Exercise 1

f / g	$\log_2(n)$	s(n)	5	2^n	1 / n	n	e^n
$\log_2(n)$	$f = \Theta(g)$	f = o(g)	f = o(g)	f = o(g)	-	f = o(g)	f = o(g)
s(n)		$f = \Theta(g)$	f = w(g)	f = o(g)	-	$f = \Theta(g)$	f = o(g)
5			$f = \Theta(g)$	f = o(g)	-	f = o(g)	f = o(g)
2^n				$f = \Theta(g)$	-	f = w(g)	f = O(g)
1 / n					$f = \Theta(g)$	-	-
n						$f = \Theta(g)$	f = o(g)
e^n							$f = \Theta(g)$

Legend:
f = O(g): we say that f grows asymptotically no faster than g
f = $\Omega(g)$: we say that f grows asymptotically at least as fast as g
f = $\Theta(g)$: we say that f grows asymptotically as fast as g
f = w(g): we say that f grows asymptotically faster than g
f = o(g): we say that f grows asymptotically slower than g

Exercise 2

a)

Sorts a list by finding the smallest element in the unsorted elements and swapping it to the left. After each swap the current index gets increased by one so that the next smallest element can be found and switched.

b)

In one loop: n -1

Overall: (n-1) * (n – 1)

f = $\Theta(n^2)$

c)

Minimum: List already sorted, no duplicates: 0 x swapping

1 2 3 4 5 6 7 8 9

Maximum: n – 1 x swapping

9 7 8 4 5 6 → 4 7 8 9 5 6 → 4 5 8 9 7 6 → 4 5 6 9 7 8 → 4 5 6 8 7 9 → 4 5 6 7 8 9