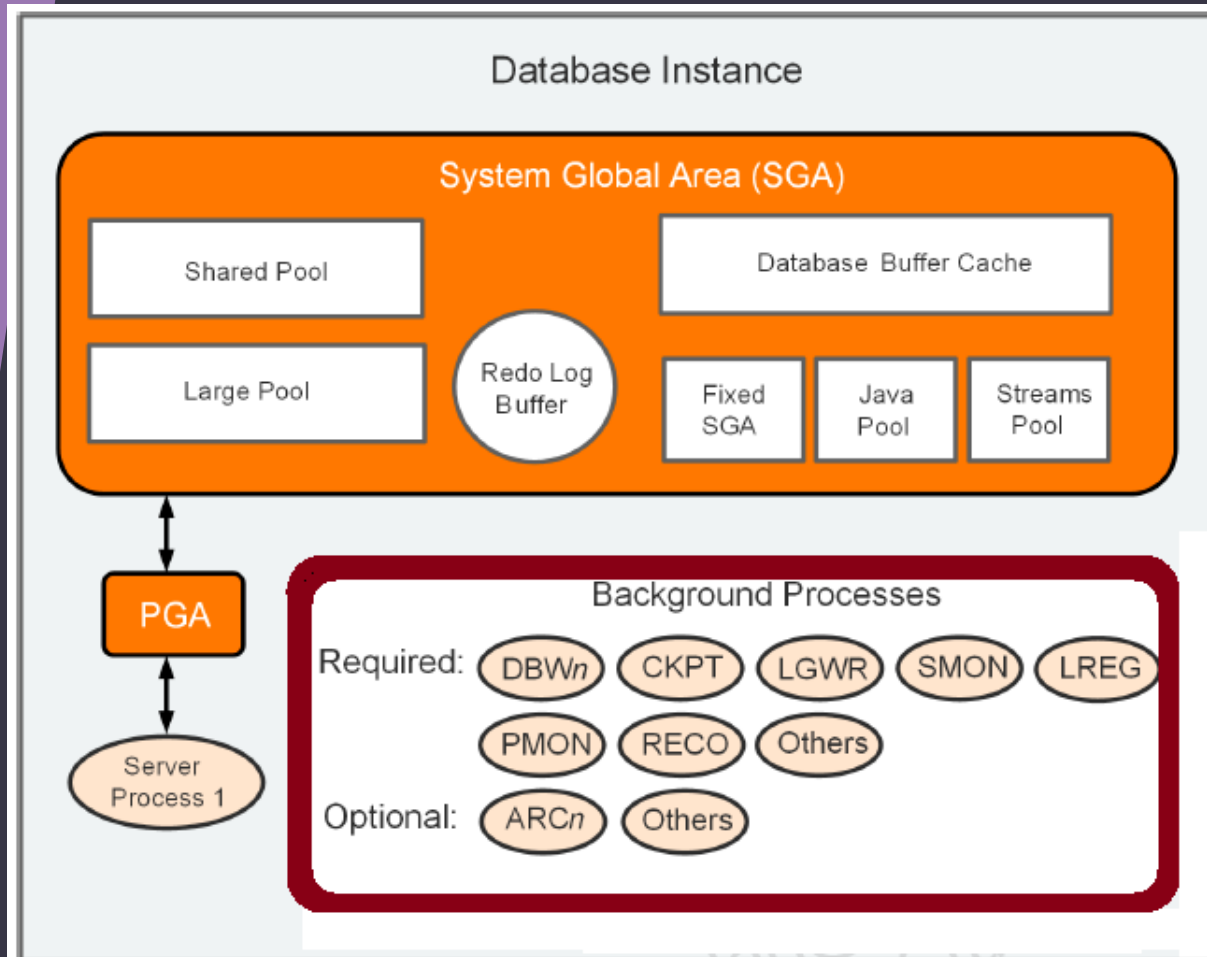# Database Instance
System Global Area (SGA) Part 1

What we will learn in this lecture?

