**1. Write Request in HDFS:**

**Steps:**

1. **Client contacts NameNode**:  
   The client sends a request to the NameNode to create a new file. The NameNode checks for permissions and whether the file already exists.
2. **NameNode responds with DataNode pipeline**:  
   If valid, the NameNode returns a list of DataNodes to the client where the blocks of the file will be stored (based on replication factor, typically 3).
3. **Client starts writing data**:  
   The client writes data to the first DataNode in the pipeline.
4. **Data is pipelined**:
   * The first DataNode streams data to the second, which streams it to the third.
   * This ensures all replicas are written simultaneously.
5. **Acknowledgement**:  
   Once all replicas have received the block, acknowledgments flow back to the client.
6. **Metadata update**:  
   After all blocks are written, the client informs the NameNode, which updates metadata about the file (like file name, block locations, and replication info).

**2. Read Request in HDFS:**

**Steps:**

1. **Client requests file from NameNode**:  
   The client asks the NameNode for the metadata of a file.
2. **NameNode provides block locations**:  
   The NameNode returns a list of blocks and the corresponding DataNodes that contain each block (based on proximity for efficiency).
3. **Client reads from DataNodes**:  
   The client directly contacts the nearest or least-loaded DataNode and starts reading block by block.
4. **Client assembles the file**:  
   The client reads blocks in order and reconstructs the full file locally.