

Algorithm	Number of integers					
	1,000	2,000	4,000	8,000	16,000	32,000
Arrays.sort()	0	1	3	2	1	10
Bubble sort	10	37	88	209	721	2613
Selection sort	7	21	57	120	494	925
Insertion sort	8	15	46	91	263	231
Mergesort	2	3	10	7	14	11
Quicksort	1	4	8	15	5	7

1,000,000  
81

254  
126

Algorithm	Number of integers					
	1,000	2,000	4,000	8,000	16,000	32,000
Arrays.sort()	0	0	1	1	0	2
Bubble sort	0	0	1	0	0	0
Selection sort	2	9	236	324	388	972
Insertion sort	0	0	0	1	1	0
Mergesort	1	1	1	2	8	9
Quicksort	3	10	25			

1,000,000  
17

149

Algorithm	Number of integers					
	1,000	2,000	4,000	8,000	16,000	32,000
Arrays.sort()	0	0	0	0	1	2
Bubble sort	4	26	95	384	782	2167
Selection sort	12	13	224	162	245	739
Insertion sort	3	17	66	286	415	631
Mergesort	0	0	0	9	6	9
Quicksort	4	18	28			

1,000,000  
5

87

Algorithm	Number of integers					
	1,000	2,000	4,000	8,000	16,000	32,000
Arrays.sort()	0	1	0	0	2	5
Bubble sort	5	24	96	168	505	2042
Selection sort	12	16	14	90	242	820
Insertion sort	0	2	8	70	9	38
Mergesort	1	0	1	1	5	9
Quicksort	0	0	0			

1,000,000  
43

154







[illegible]

```
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
bubble sort a      2613.0    20180401_232717   ajord17  32Kints.txt
bubble sort b         0.0    20180401_232717   ajord17  32Kints.txt
bubble sort c     2167.0    20180401_232719   ajord17  32Kints.txt
bubble sort d     2042.0    20180401_232721   ajord17  32Kints.txt
selection sort a       925.0    20180401_232722   ajord17  32Kints.txt
selection sort b       972.0    20180401_232723   ajord17  32Kints.txt
selection sort c       739.0    20180401_232724   ajord17  32Kints.txt
selection sort d       820.0    20180401_232725   ajord17  32Kints.txt
insertion sort a       231.0    20180401_232725   ajord17  32Kints.txt
```

insertion sort b	0.0	20180401_232725	ajord17	32Kints.txt
insertion sort c	631.0	20180401_232726	ajord17	32Kints.txt
insertion sort d	38.0	20180401_232726	ajord17	32Kints.txt
mergesort a	11.0	20180401_232726	ajord17	32Kints.txt
mergesort b	10.0	20180401_232726	ajord17	32Kints.txt
mergesort c	9.0	20180401_232726	ajord17	32Kints.txt
mergesort d	9.0	20180401_232726	ajord17	32Kints.txt
quicksort a	7.0	20180401_232727	ajord17	32Kints.txt

```
Exception in thread "main" java.lang.StackOverflowError
```

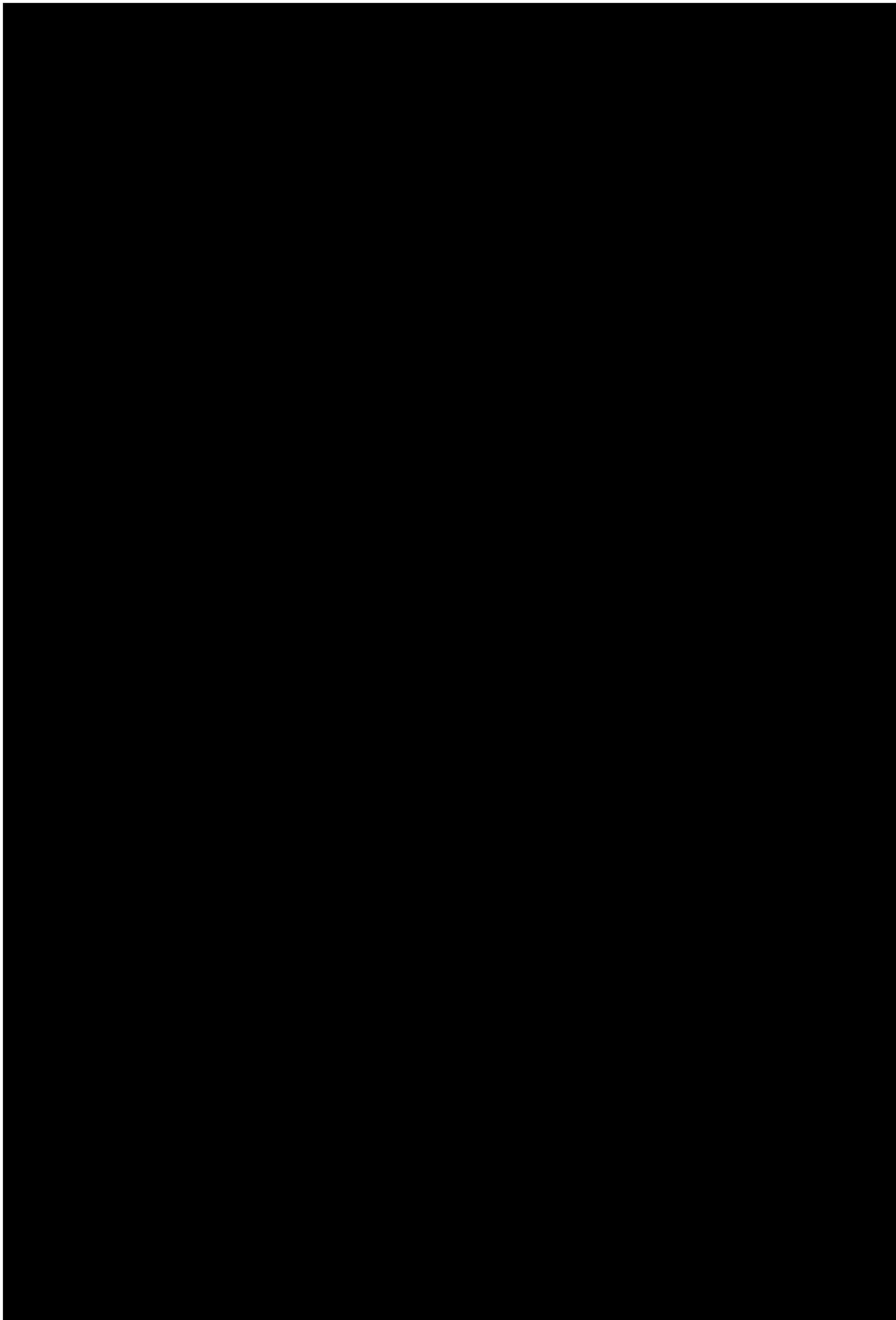
[illegible]

```
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
at Sorting.recursive_qs(Sorting.java:74)
bubble sort a      721.0    20180401_232708    ajord17    16Kints.txt
bubble sort b       0.0    20180401_232708    ajord17    16Kints.txt
bubble sort c     782.0    20180401_232709    ajord17    16Kints.txt
bubble sort d     505.0    20180401_232710    ajord17    16Kints.txt
selection sort a   494.0    20180401_232710    ajord17    16Kints.txt
```

