Assignment 6

1. For each function f(n) and time, determine the largest size n of problems that can be solved in time t. (Assuming that the algorithm to solve the problem takes f(n) microseconds.) [3pts]

   (1) f(n) = $\sqrt{n}$, time = 1 second.
   n = 10^{12}

   (2) f(n) = n^2, time = 1 hour.
   n = $6*10^4$

   (3) f(n) = n!, time = 1 century.
   n=17

2. True and false. [6pts]

   (1) Only the computation which has a correct algorithm is meaningful.
   True

   (2) All engineering approaches cannot ensure 100% correctness, but can ensure some degree of correctness. True

   (3) The time complexity of Insertion-Sort is O(n). (n is the size of array)False

3. What kinds of primary control structures does the following algorithm consist of? [1pt]

   Answer:Loop

```
INSERTION-SORT(A)
1  for j = 2 to A.length
2      key = A[j]
3      // Insert A[j] into the sorted sequence A[1 .. j − 1].
4      i = j − 1
5      while i > 0 and A[i] > key
6          A[i + 1] = A[i]
7          i = i − 1
8      A[i + 1] = key
```