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 ⟨median5 7⟩ denote? What does the notation (2) as used on the right of page 3 denote?

5. Provide a replacement for \( \langle \text{selectRandom} \rangle \) in a naive Java translation of the program, highlighting the differences.

6. Provide an alternate implementation of \( \langle \text{selectRandom} \rangle \) 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).