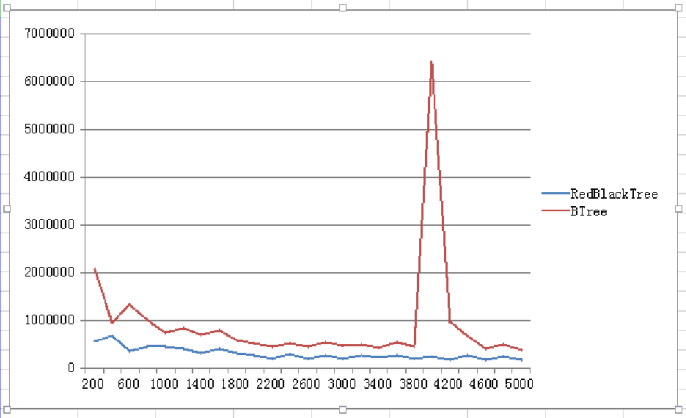
Analysis work

Following pictures are my test for running time.

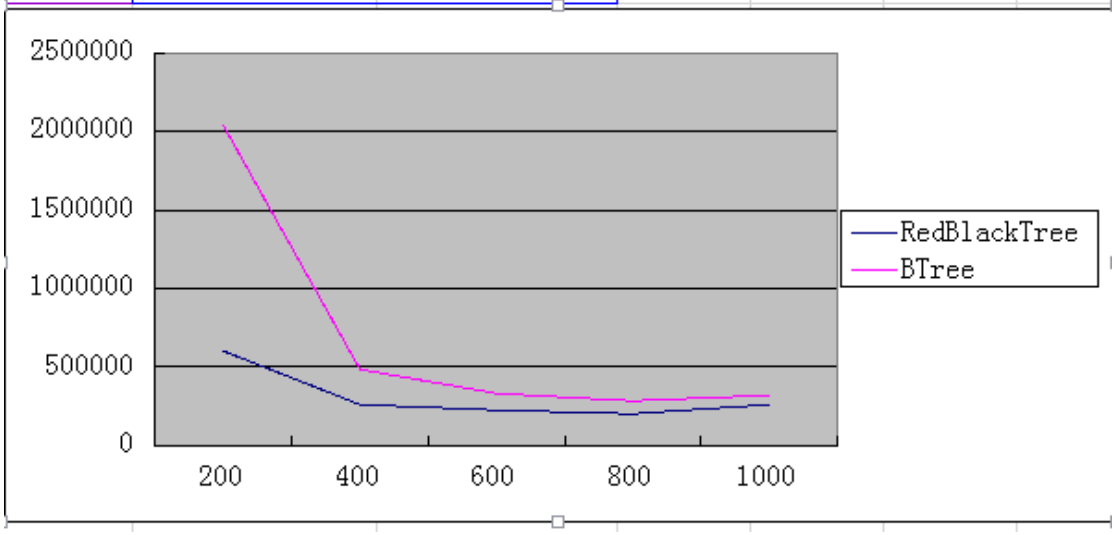
Initial

	RedBlackTree	BTree
200	575553	2073551
400	678184	958161
600	367418	1332147
800	447060	997571
1000	444596	751257
1200	403544	834593
1400	313639	694194
1600	415449	799289
1800	305429	591154
2000	272997	530806
2200	194177	445417
2400	286135	531627
2600	196641	450344
2800	277103	532448
3000	205672	465944
3200	281208	491806
3400	215935	436796
3600	279977	551333
3800	203209	452397
4000	245493	6427559
4200	178988	970887
4400	271356	678594
4600	189251	399850
4800	254524	507406
5000	173241	377270



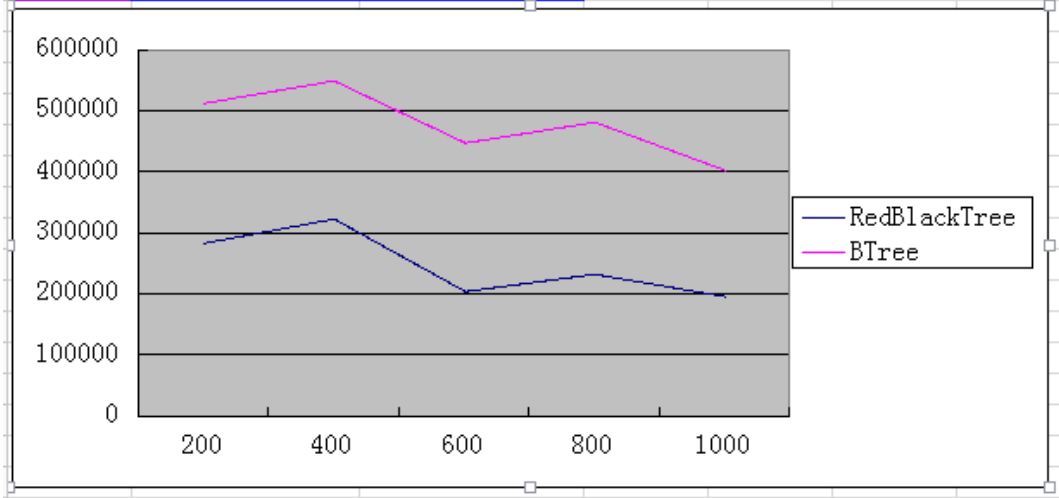
Insert

	RedBlackTree	BTree
200	601417	2039478
400	257398	473333
600	222503	329239
800	199925	275871
1000	257809	311587



Delete

	RedBlackTree	BTree
200	281443	511326
400	320535	548475
600	201540	446599
800	230483	480908
1000	195726	401646



Analysis

1). At first, we can find that Red-Black-Tree runs faster than B-Tree. Because every node in B-Tree is too large, we costs too much time on copying arrays and search the location of key value in one node. We need at most 2t times for copying and 2t times for searching in one node. However, our operations on Red-Black-Tree, they just need change the pointer. Every change costs a constant time. We need at most lgN times changes for every fix up. For every insert, Red-Black-Tree costs at most 2lgN, B-Tree costs at most 2t*(log2t(N)). The running time is decided to t and N. In this program, Red-Black-Tree runs

faster. And in fact, if we really use B-Tree, there must need disk read or write. So, it will be slower.

2). Besides, we find that the two kinds of tree runs low at start and runs faster and stable at end when initial and insert. Because, we insert a lot of data, the tree is balance and the height of the tree will not change too much. So, we just need search and insert directly. There is nearly no cost for fix up. So, it will be fast and stable.

3). As for delete, at start, the tree is stable. So, we don’t need too much cost for fix up. The running time is decided on N. In the end, N reduce too much. So, the running time reduce. And there are still some peak. They are just the big fix up.