

This exercise is based on the Derrick Coetzee's implementation of linear-time selection as a literate program.¹

1. List the members of your group below. Underline your name.
2. Provide a simple linear-time algorithm for finding the 3rd and 7th smallest elements (together) of an array.
3. What tools were likely used to produce this program? Hint: See page headers.
4. Briefly explain the notation used on page 2 of the program. What does the 7 in $\langle \text{median5 } 7 \rangle$ denote? What does the notation (2) as used on the right of page 3 denote?

¹Derrick Coetzee, An efficient implementation of Blum, Floyd, Pratt, Rivest, and Tarjan's worst-case linear selection algorithm, <http://moonflare.com/>, 2004.

5. Provide a replacement for $\langle selectRandom \rangle$ in a naive Java translation of the program, highlighting the differences.

6. Provide an alternate implementation of $\langle selectRandom \rangle$ in Java or C++ that is significantly different from those in the program and Question 5. Highlight the differences and their significance.

7. Critique the implementation of *select base case*.