Performance Evaluation

The test is placed in the package src/test/java in TestPerformance class. The program first of all creates an ECSServer. The key-value servers are created and connected to main ECS Server. After the step of creating servers (1, 5 or 10 servers), HashRing is created and the addresses of the servers are given to the HashRing in order to add them to the ring. In the estimatedTimeTest method we tested the program behaviour with different number of clients, different number of servers and different caching strategies. Size of the cache is constant (100). Then different numbers of clients are activated (1, 5 or 10 clients). Estimated time is calculated by:

```
long startTime = System.currentTimeMillis();

// ... do something ...

long estimatedTime = System.currentTimeMillis() - startTime;
```

for get, put and delete requests.

Clients	Servers	CacheSize	Strategy	getRequest	PutRequest	DeleteRequest
1	1	100	LRU	7 ms	19 ms	7 ms
5	1	100	LRU	6 ms	8 ms	8 ms
10	1	100	LRU	7 ms	8 ms	7 ms
1	5	100	LRU	9 ms	46 ms	5 ms
5	5	100	LRU	7 ms	24 ms	5 ms
10	5	100	LRU	12 ms	40 ms	13 ms
1	10	100	LRU	3 ms	9 ms	3 ms
5	10	100	LRU	3 ms	25 ms	4 ms
10	10	100	LRU	9 ms	67 ms	7 ms
1	1	100	FIFO	7 ms	16 ms	10 ms
5	1	100	FIFO	5 ms	10 ms	8 ms
10	1	100	FIFO	7 ms	9 ms	7 ms
1	5	100	FIFO	7 ms	37 ms	7 ms
5	5	100	FIFO	14 ms	37 ms	8 ms
10	5	100	FIFO	6 ms	23 ms	7 ms
1	10	100	FIFO	6 ms	82 ms	10 ms
5	10	100	FIFO	3 ms	17 ms	4 ms
10	10	100	FIFO	4 ms	8 ms	4 ms

1	1	100	LFU	7 ms	18 ms	9 ms
5	1	100	LFU	6 ms	7 ms	8 ms
10	1	100	LFU	8 ms	8 ms	9 ms
1	5	100	LFU	11 ms	28 ms	10 ms
5	5	100	LFU	9 ms	46 ms	7 ms
10	5	100	LFU	4 ms	15 ms	5 ms
1	10	100	LFU	7 ms	11 ms	8 ms
5	10	100	LFU	4 ms	42 ms	4 ms
10	10	100	LFU	6 ms	17 ms	4 ms

From the tests, we understand that if the current server is not responsible for the range of the given key, put requests take longer time than it normally take. Because of the replicas, get requests take less than put requests. The reason for that is that there are 3 servers which can respond to the read requests.