

Lab 6 – Vectors; Reading from Files and Access Values

6.1 Time Table

Specify function $\mathbf{v} = \text{read_vector}(\text{filename})$ that reads a vector from a file with filename. The format of the file is one element (a number) at each line.

Test your function with the files contained in the auxiliary zip file available from the web page (with URL <http://mc.ssdidi.fct.unl.pt/resources/files.zip>).

6.2 Sequential Search in a Vector

- a) Specify function $\mathbf{p} = \text{find_seq}(\mathbf{x}, \mathbf{V})$ that aims at finding the index \mathbf{p} where value \mathbf{x} (a number) occurs in vector \mathbf{V} . If \mathbf{x} does not occur in \mathbf{V} , the function returns $\mathbf{p} = \mathbf{0}$. Nothing is assumed about vector \mathbf{V} , so all its values must be considered sequentially, from the first position until the last position.
- b) Count the number of accesses to elements of \mathbf{V} that are made during execution of the function. Test your function with existing and non-existing values in the vectors obtained from the files obtained from the web page.

6.3 Bipartite Search in a Vector

- a) Specify function $\mathbf{p} = \text{find_bip}(\mathbf{x}, \mathbf{S})$ that aims at finding the index \mathbf{p} where value \mathbf{x} (a number) occurs in the sorted vector \mathbf{S} . If \mathbf{x} does not occur in \mathbf{V} , the function returns $\mathbf{p} = \mathbf{0}$. Note that \mathbf{S} is sorted, in increasing order, so the search should take this information into consideration, and follow a bipartite strategy.
- b) Count the number of accesses to elements of \mathbf{S} that are made during execution of the function. Test your function with existing and non-existing values in the vectors obtained from the files obtained from the web page.