Homework 3

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Your task is to read an integer from the standard input, apply certain operations on it, and print the result.

First of all you must specify if the input is a prime number. After that, there will be two circumstances to deal with:

1. **Number is prime:** You must count the occurrences of '01's in the number and print the result.
2. **Number is not prime:** You must count the occurrences of '101's in the number and print the result.

You **must** do this exercise using by implementing three functions. All functions receive a single integer as their input parameter. The function are

- **is_prime:** returns 1 if the input argument is prime.
- **count_01:** returns the number of "01" patterns in the input parameter.
- **count_101:** returns the number of "101" patterns in the input parameter.
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Attention 2: In this exercise you must have 4 files (besides driver.c, asm_io.c etc.). Here are the files and the function implemented in each of them.

1. **main.asm**
   asm_main: reads the input, calls the appropriate functions, and prints the output.
2. **prime.asm**
   is_prime: returns 1 or 0 depending on whether or not the input is a prime number.
3. **bits.asm**

      a. **count_01:** counts 01 bit sequence patterns.

      b. **count_101:** counts 101 bit sequence patterns.

   4. **Makefile:** To build the project.

Note: The functions must comply with the **default 32-bit C calling convention (cdecl)** and you **must** do this exercise **with Makefile.**

Your code **must** comply with the following rules:

- You must use the **read_int** and **print_int** functions (from the textbook) for I/O.
- You can only use the commands you have learned so far in the class.
- You **must not** print extra output. Results are checked by Script.

Remember that your code will be checked for similarity. In the case of cheating the student will receive a **negative** mark. It is your responsibility to protect your own code.

Please upload your files (including the Makefile) on **vc.kntu.ac.ir.**

Examples:

input1:
5

Output1:
2

calculations:
5 is a prime number so we must count "01"s in input.
0000…101 has only one occurrence of "01" so the output will be 2.

input2:

45

output2:

2

Calculations:

45 is not a prime number so we must count "101"s in input.

00…101101 has two occurrences of "101" so the output will be 2.