Today’s topics: Binary heaps. Textbook §§ 21.1–21.4
Next class: Heapsort, external sorting, papers. §§ 21.*.

1. List the members of your group below. Underline your name.

2. Using conventional graphical notation, depict the complete binary tree encoded by the following array, based on the textbook’s method.¹

```
i:  1  2  3  4  5  6  7  8  9 10 11 12 13 14
a[i]: 50 40 60 70 65 75 62 63 41 42 51 52 53 54
```

3. Mark all violations of the (min-)heap order property in the tree of Question 2 by annotating the corresponding edge with a V.

4. Depict the state of the following binary min-heap after all actions triggered by a `deleteMin` operation have completed. Repeat for three additional `deleteMin` operations.
5. Starting with the final heap of Question 4, depict the state of the heap after all actions triggered by a \textit{insert(57)} operation have completed. Repeat for operations \textit{insert(33)}, \textit{insert(67)}, and \textit{insert(40)}. 
6. *Heapify* the tree of Question 2 using the *buildHeap* operation from the textbook.\(^2\) Depict intermediate states of the tree, including at least the states after *buildHeap* completes each level of the tree.

\(^2\) *Idem*, §21.3.