- What is System Global Area (SGA)?
- Main tasks of SGA
- Shared Pool
- Database buffer cache
- Redo Log Buffer

Database Instance

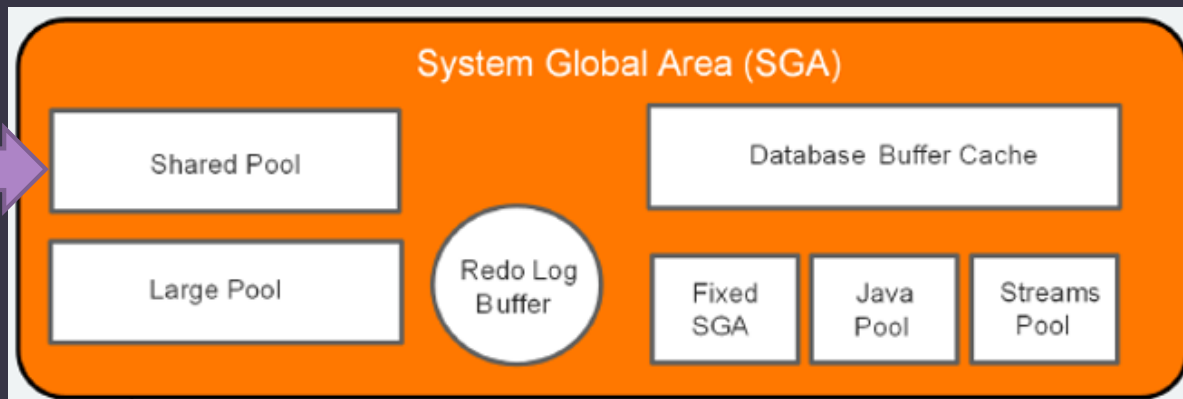A database __instance__ is a set of memory structures and processes that manage database files

What is System Global Area (SGA)

The SGA is a group of shared memory structures that contain data and control information for one database instance.
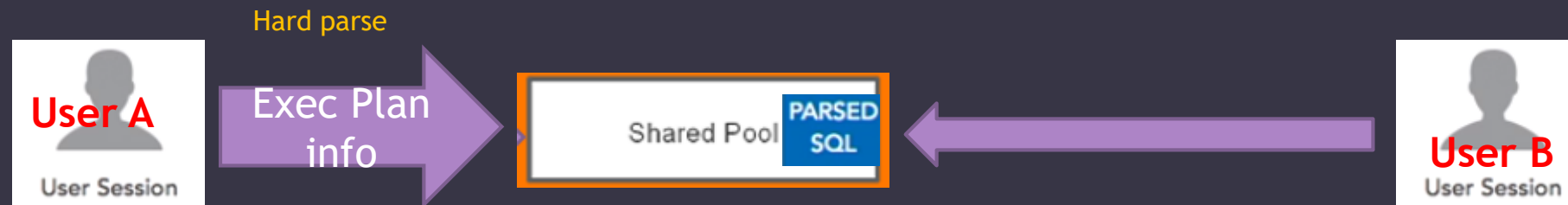
Main tasks of SGA

- ✓ Maintaining internal data structures that many processes access concurrently
- ✓ Caching data blocks read from disk
- ✓ Buffering redo data before writing it to the online redo log files
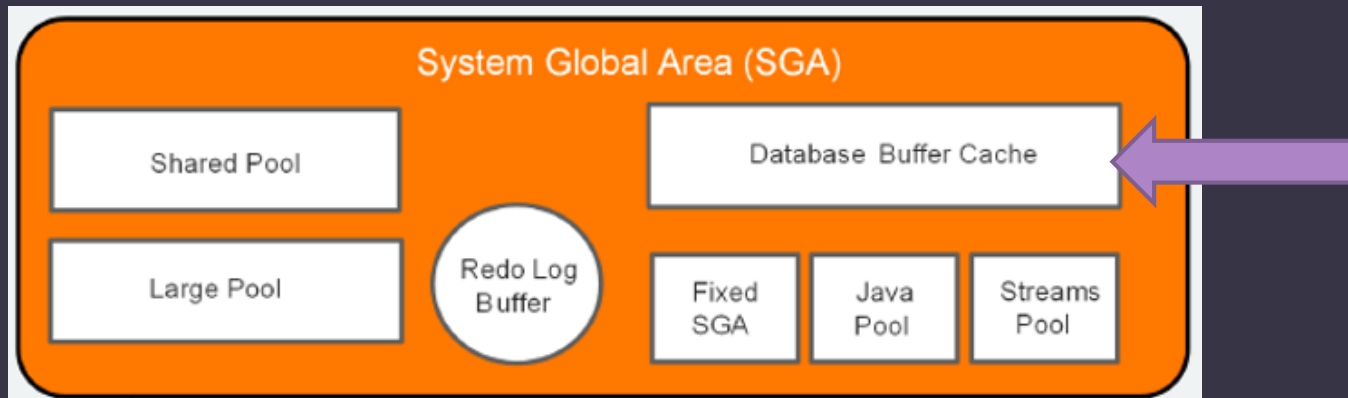- ✓ Storing SQL execution plans