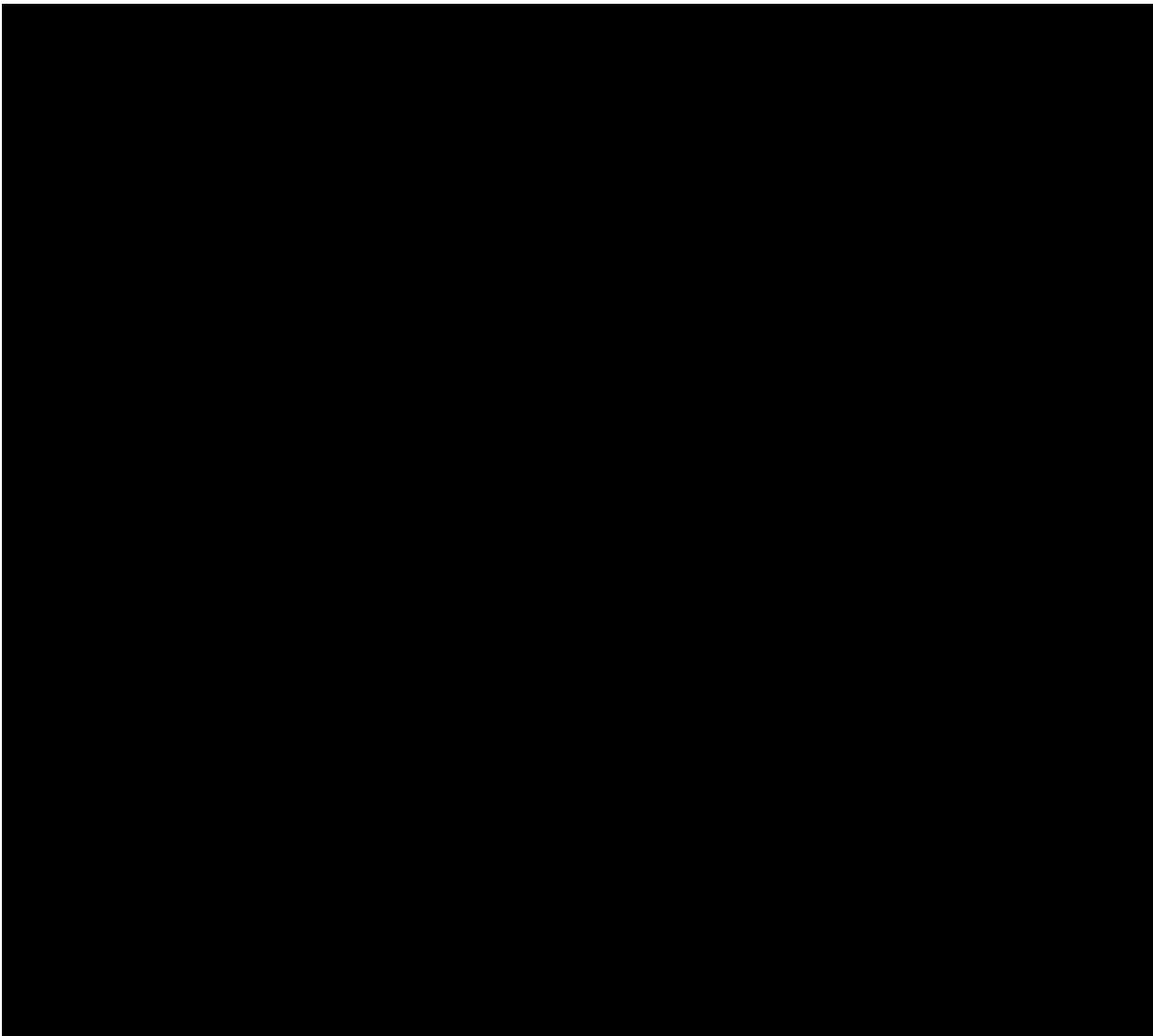
```

selection sort a      171.0  20180401_232712  ajord17  16Kints.txt
selection sort b      388.0  20180401_232711  ajord17  16Kints.txt
selection sort c      245.0  20180401_232711  ajord17  16Kints.txt
selection sort d      242.0  20180401_232711  ajord17  16Kints.txt
insertion sort a      263.0  20180401_232712  ajord17  16Kints.txt
insertion sort b        1.0  20180401_232712  ajord17  16Kints.txt
insertion sort c      415.0  20180401_232712  ajord17  16Kints.txt
