Deadlocks can arise if four conditions hold simultaneously:

Mutual exclusion: Only one process at a time can use a resource.

Hold and wait: A process holding at least one resource is waiting to acquire additional resources held by other processes.

No preemption: A resource can be released only voluntarily by the process holding it, after that process has completed its task.

Circular wait: Processes each waiting on the other forming a circle.

Bankers algorithm worse case run time for finding a safe sequence is: (# processes)^2(# resources)

Resource Allocation Graph(RAG): A set of vertices V and edges E