Bit String to Decimal Number

Due: May 23, 2025

Problem Description

You are given an ASCII file whose size is smaller than 1024 bytes. The file contains some binary strings separated by spaces. Each binary string contains exactly 32 bits which encode a 32-bit 2's complement integer number. There can be more than one line in the file and a line may not have any bit strings. What you need to do is writing a RISC-V program to read the file, convert each 32-bit string into the corresponding integer number in decimal format, and display the decimal number on the monitor. You should use RISC-V instruction set simulator **Jupiter** (with I, F, M extensions) to develop and execute the assembly code. The input file name is *example.txt.*

Output Format

The first line should contain only a prompting message "** The file descriptor number: " followed by a number. The second line should contain only a prompting message "The number of bytes read: " followed by a number. The second line counting backward should contain only a prompting message "The total number of bit strings is: " followed by a number. The last line should contain only a prompting message "** Program is terminated normally." Each line between the second line and the second line counting backward should contain a bit string and the corresponding integer number in decimal format.

What Should Be Handed in:

- A file contains the assembly code*, which should have a header same as the one in Homework 1*. The file name should be **sID.s** where ID is your student ID number. A valid file name must look like s1091111.s .
- A clip like the one shown in the example output below. Save the clip as a file called **sID.png**, where ID is your student ID number. A valid file name for an output clip must look like s1091111.png .
- The homework will not be graded if you do not follow the above rules.

Example Output

Given the bit strings in the file provided along with the problem sheet, your program's output except the file descriptor number should be exactly the same as the example output shown below.

Console

```
** The file descriptor number: 3
The number of bytes read: 385
00000000000000000000000000000000 0
11111111111111111111111111111111 -1
10101010101010101010101010101010 -1431655766
11111111111111111111111111111111 -1
00000000000000000000000000000000 0
11111111111111111111111111111111 -1
00000000000000000000000000000001 1
10000000000000000000000000000000 -2147483648
00000000000000000000000000000001 1
00000100000000000000000000000000 67108864
10000000000000000001000000000000 -2147479552
The number of bit strings is: 11
** Program terminated normally.
```