insertion sort d        9.0  20180401_232712  ajord17  16Kints.txt
mergesort a          14.0  20180401_232713  ajord17  16Kints.txt
mergesort b           8.0  20180401_232713  ajord17  16Kints.txt
mergesort c           6.0  20180401_232713  ajord17  16Kints.txt
mergesort d           5.0  20180401_232713  ajord17  16Kints.txt
quicksort a           5.0  20180401_232713  ajord17  16Kints.txt
Exception in thread "main" java.lang.StackOverflowError

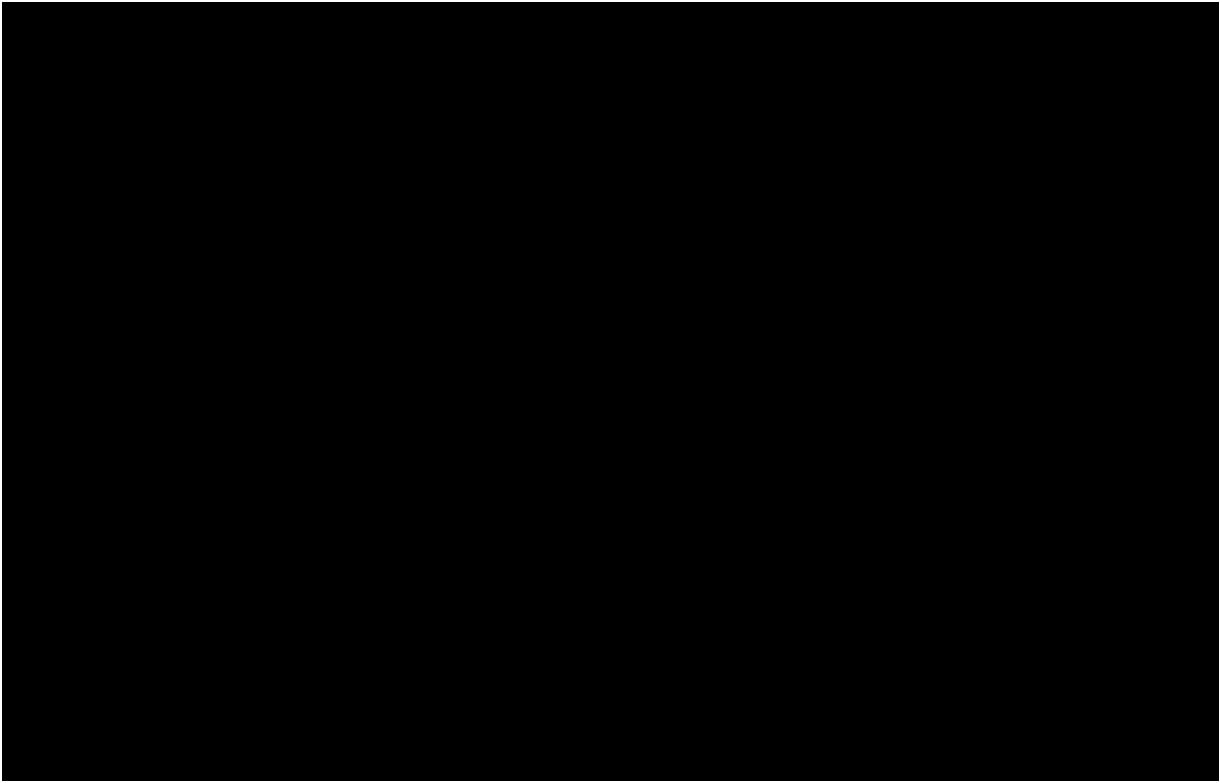
```

