Programming Assignment 4

Submission Deadline: `12/9/2017 11:59 PM`

Programming Assignment 4 asks you to write and submit the following.

1. CRC32

A 'C' and an equivalent 'ARM' program that takes a string of len N as input from stdin and prints its CRC32 checksum in decimal. You can take reference from the code in these documents:

https://stackoverflow.com/questions/2587766/how-is-a-crc32-checksum-calculated
http://www.hackersdelight.org/hdcodetxt/crc.c.txt

In your code you should define a separate function to calculate the CRC32 checksum and call that function to get it. You need to also submit a write-up explaining the CRC algorithm and how the works in your own words. You will be asked to explain this during the viva.

Constraints:

`N <= 125`

Rubric:
- 1 point for code readability
- 2 points for correctly implementing CRC algorithm with no optimizations AND reverse
- 2 points for correctly implementing CRC algorithm with optimizations AND table lookup
- 1 point for write-up explaining the algorithm
- Institute's plagiarism policy will apply for the writeup as well as the code. ARM code should be self-written, generating code from gcc/g++ will count as plagiarism (we have mechanisms in place to check the same).

Sample Input 1
```
11
HelloWorld!
```

Sample Input 2
```
108
SGVsbG8sIHRoaXMgaXMgQ1JDMzIgYXNz
aWdubWVudCwgQ1JDIGlzIGFuIGF3ZXNv
bWUgYWxnb3JpdGhtIGFuZCBpcyB1c2Vk
IGluIHppcHMu
```

Sample Output 1
```
3083157831
```

Sample Output 2
```
3888115300
```

Note: The assignment submission should be a zip file containing exactly 3 files, 1 in the format <roll_no>_<question_number>_<firstname>.c, 1 in the format <roll_no>_<question_number>_<firstname>.s and the writeup. eg. 2014072_1_palash.c, 2014072_1_palash.s and the write-up (should be in PDF format, preferably in LaTeX).