CSCI 201 Computer Organization I

MIPS Programming Project 1

Due November 1st, 4PM ET

Description:

Assume your Howard ID as a decimal integer is X. Let N = 26 + (X % 11) where % is the modulo operation, and M = N – 10.

You will write a MIPS program that reads a string of exactly 10 characters (including spaces, excluding the null character at the end) from user input.

- For each of the characters in the input,
  - If it is from '0' to '9' and from 'a' to β and from 'A' to Δ, treat it as a single digit base-N number. β stands for the M-th lower case letter and Δ stands for the M-th upper case letter in the English alphabet. In a base-N number, both 'a' and 'A' correspond to the decimal integer of 10, both 'b' and 'B' to 11, and so on. Both β and Δ correspond to N – 1.
  - If it is not in the above specified range, ignore it.
- Sum up all the single-digit base-N numbers from the input, multiply it by (N - 25), then print the result as an unsigned decimal number. If there are no base-N numbers in the input, print 0. NO OTHER CHARACTERS SHOULD BE PRINTED, or it will be marked as wrong.
- The program MUST EXIT after processing one single user input.

Sample test cases (assuming the Howard ID is 12345678):

N = 12345678 % 11 = 4, therefore the base is 26 + 4 = 30, β is 't' and Δ is 'T'.

- Input: 0000000000
  Output: 0
- Input: 0000000001
  Output: 5
- Input: 1000000000
  Output: 5
- Input: 1111111111
  Output: 50
- Input: 9999999999
  Output: 450
- Input: aaaaaAAAAA
  Output: 500
- Input: TTTTTttttt
  Output: 1450
- Input: 12345ABCst
  Output: 525
- Input: vwXYZ!@#$%

Output: 0

- Input: u1wXYZ!b$%
  Output: 60
- Input: u1 b%
  (There are two spaces at the beginning, in the middle and at the end respectively of the above input.)
  Output: 60

Requirements:

- The program must be in a different Github repo than the one for preliminary project.
- The program must be able to run correctly under QtSpim.
- No more commits should be done after the submission deadline.
- The program must be named as project1.s.
- The output must have the exact format as specified above.
- The program must use one or more loops to process the characters in the user input, instead of producing ten segments of similar code with each segment processing one single character.
- All development must be done with Github. Specifically, there MUST BE ONE COMMIT for EVERY **five** or fewer lines of MIPS code (excluding empty lines, and lines with only comment/directives/labels). More frequent commit is acceptable. With each commit, the commit message must explain the purpose of the added/changed code. **The commits must be done while you are developing the program**. Commits after the development completion is NOT ACCETPABLE.
- **Submissions not fully meeting the above requirements will lose significant portion (≥ 70%) of the credits.**
- Syntax error or program terminating abnormally will result in **zero credits**. Therefore, make sure to test your program completely before submission.

Submission:

- Add 'csdrli' (the instructor) as collaborators to your Github repository.
- Create a plain text file named readme.txt. Such a file can be created with notepad on Windows and nano on MacOS or Linux. The file should include ONLY the link to your Github repository that can be used to clone your repo.
- Submit the readme.txt file to http://hucs.dynu.net/lij/courses/submit_hw.html under "CSCI 201 MIPS Programming Project 1". Anything else must not be submitted.