

Implementing a Sorted List

In a cellular modem stack, it is required to hold lists of cells the modem has found during a scan. Typically, such a cell has information like RSRP, RSRQ, SINR and a Cell ID.

Often, it is of advantage if such lists are sorted by one of the properties of a cell, e.g. to have the cell with the strongest connection parameters at the beginning of the list.

Your task is to design a component that implements such a sorted list. **It shall** fulfill the following criteria:

- The component shall be implemented in C or C++.
- It shall allow **adding** new cells to the list.
- It shall be possible to get the **length** of the list.
- There shall be a functionality to **get** a cell at a specific **index** of the list.
- It shall be possible to select **varying criteria** for **sorting**.

Optionally, include the following criteria in your implementation:

- Ideally, the list should be **reusable** also for other types of objects than cells.
- It would be beneficial if the sorting has **minimal run time impact**, even at the expense of additional instruction code.

For your implementation, also consider the following hints:

- You may assume any C/C++ compiler standard you like, including the availability of the complete C++ Standard Template Library (STL).
- Your code does not have to compile necessarily. This task is more about the overall structure of the component to be developed. However, this does not mean you should use pseudo code everywhere.
- You are free to choose to design a C style function library or a C++ class, pick whatever suits you best.
- And finally: Don't get lost in details. Do not implement a broader interface than what is required in the criteria mentioned above.