BIRZEIT UNIVERSITY

Electrical and Computer Engineering

ENCS2380 – Computer Organization and Microprocessor- Spring 2021

Important Instructions:

- ⇨ Work on this project should be individually (work alone!)
- ⇨ Test your program carefully! Testing is an important part of any programming.
- ⇨ Submit your source code (.s files) and snapshots of output screens of your tests.
- ⇨ Submission will be only accepted on the ITC. Files submitted through Ritaj or email will be ignored.
- ⇨ Late submission will not be accepted.
- ⇨ There may be a discussion online after the submission.
- ⇨ Project mark will be only earned after making the discussion and showing understand of what you have done.
- ⇨ Properly comment your code and try to use procedures. 15% of the assignment mark will be on code comments and modularity (procedures).

Project description:

In this project, you need to implement a simple encryption and decryption algorithm in ARM assembly. Given a text message (string) stored in the memory, the encryption program gets the ASCII code of each character and apply one of the following simple encryption criteria. The encrypted character is stored back in a different location in the memory.

1. Shift left method: shift left ASCII code of each character two bits.
2. Shift right method: shift right ASCII code of each character two bits.
3. Rotate left method: Rotate left ASCII code of each character two bits.
4. Rotate right method: Rotate right ASCII code of each character two bits.
5. Invert the first and the second bits of the ASCII code of each character.

To know which method of the above seven methods you have to use in your project, take the last three digits of your student ID [(**mod** 5) +1]. For example, if your student ID is 1190651, then your encryption method is 2 [(651 mod 5)+1 = 1] which is the shift right method.

Everyone has to write two assembly programs; encryption and decryption. The encryption program takes the text message stored in the memory at specific address and applies the encryption method on every single character and then stores the encrypted message in a different location in the memory. The decryption program takes the encrypted message and applies the reverse of the encryption process, which is called the key. For example, if the encryption method is the rotate left two bits, then its key is to rotate right two bits, and so on.