**Q1: What is the relation between a number of mappers, combiners and partitioners in a MapReduce system, if any?**

Partitioner is responsible for dividing the intermediate key space and assigning intermediate key/value pair to reducers. It also defines the tasks about which intermediate key/value pairs should be copied.

Each mapper has its own local combiners. Combiners are optimization in map reduce which saves bandwidth by minimizing the number of intermediate key/value pairs and allow for local aggregation before sorting and shuffling.

**Q2: What is the relation between the input and output of a mapper and partitioner?**

Mapper produces the intermediate key/value pair from the input list and partitioner takes the intermediate key space and then assign the key/vale pairs to the reducers. In short, output of mapper acts as the input for partitioner.