

## **1. Chunk Division**

**To process a large log file in parallel:**

- **Steps:**
  - **Open file in text/binary mode.**
  - **Use seekg and tellg to get file size.**
  - **Divide size equally among threads.**
  - **Assign start/end offsets.**
  - **Align to line boundaries to avoid splitting entries.**
- **Factors for Chunk Size:**
  - **File size**
  - **Number of CPU cores**
  - **Available memory**
  - **Line length variability in file**

## **2. Thread Coordination (Short Form)**

- **Main Thread Responsibilities:**
  - **Create/Manage Threads:** Use `std::thread`, store thread objects, ensure proper joining.
  - **Distribute Work:** Calculate chunk ranges and assign to each thread.
  - **Terminate Cleanly:** Join threads, handle cleanup, and manage exceptions.