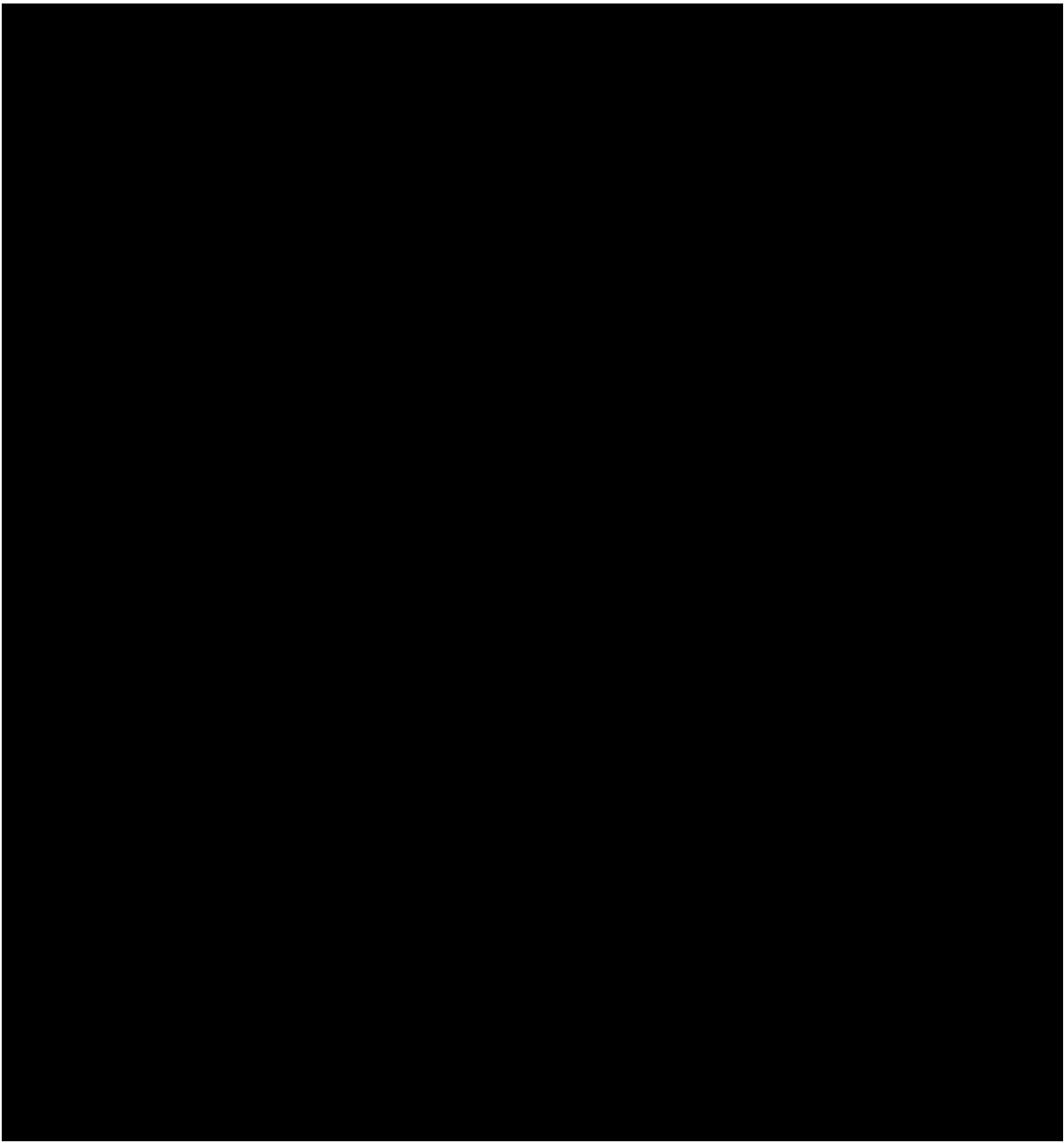


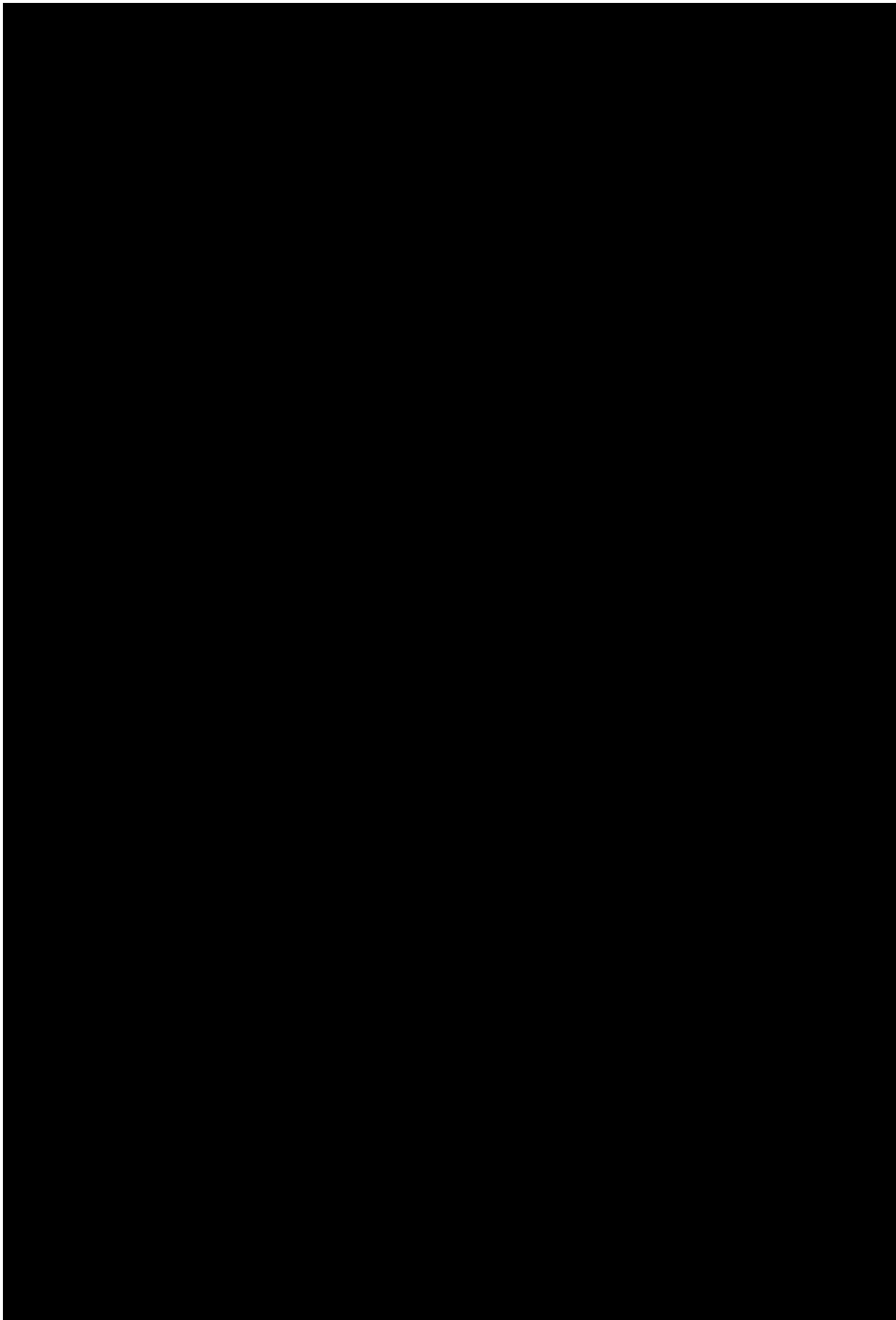
```
j in $(seq 5); do java Sorting $i $j; done; done
```

