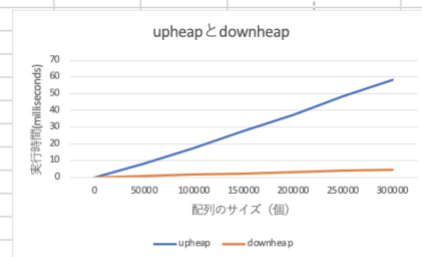


Q1

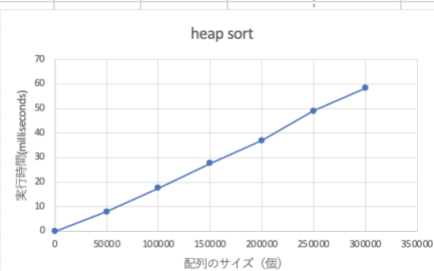
upheap						
Data size	Elapsed time(millisecons)					
Average	1	2	3	4	5	
0	0	0	0	0	0	0
50000	8.3382	7.995	8.726	8.36	8.699	7.911
100000	17.7184	17.718	17.758	18.088	17.499	17.529
150000	27.6282	27.291	26.838	28.627	27.604	27.781
200000	37.2326	37.157	37.022	37.058	37.549	37.377
250000	48.6088	50.114	47.672	48.67	47.983	48.605
300000	58.379	58.309	58.567	58.424	58.629	57.966

Data size	upheap	downheap
0	0	0
50000	8.3382	0.7762
100000	17.7184	1.5344
150000	27.6282	2.2548
200000	37.2326	2.9822
250000	48.6088	3.9362
300000	58.379	4.6144

downheap						
Data size	Elapsed time(millisecons)					
Average	1	2	3	4	5	
0	0	0	0	0	0	0
50000	0.7762	0.828	0.806	0.713	0.786	0.748
100000	1.5344	1.539	1.586	1.472	1.537	1.538
150000	2.2548	2.211	2.241	2.201	2.172	2.449
200000	2.9822	2.992	2.947	2.953	3.049	2.97
250000	3.9362	3.721	3.656	4.401	3.969	3.934
300000	4.6144	4.519	4.42	4.407	4.54	5.186



heapsort						
Data size	Elapsed time(millisecons)					
Average	1	2	3	4	5	
0	0	0	0	0	0	0
50000	7.957	7.668	8.204	8.006	7.85	8.057
100000	17.6014	17.767	17.586	17.644	17.674	17.336
150000	27.8088	28.001	28.595	27.514	27.589	27.345
200000	37.1054	37.141	37.218	37.129	36.982	37.057
250000	49.0424	47.391	49.774	49.239	47.182	51.626
300000	58.379	58.233	58.226	58.883	59.331	57.222



Q2

1. 8

2. 7

3. upheap

4. v

5. 4

6. <=

7. 2

8. 5

9. 1

10. 2

11. 7

12. 2

13. 1

14. downheap

15. 2

16. 3

17. 4

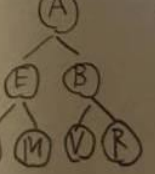
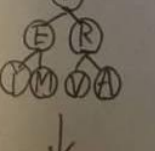
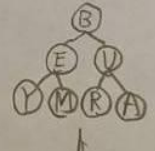
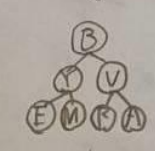
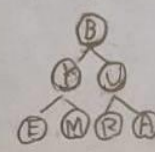
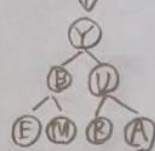
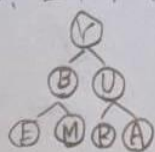
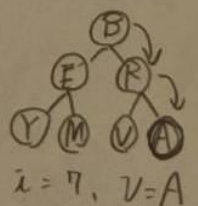
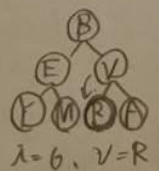
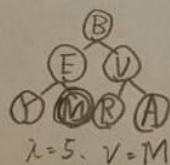
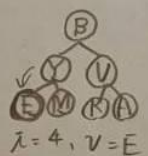
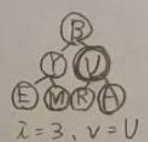
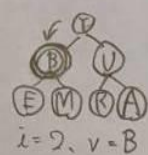
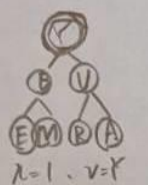
18. 5

19. 5

20. 5

Q3.  $A[B] = \{ '0', 'Y', 'B', 'U', 'E', 'M', 'R', 'A' \}$

初期狀態



終狀態

