Digital Communication - Summative Assessment

Description

This assignment involves creating a program (written in Python or Java) to compute Huffman encoding and decoding. You must submit your code, along with a short report, electronically via DUO. The deadline is **Friday February 13, 14:00**.

The program should operate as follows.

- The Huffman encoder should take one input file: a text file (extension .txt, such as myfile.txt). It should output the compressed text as another file; you may choose any extension you want for the compressed file, e.g. myfile.hc.
- The Huffman decoder should take one input file: a compressed file, e.g. myfile.hc. It should output the corresponding original text file myfile.txt.

The report must be a pdf file, should not exceed five pages, and should include the following:

1. Exact instructions how to execute the code on a Durham networked machine.
2. A clear description of your programs and of any design choices you have made.
3. Analysis of running time of the encoder, running time of the decoder, and compression ratio.
4. Limitations of your design and implementation and possible features that could be included.

Marking scheme

The total number of marks is 100, with the following breakdown.

- Huffman encoder: **25** marks.
  - Completeness and correctness of the implementation: 15 marks.
  - Efficiency of the implementation: 10 marks.
- Huffman decoder: **25** marks.
  - Completeness and correctness of the implementation: 15 marks.
  - Efficiency of the implementation: 10 marks.
- Report: **50** marks.
  - Instructions how to execute the code: 10 marks.
  - Clear description of programs and design choices: 20 marks.
  - Analysis of results: 10 marks.
  - Limitations and possible features: 10 marks.