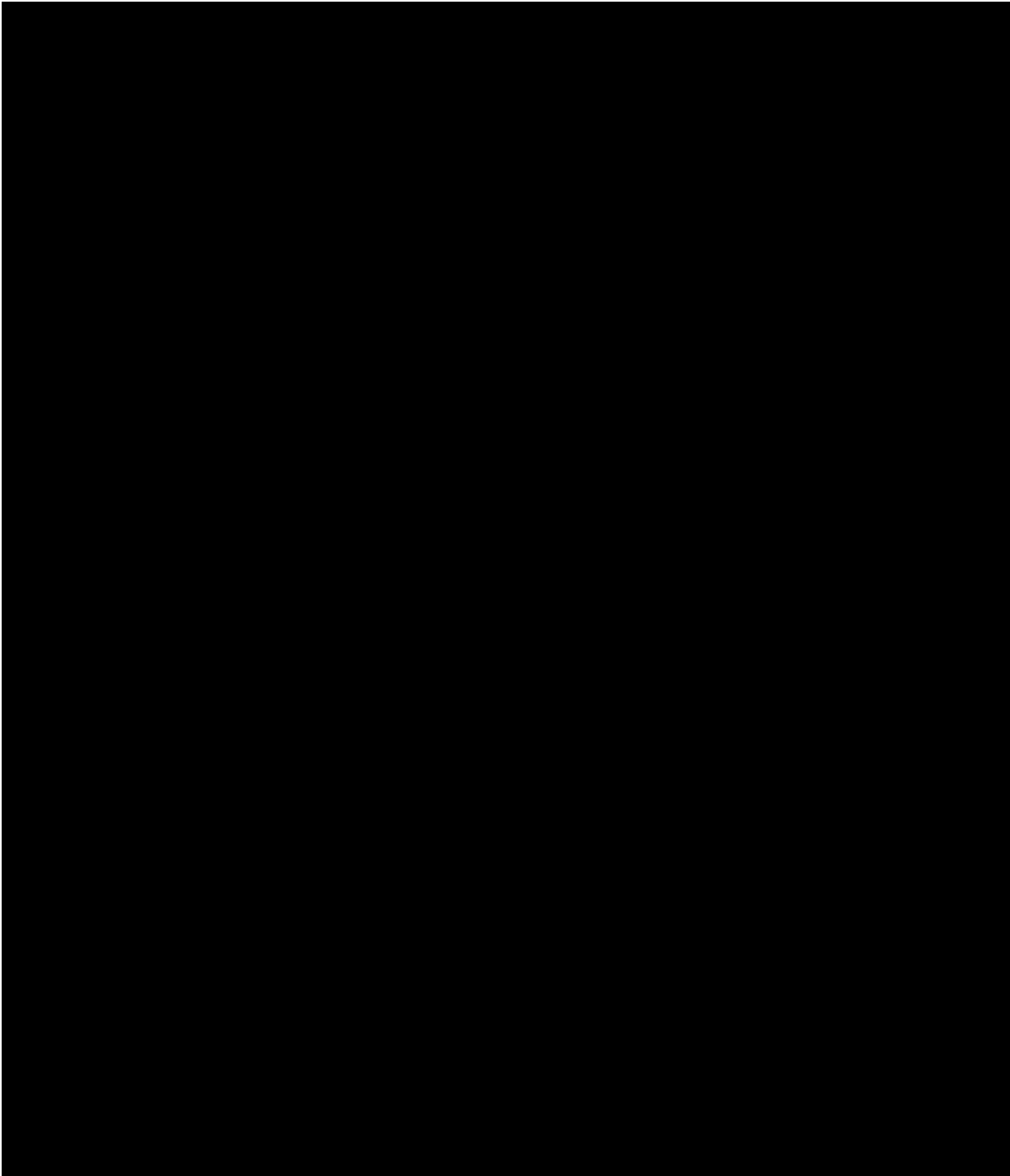


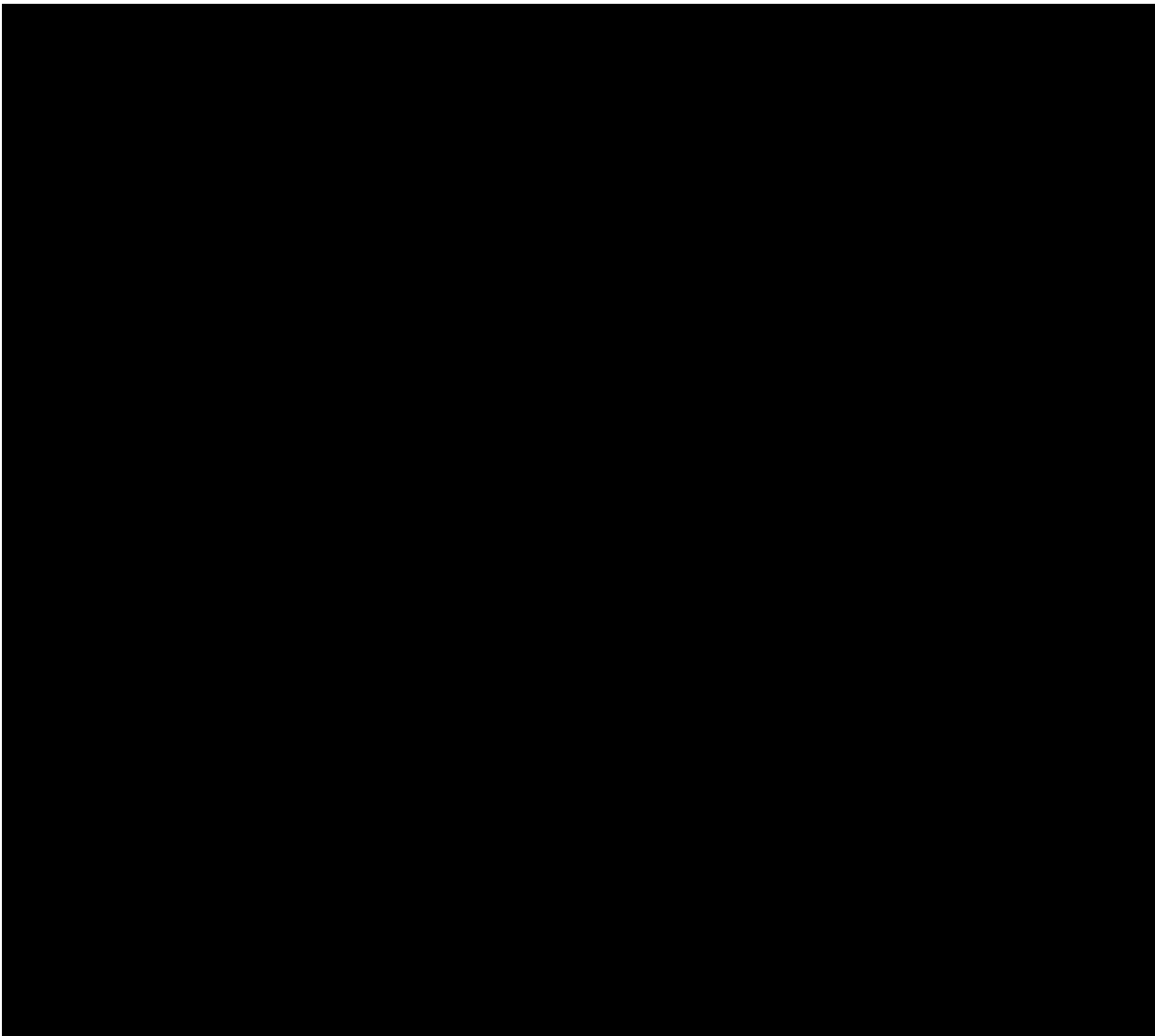


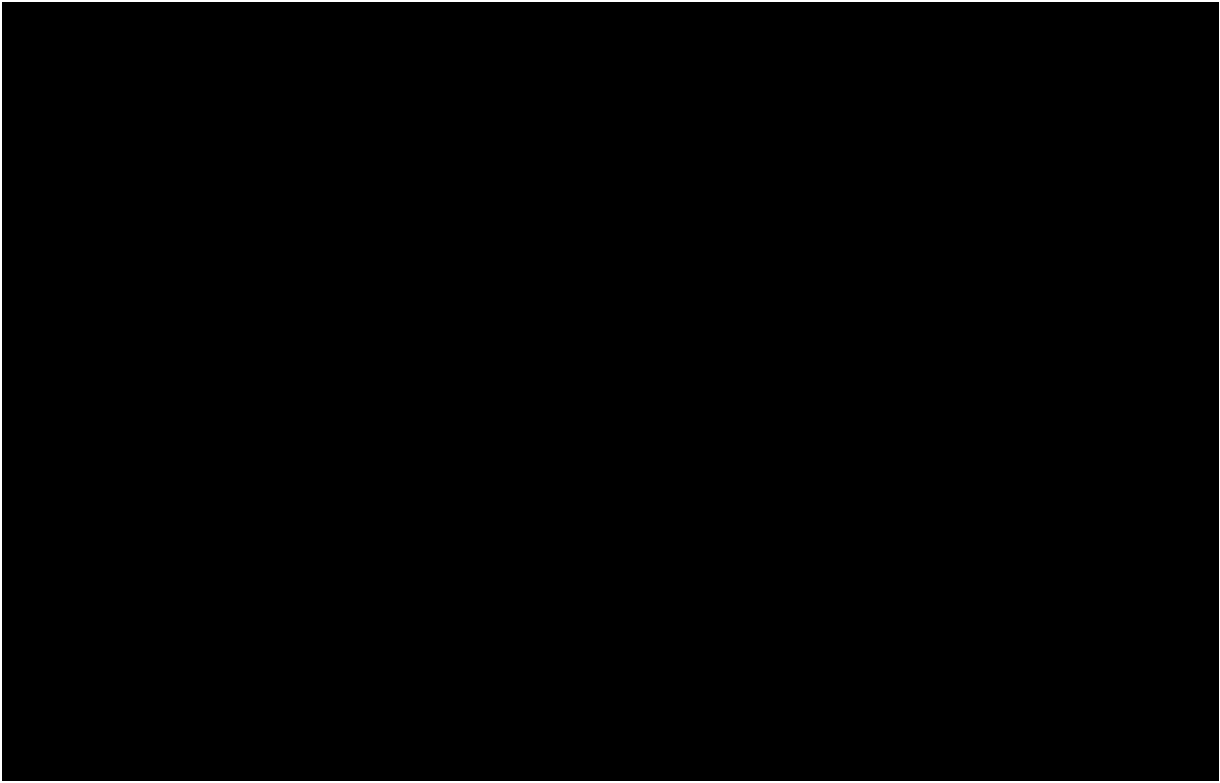


