DCC006: Computer Organisation I **(Due: 02/09/19)**

Submission Assignment #1

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Course Policy: Read all the instructions below carefully before you start working on the assignment, and before you make a submission.

- Please typeset your submissions in LaTeXand include your name and IDs with submission.
- Late assignments can be submitted on moodle but there will be a penalty for each day you delay, and the penalty function is in NP :-p.
- You can do this assignment in groups of 2. Please submit no more than one submission per group.
- All sources of material must be cited.
- The goal of this project is to practice your skills in the assembly language. For this, you are going to use the Venus Simulator (http://www.kvakil.me/venus/). Venus is a single cycle simulator that permits you to see what happens inside the registers and to follow the memory tracing of the execution of each line of your code. This simulator is developed by Morten Petersen and has the same ISA as RISC-V, although it has some modifications. You can check the url: https://github.com/mortbopet/Ripes/wiki/RISC-V-Assembly-Programmer%27s-Manual-(Adapted-for-Ripes) to see the modifications of the ISA syntax used by the simulator. Be aware that the class material and the textbook use the 64-bit wide registers but in this simulator we're using 32-bit wide registers. Using the Venus simulator is really simple, you just need to write your code in the tab editor and in the tab Simulator you execute your code. You will see it is easy peasy lemon squeezy!!!!

Problem 1: Evens and Odds (1 points)

Mel just learned in her school that if the last digit of an integer number is divisible by 2, then this number is for sure an even number, otherwise odd. However, Jack doesn't believe on her. Thus your mission is to write a program that checks if a number is even to help Mel show to Jack that this property holds.

Comment: Your program must return 0 if even or 1 if odd.

Problem 2: Factorial (1.5 points)

Doug learned today how to compute the factorial of a given number and he wants to show Diana how he can do it, but he doesn't know assembly. Yous mission is to write an assembly code that computes the factorial of a given number and write comments that are easy to follows.

Problem 3: Permutation (2.5 points)

Suzy loves to make roses combination, and she have numbered the seeds to not get confused and produce more roses of the same colour than she wanted to. The problem is she is always changing the supplier and sometimes she rearrange the seeds in different ways .Besides she always organises the packages of seeds by supplier, like: [1,2,3,4], [4,2,1,3], and so on and so forth. She wants to make sure that every pack has exactly the same types of seeds. Your mission is to design a program that will help her see if the current combination is a permutation of a combination she already had before.

Hint: Check if two integer vectors are a permutation of the other. That is: is [1,2,3] a permutation of [3,1,2]?