**Notes:**

* Implement the algorithm and analyze the results using the give input files
* **Deliverables**: Report.pdf file and your code file (please do not send a zip file. If you have more than one class in your code, then submit each file separately through Canvas.)
* Homework report must follow the guidelines provided in the sample report uploaded in Canvas

**Objectives:**

* Implement heap sort using a max-heap
* Compare the performance of insertion sort, merge sort, and heap sort

**Problems**

1. Implement a method to sort a given array using the heap sort algorithm. Use the algorithm from the textbook (see page 2).
2. Write a driver program to test the heap sort algorithm for the arrays of varying lengths provided in Canvas. Use input\_100.txt file to test your code initially.
3. Compare the execution time of heap sort with insertion sort implemented in Lab-2 and merge sort implemented in Lab-3. Make sure you use the same array to compare the performance. Use a table or plot to summarize the results and document your observations and analysis in the report. Use the following input files only: input\_100.txt, input\_1000.txt, input\_5000.txt, input\_10000.txt, and input\_50000.txt

