Q1: When we run our program, we estimate the following values for a and b

Assumed Model: $T(N) = a*N^b$

	a	b
Insertion Sort	$1.8 * 10^{-9}$	1.94
Selection Sort	$1.24 * 10^{-8}$	1.85

Hypothesis for shell sort:

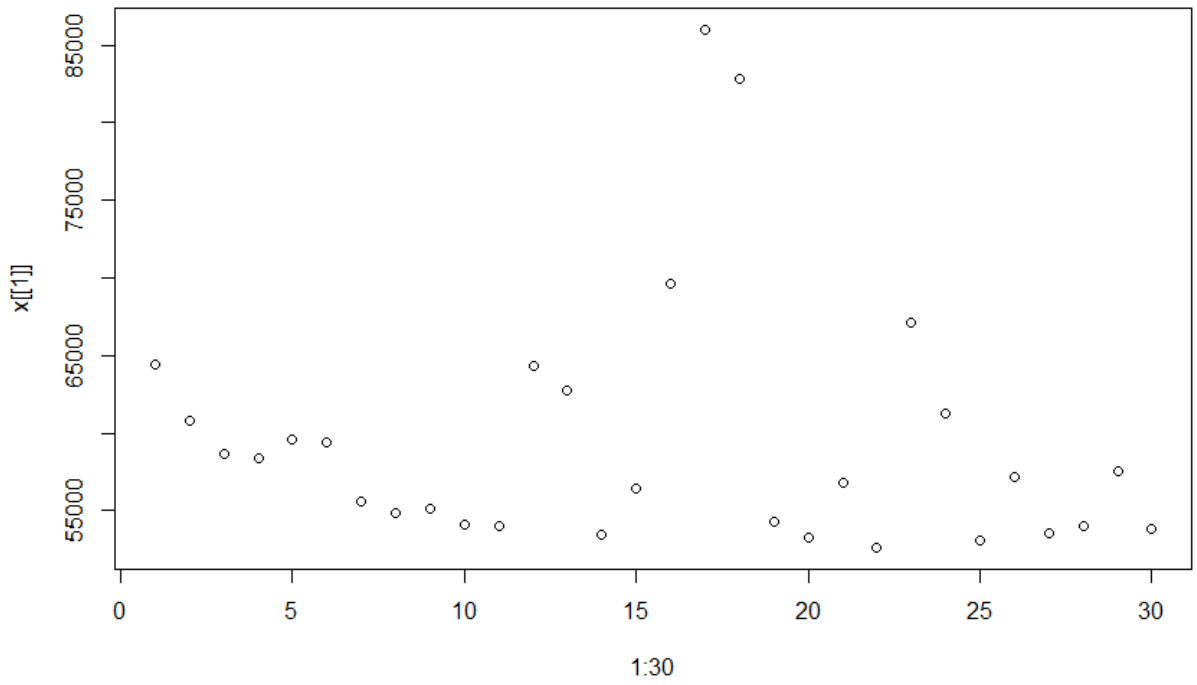
"Average complexity of shell sort is between nlog(n) {best case} and $n^{3/2}$ {worst case}"

We from our data that the model for shell sort can be approximated as:
$T(N) = 2.38 * 10^{-5} * N^{1.1}$

We get an approximate value of b as 1.1
So, it is between the best complexity of nlog(n) and $n^{3/2}$

So, our experimental data confirms our hypothesis.

