Seven Main Components of a Keyframe-based monocular SLAM system:

1. Visual initialization – creates the initial 3D map on startup.
2. Data association – uses previous poses to guess poses for new frames
3. Pose estimation – minimizes error {the difference between the true measurements and their associated matches generated from the map using the guessed pose.
4. Topological/metric map generation
5. BA/PGO/map maintenance – optimizes the map using either Bundle Adjustment or Pose Graph Optimization.
6. Failure recovery – handles situations in which the minimization of error diverges or the data association fails.
7. Loop closure – tries to minimize errors over loops.

Data Association Choices – the data association method can be direct, feature-based, or a mix of the two.

Data Association Types –

* 2D-2D
* 3D-2D
* 3D-3D