

computer Architechture

Lab-3 (RISC-V Disassembler)

REPORT:

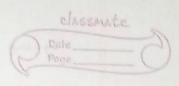
Program is divided into multiple parts for readability and functionality.

- A In main() function
 1) we call a fn to ready the file pointer.
 - 2) Then we go through tile once to get the Instruction count (Ic)
 - 3) We initialize a 2d array of strings Instructions [IC][33] to store binary instructions.
 - 4) We convert hex intruction to binary before storing in array.
 - 5) An int array labels[Ic] is used to store labels.
 - (Instead of Lo we store oin labels a rray por that instruction which has that label. For no label we have value -1)
 - 6) After that we pass IC, labels arrays, instructions to disassembler()

 for to disassemble.

A In disassembler () function-1) It runs the disassemble () fin for each intruction to Seperately disassemble them one by one In disassemble () function -1) From the given instruction it first checks the opcode 2) and calls the appropriate function for respective format type to disassemble the instruction (ex, R-formate), I-fomate), etc) In R-format(), I format(), S-format(), B_format(), J_format(), U_format() functions -1) This functions if inds instructions respective rd, rs1, rs2 register numbers, imm value, etc. (acc. to format) 2) After that its functs, tunct 7 values are checked to know the instruction name, 3) Then the instruction is Stored in instruction [Ic][33] with instruction name as well as register names, mon value, labels etc. according to instruction type (This instructions are street or Over whitten in instructions [IC][33] array tiely bla 33. characters are enough to store any instruction)

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4) we also takel the instructions accordingly with appropriate value in takels array.

back in main() fn
7) After all this, we call the print ()
function to print all the instructions
with appropriate labels.
(with label data from labels array,
labelling is done here)

8) Other functions like hex To Binary (), binary To Decimal string (), etc are created and used for convenience

For Testing
An input tile with all the asked instructions in the problem statement is used. The hex code for them was obtained from ripes.