10^3



Y axis : runtimes for given m

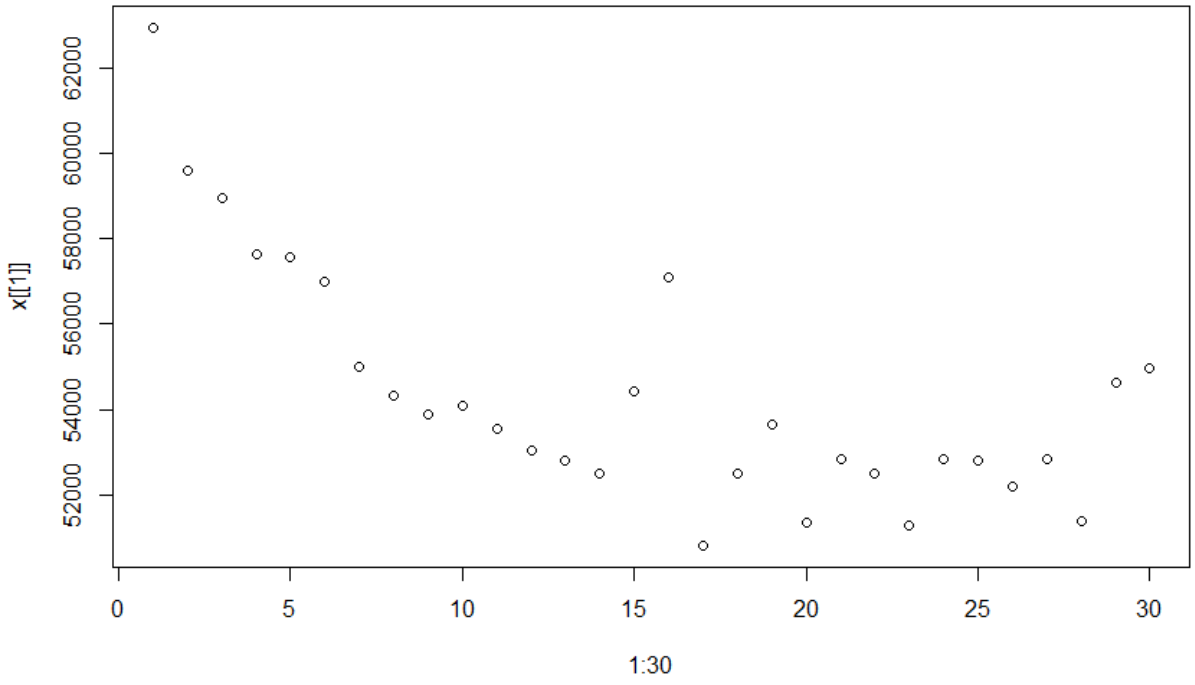
X axis : m

In this case, M = 22 is most efficient

10^4

Y axis : runtimes for given m

X axis : m

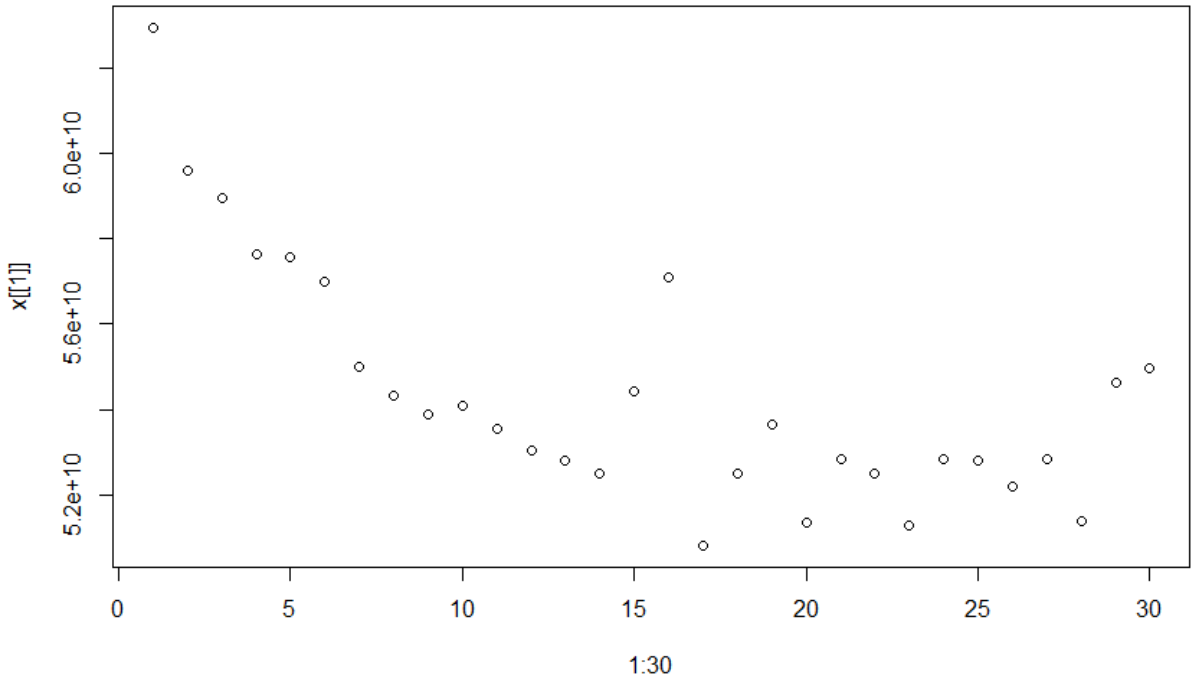


