Assignment 8 – Huffman Coding

Collin Wen

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Purpose

The purpose of this assignment is to create a program that compresses a data file. To do this we use huffman coding which finds the symbols in the file with the most frequency and gives them a different representation that uses fewer bits. We are creating two programs, one that compresses a file by converting an inputted file into huffman code, and a data decompressor that does the opposite.

How to Use the Program

If the user wants to compress a file they will run the huff program. To do this they will type "./huff" followed by the two required arguments "-i" for the input file and "-o" for the name of the output file the user would like the compressed file to be made into. There is also a "-h" option that prints out a help message for the program. To decompress a file they would run the dehuff program by typing "./dehuff" into the command line with the same arguments.

Ex to run the huff program with the inputted file "infile" and naming the wanted output file "outfile":

```
./huff -i infile -o outfile
```

Ex to run the huff program with the inputted file "infile" and naming the wanted output file "outfile":

```
/dehuff -i infile -o outfile
```

Program Design

For this assignment there are 6 c files used and a Makefile used to compile unit tests and create the 2 executables from huff.c and duff.c with the object files.

huff.c and duff.c are both the main c files containing the main program.

bitwriter.c/bitwriter.h contains a struct and functions that are used to write out a binary file bit by bit.

bitreader.c/bitreader.h contains a struct and functions that are used to read a binary file bit by bit.

node.c/node.h contains a struct and functions that create and free a node that contain fields the huffman coding will use. This file is also used to print a binary tree of nodes.

pq.c/pq.h contains two structs and functions to create the Priority Queue abstract data type.

Results

I have not yet completed my program.