Day - 1

- Usage of initdb command
- Concept and structure of database cluster
- Template database

- Usage of database management commands

- About postgresql.conf
- How to set pg_hba.conf
- Usage of SET / SHOW

- C
  - Usage of various backup commands
  - File system level backup and restore
  - Concepts and procedures of Point-in-Time Recovery (PITR)
  - Transaction log (WAL) and WAL archive
  - pg_start_backup () / pg_stop_backup ()
  - Usage of COPY statement (SQL) and \copy command (psql)

- C
  - Starting and stopping PostgreSQL
  - Concept of database role / user
  - Adding, deleting and modifying database role / user
  - Purpose and usage of VACUUM and ANALYZE
  - Autovacuum concepts and behavior
  - System information functions
  - Information schema and system catalogs
  - Table privileges (GRANT / REVOKE)

Day - 2

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  - SELECT statement
  - INSERT statement
  - UPDATE statement
  - DELETE statement
  - Datatypes
  - Table definition
  - Index
  - View
  - Materialized view
  - Rule
  - Trigger
  - Sequence
  - Schema
  - Table space
  - Partition
  - Function definition / Procedure definition
  - PL / pgSQL

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  - Aggregate functions
  - Mathematical functions
  - Operators
  - String functions
  - String operators
  - Date/Time functions

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  - Transaction syntax
  - Transaction isolation level (read committed, repeatable read, serializable)
  - LOCK statement
  - Row-level locks and table locks
  - Deadlock

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  - Estimation of table / index size

  - Security

  - Encryption of communication route (SSL)

  - Data encryption

  - Client authentication

  - Audit log

  - Bootstrap Windows Nodes

  - Running the Cookbooks

Day - 3

- Backup, PITR
  - VACUUM, ANALYZE, REINDEX
  - Autovacuum
  - Checkpoint
  - Server log management
  - Disk space monitoring
  - Difference between automatic VACUUM and manual VACUUM / ANALYZE

- Architecture of database cluster
  - Database processes
  - Physical structure of data and data files

- Overview of streaming replication feature and logical replication feature
  - Synchronous and asynchronous replication
  - Settings of postgresql.conf and recovery.conf
  - Definition of publications and subscriptions

- pg_locks
  - pg_stat_activity, pg_stat_database
  - Row-level statistics, ex. pg_stat_all_tables
  - Block level statistics, ex. pg_statio_all_tables

- pg_class
  - pg_stats
  - Real file and path of table index
  - Statistics and parameters used during execution planning

Day - 4

- EXPLAIN / EXPLAIN ANALYZE output
    - EXPLAIN / EXPLAIN ANALYZE output
    - Planning type
    - Tuning from EXPLAIN
    - Type of join (Nested Loop, Hash, Merge) and performance characteristics
    - Execution plan corresponding to SQL syntax (JOIN / GROUP BY / ORDER BY / LIMIT)
    - Execution plan corresponding to SQL with aggregate function (sum / count)
    - Execution plan corresponding to SQL for partition
    - Execution plan corresponding to parallel query
    - Execution plan corresponding to SQL of window function (row_number / rank etc.)

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    - Detecting slow queries
    - Analysis using contrib tools
    - Performance degradation factors (resource exhaustion, lock contention)

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    - RESOURCE USAGE
    - WRITE AHEAD LOG
    - QUERY TUNING
    - RUNTIME STATISTICS
    - LOCK MANAGEMENT
    - Light and heavy locks

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    - Tuning parameters
    - Tuning the execution plan
    - Tuning SQL
    - Tuning the table configuration
    - Distributing disk I/O
    - How to reflect parameters (action required for parameter activation)
    - How indexes affect SQL performance
    - Index Only Scan and Visibility Map

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  - Dealing with server down, malfunction and data loss
  - OS resource exhaustion
  - OS parameters
  - Server process status (idle, idle in transaction, active)
  - Effects on server process by signal (TERM / INT / HUP)
  - Server process crashes (segmentation faults, etc.) and scope of impact

Day - 5

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  - Transaction log recovery
  - System table index recovery
  - Developer options
  - Real file and path of table index
  - Relfilenode and OID
  - Index corruption and REINDEX recovery
  - Checksum corruption detection and recovery
  - Transaction ID rounding error

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  - Streaming replication and logical replication
  - Error messages in log files
  - Processing that is/isn't propagated to the standby
  - How to restart primary PostgreSQL at stop/failure
  - How to restart standby PostgreSQL at stop/failure
  - Processing that is/isn't propagated to logical replication subscribers
  - Conflicts at Logical Replication Subscribers

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  - Orafce
  - Pg Pool II
  - Oracle_fdw
  - Pg_statsinfo
  - Pg_hint_plan
  - Pg_dbms_stats
  - Pg_repack
  - Pg_rman
  - pgBadger
  - pg_bigm
  - PostgreSQL JDBC driver
  - psqlODBC
  - Npgsql