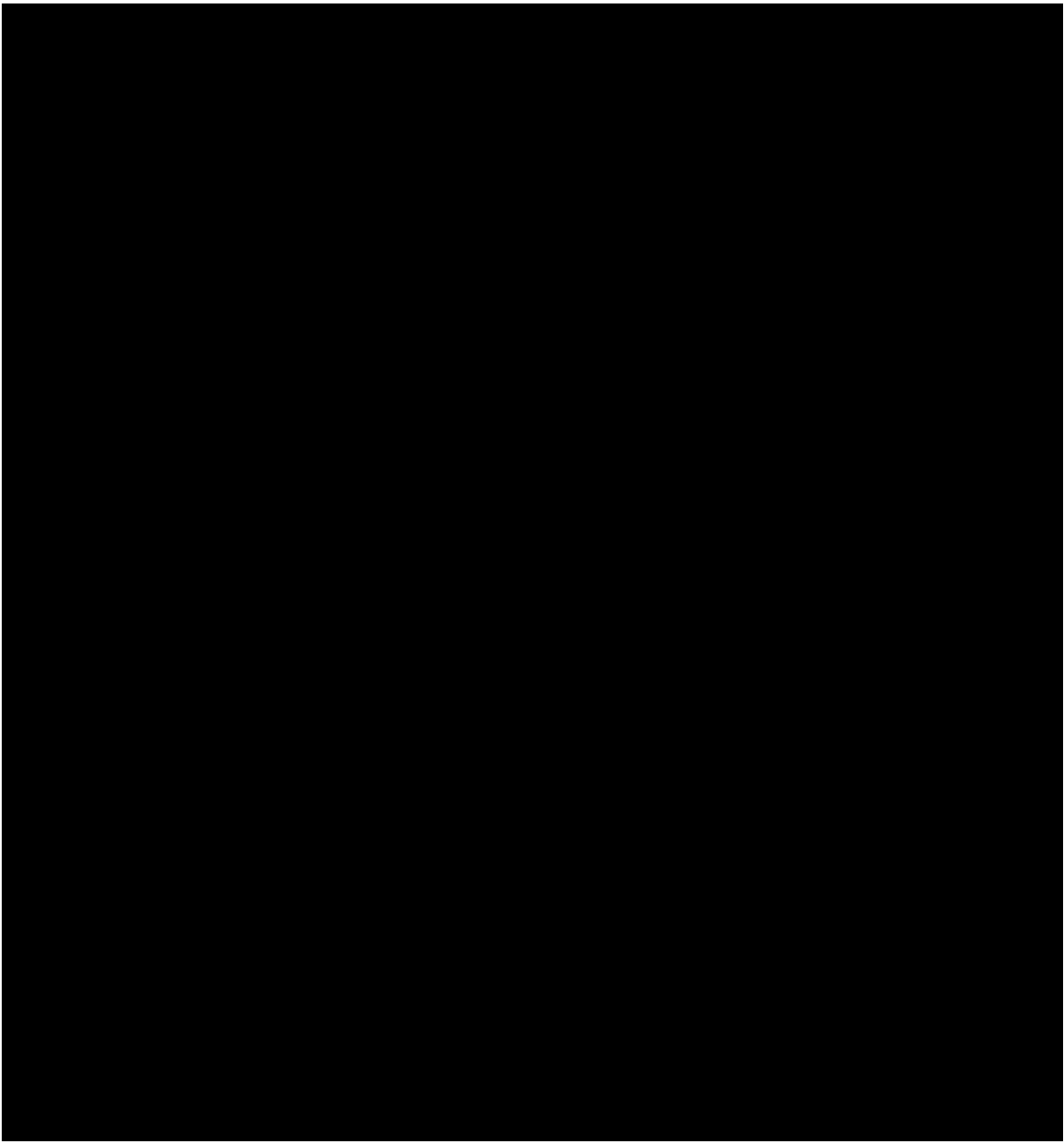








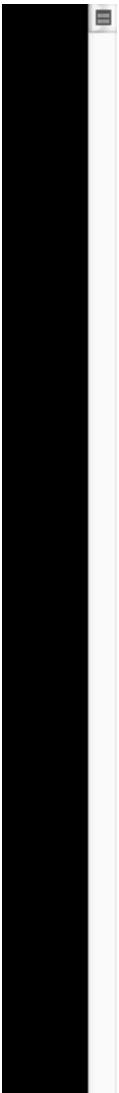


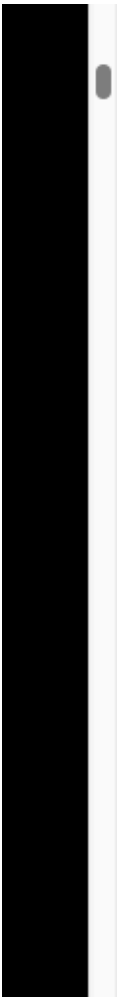
















```
Exception in thread "main" java.lang.StackOverflowError
```

