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Master	Worker 1	Worker 2	Worker 3	Worker 4	Description
	P1, P2	P1, P2	P2	P2, P3	Initial Contents
receive client tasks	↑	↑	↑	↑ →	**Start Map**
send map commands to workers	Map Commands				Master tells worker servers to start the map phase, providing the map function.
	mapResult mapresult for P1 am, 1 person, 1 :	mapResult result = P2 Empty Hi, 1 P2	mapResult result = P2 Hi, 1 Hello, 1 person, 1	mapResult result = P3 do, 1 does, 1. hi, 1.	**Workers Perform Map** Workers execute the map task and store their results in the mapResult file. Then, they inform the master server that the map task has been completed. If a worker server is not used, leave the box blank.
return map state is true. and tells master server the path of map results.	↓ Paths	↓ Paths	↓ Paths	↓ Paths	**Start Shuffle** Master tells worker servers to start the shuffle phase.
send shuffle commands tell master server done by return shuffle command state	↑ execute ← Person, 1 ↓ done shuffleResult am, 1 person, 1 person, 1	↑ execute ↓ done shuffleResult hello, 1	↑ execute ← hi, 1 ↓ done shuffleResult hi, 1 hi, 1	↑ execute ↓ done shuffleResult do, 1 does, 1	**Workers Perform Shuffle** Workers send the map results to each other, based on the hashcode of the key. Workers store these results in another file. Then, they inform the master server when they are done. If a worker server is not used, leave the box blank.
master sends reduce commands to workers	↑ Reduce	↑ Reduce	↑ Reduce	↑ Reduce	**Start Reduce** Master tells worker servers to start the reduce phase, providing the reduce function.
	finalResult am, 1 person, 2	finalResult hello, 1	finalResult hi, 2	finalResult do, 1 does, 1	**Workers Perform Reduce** Workers execute the reduce task, creating a new file with the final results of the map-reduce task. Then, they inform the master server they are done, providing the file location of the result. In this case, the file location is always the same for simplicity.
return path of the final result file. Master know they are done by checking the Reduce state.	↓ done	↓ done	↓ done	↓ done	

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