
Stream order book data from Binance/Kraken APIs via Kafka, normalize bid/ask spreads with Python, and maintain real-time tables in Snowflake.  
*Tools: Kafka → Python UDFs → Snowflake Tasks*  
*AWS: EC2 (Kafka brokers)*

1️⃣3️⃣ **🕹️ Real-Time e-Sports Match Telemetry Pipeline**  
Ingest game event streams via Kafka, transform with NiFi, and store/query high-velocity data in Snowflake.

1️⃣4️⃣ **🏃‍♂️ Real-Time Player Fatigue Model**  
Stream match stats via Kafka, compute fatigue indicators in Python, and store rolling metrics in Snowflake for coaches.

1️⃣5️⃣ **🚨 Dynamic Ad Click Fraud Detector**  
Stream click events through Kafka, run Python UDF anomaly detection, and archive flagged records in Snowflake.

1️⃣6️⃣ **⚙️ Serverless ML Model Retrainer**  
Schedule Airflow DAGs to trigger AWS Lambda retrains on fresh Snowflake data and version models in S3.

1️⃣7️⃣ **🛫 Real-Time Flight Delay Predictor**  
Ingest airline status APIs through NiFi, feature engineer in Python, serve live delay forecasts, and store scores in Snowflake.

**🔴 Advanced Projects**

1️⃣8️⃣ **🎲 Real-Time Sports Betting Odds Analyzer**  
Ingest live odds from bookmaker APIs via Kafka, process streaks/arbitrage with PySpark, and store in Snowflake for dynamic dashboards.

1️⃣9️⃣ **🎤 Live Concert Demand Forecasting**  
Stream Ticketmaster event data through Kafka, enrich with Spotify API popularity metrics, and train Snowflake ML models to predict ticket demand spikes.

2️⃣0️⃣ **🧊 Real-Time NFT Trading Monitor**  
Consume blockchain event streams with Kafka, transform in Python, schedule cleanup DAGs, and store in Snowflake.

2️⃣1️⃣ **⚡ Real-Time Energy Market Arbitrage**  
Ingest live market prices via Kafka, compute spreads in Python, orchestrate trades in Airflow, and log to Snowflake.

2️⃣2️⃣ **⛓️ Block-to-SQL Blockchain Indexer**  
Parse Ethereum blocks to relational tables using Python, handle chain reorganizations, and sync to Snowflake via S3 stages.  
*Tools: Web3.py → S3 → Snowpipe*  
*AWS: S3 Lifecycle (data tiering)*

2️⃣3️⃣ **📰 Real-Time Stock News Correlator**  
Ingest SEC filings via Kafka, merge with Bloomberg feeds using NiFi, and store timestamped events in Snowflake for regulatory analysis.  
*Tools: Kafka → NiFi → Snowflake*  
*AWS: S3 (raw storage)*