Report

Velma Dhatri Reddy
AI21BTECH11030

Coding Approach:

I have implemented the RISC-V disassembler code in C++. For this I have used few functions for conversions hexadecimalToBinary, binaryToDecimal, twoscomplementToDecimal and binaryToHexa which I have used for conversion.

It has a function called decoder which takes the input in format of a vector with its elements as strings and returns equivalent assembly instructions. It reads the machine code converts into binary which is used to find the format using opcode. After finding the format, func3, funct7 have been used find the operator and others to get further information to get the instruction.

In steps we can write it as:

1. The machine code is stored in a vector with its elements as strings .
2. The code is then converted to binary and opcode is calculated to find the format.
3. If there is only one operation corresponding to the given opcode we don't need the funct3 or funct3 else we can find the operation using them.
4. Register values and immediate values are calculated by conversion using the above conversions functions.

Testing:

To check my code I have used the example given in the Lab3 assignment and have used few question from hw2 assignment to check my answers. I have also checked with simple test cases by giving few instructions and converted them to machine code using RISC-V simulator which I have given to my code as input.