In this case, M = 16 is most efficient

10^5

Y axis : runtimes for given m

X axis : m

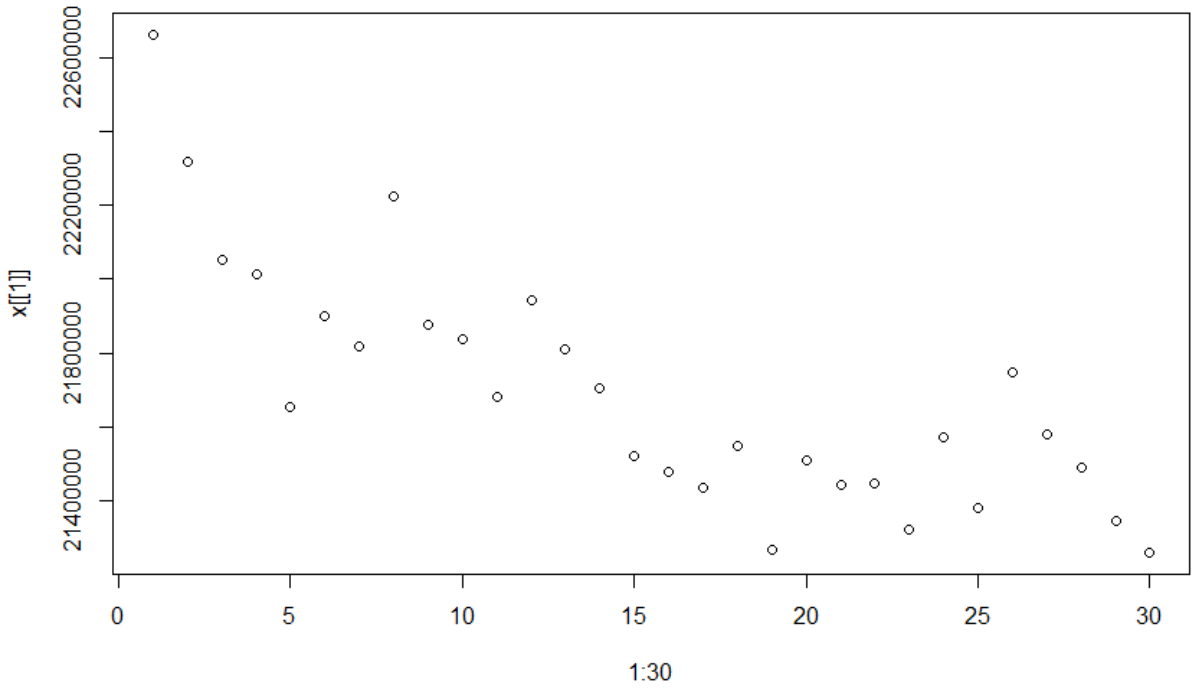


In this case, M = 17 is most efficient

10^6

Y axis : runtimes for given m

X axis : m



In this case, M = 18 is most efficient