

ARM Final Report Group 22

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1 Structure and Implementation of Our Assembler

The main function in `assemble.c` is used to run our assembler. It reads in source code from an AArch64 source file, whose filename is given as the first command line argument, and outputs AArch64 binary code to a file, whose filename is given as the second command line argument. We achieve this through a two-pass assembly process.

1.1 First Pass

The first pass generates a symbol table associating each label of the source file with its correct address. We used a global linked list to represent our symbol tables. The contents of the source file are read to a buffer from which each line is parsed. If a line match the label regex/format, it is written to the symbol table alongside an address obtained by multiplying the line number by instruction size.

1.2 Second Pass

The second pass reads each instruction/directive of the source file and generates the corresponding binary encodings. Our program moves linearly through each line of the buffer. When a line representing an instruction is reached, it is tokenized to produce an opcode and an array of upto 4 operands. This process used calls to `strtok_r`. The opcode of the instruction then is hashed, and the hash value used to obtain the relevant function pointer. This function is called with the obtained operands as arguments. We implemented the conversion of data transfer instructions by... We implemented the conversion of data processing instructions by... We implemented the conversion of branch instructions by... We implemented the conversion of special instructions by... We implemented the conversion of directives by...

1.3 File Organisation

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2 Design

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3 Testing Strategy

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4 Design Details

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5 Group Reflections

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6 Individual Reflections

6.1 Ruben Vorster

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6.2 Arron Stothart

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6.3 Pip Moss

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6.4 Faris Chaudhry

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