

1. (a) since keys are very short.

It is good to use selection sort or Insertion sort.

(b) since we want to sort fast and use less memory

Heap Sort is the best choice

(c) Since it is slightly out of order.

insertion sort is the best choice.

(d) since we only care about average running time

Heap Sort or Merge Sort are good.

2.

(a) the vector should be in ascending order.
Then when we heapify the vector, we will have to swap every element.

(b) the vector should be in ^{ascending} order.

Then every time when we extract the max, the min swap to the root and we have to reshape the heap again.