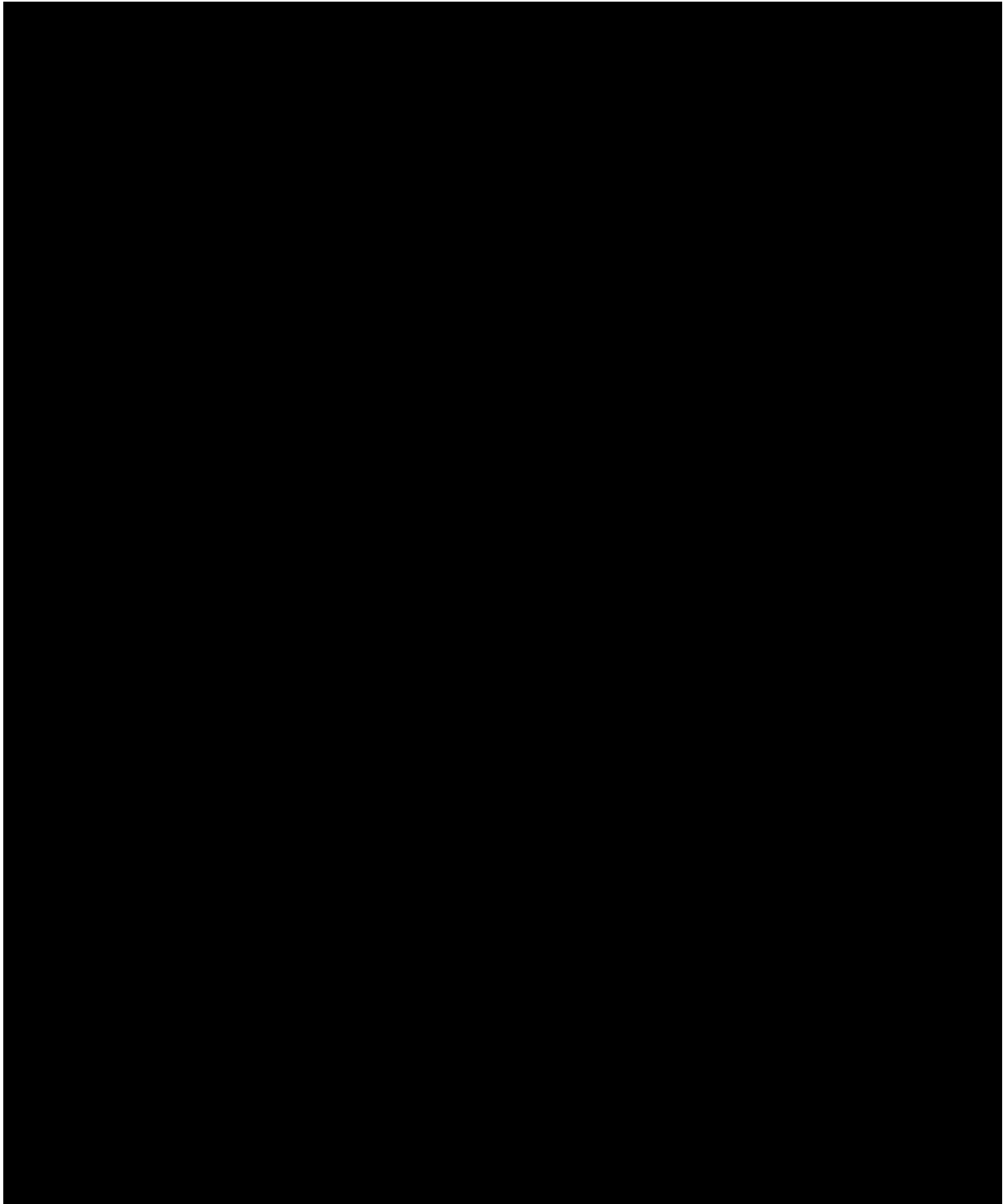
[illegible]











```

mergesort a      1.0  20180401_232703  ajord17  4Kints.txt
quicksort a      8.0  20180401_232703  ajord17  4Kints.txt
quicksort b     25.0  20180401_232703  ajord17  4Kints.txt
quicksort c     28.0  20180401_232703  ajord17  4Kints.txt
quicksort d      0.0  20180401_232703  ajord17  4Kints.txt
bubble sort a   209.0  20180401_232704  ajord17  8Kints.txt
bubble sort b     0.0  20180401_232704  ajord17  8Kints.txt
bubble sort c   384.0  20180401_232704  ajord17  8Kints.txt
bubble sort d   168.0  20180401_232704  ajord17  8Kints.txt
selection sort a  120.0  20180401_232705  ajord17  8Kints.txt
selection sort b  324.0  20180401_232705  ajord17  8Kints.txt
selection sort c  162.0  20180401_232705  ajord17  8Kints.txt
selection sort d   90.0  20180401_232705  ajord17  8Kints.txt
insertion sort a   91.0  20180401_232706  ajord17  8Kints.txt
insertion sort b    1.0  20180401_232706  ajord17  8Kints.txt
insertion sort c  286.0  20180401_232706  ajord17  8Kints.txt
insertion sort d   70.0  20180401_232706  ajord17  8Kints.txt
mergesort a      7.0  20180401_232707  ajord17  8Kints.txt
mergesort b      2.0  20180401_232707  ajord17  8Kints.txt

```







