In the general case heap sort is faster than bubble sort, however there are conditions under which bubble sort might be faster:

- If the array is already sorted bubble sort terminates after one scan (in $O(n)$ time), while the heap sort still requires $O(n \log n)$.

- Depending on the implementation, creating the heap might have an overhead, so for small inputs bubble sort might be faster.

Some general comments about the implementation question:

- Unless required otherwise, the times that are reported should be the average of several runs. This creates smoother graphs, without humps and other weird phenomena which require your explaining.

- Do not report zero running times. If the algorithm terminates too fast on small inputs, then for a sufficiently large $N$ measure $N$ runs of the algorithm together. You can divide the total time by $N$, to obtain the average time of one run.

- Don’t forget to analyze the graphs. In particular, if your results stray from what you expected, try to explain why it happened.