AI-Based Data Engineer & Database Administrator Training

8-Week Professional Training Program

This hybrid program empowers professionals to master both traditional RDBMS (Oracle, Postg

Week 1 – Foundations of Data Engineering & Database Ecosystem
- Modern data stack: OLTP vs OLAP, batch vs streaming
- RDBMS, NoSQL, NewSQL concepts
- PostgreSQL vs Oracle architecture comparison
- On-prem vs Cloud database operations
- Intro to Cloud SQL, BigQuery, AlloyDB

Week 2 – SQL Mastery & Data Modeling Essentials
- ANSI SQL vs vendor-specific SQL (PL/SQL, PL/pgSQL)
- Schema design, normalization best practices
- Time-series, document, and graph models
- Primary key vs surrogate key decisions
- Hands-on schema design workshop

Week 3 – PostgreSQL & Oracle DBA Foundations
- Installation & architecture comparison
- Tablespaces, segments, transaction handling
- User/role/security policy configuration
- Backup/recovery: RMAN, pg_basebackup
- Index tuning & constraint strategies

Week 4 – Google Cloud Managed Database Services
- Cloud SQL basics and AlloyDB overview
- BigQuery for analytics
- Firestore, Bigtable, Datastore comparison
- IAM, VPC, and Cloud Audit Logs for security

Week 5 – AI-Powered Data Engineering with Vector Databases
- Vector DBs: what and why?
- pgvector for semantic search
- Using LLMs for data enrichment
- Fraud detection & similarity search
- Storing model outputs in databases

Week 6 – Data Pipelines & Automation in the Cloud
- ETL vs ELT
- Cloud Functions & Pub/Sub
- dbt for data transformation
- Apache Airflow basics
- Intro to DataOps

Week 7 – Monitoring, Logging & Performance Tuning
- Oracle AWR/ASH vs PostgreSQL stats
- Query plan and performance tuning
- Prometheus + Grafana setup
- Google Cloud Monitoring & Logging
- Alerting and cost tracking

Week 8 – Capstone Project & AI-Driven Architecture
- Design an AI-ready hybrid data platform
- PostgreSQL to BigQuery pipeline
- Vector embedding and LLM inference
- Final project presentation & review
- Career guidance & Q&A