Shared Pool

➢ The most important component of SGA
➢ Cache non user Data like Data dictionary (metadata: data about data ex: DBA_tables)
➢ Shared Pool contains sub components like Data dictionary cache, library cache ,server result cache and many others
➢ Store the cached information about each SQL statement that is executed, like execution plan
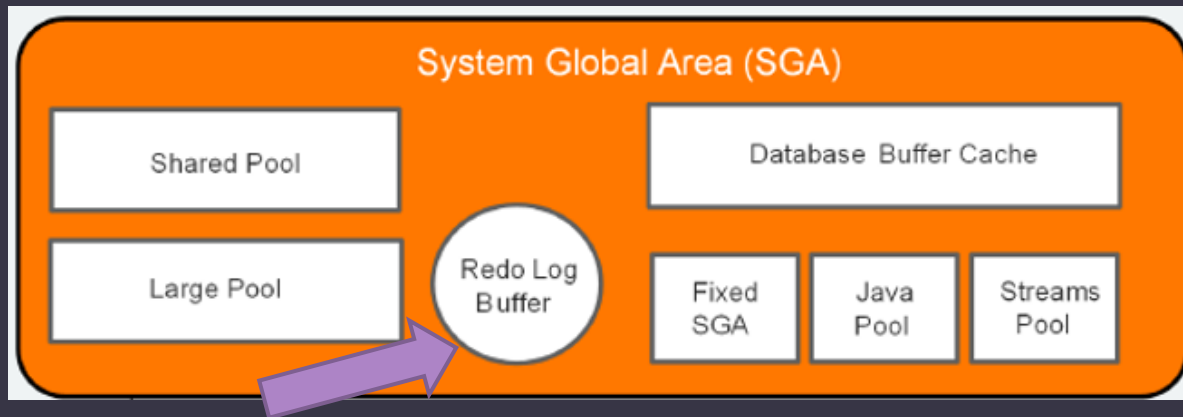
Hard parse

User A
User Session

Exec Plan info

Shared Pool PARSED SQL

User B
User Session

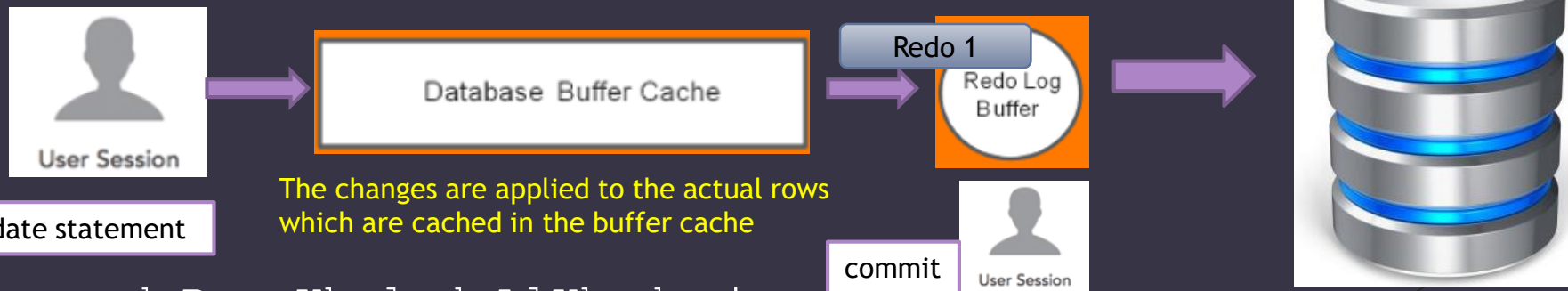Select * from DEPT;

Select * from DEPT;

Database buffer cache

- ➢ responsible for caching database user data.
- ➢ The buffer cache caches frequently accessed database data into memory.

Note: The buffer cache caches blocks of data instead of individual rows (1 block=8 kB by default)

- ➢ All users who are concurrently connected to the database share and access a single database buffer cache
- ➢ The buffer cache including the keep pool, recycle pool, and others

Redo Log Buffer

➢ circular buffer that hold information about changes made to the database
➢ designed to store redo entries (small records that reflect any changes made to the database as part of transactions or database structure changes)
Note: Redo entries are used for database recovery when and if needed.
➢ the Redo Log entries in the RedoLog buffer are also written on a periodic basis to a set of files in our Oracle database storage known as Redo logs files

The changes are applied to the actual rows which are cached in the buffer cache

Thank You

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