CDA 3100 Computer Organization I
Assignment 1

Due Date: Midnight (EST), on the date indicated in the Course Schedule
Submission: Digital Drop Box

Instructions
This assignment exercises MIPS Assembly programming concepts. Although you are encouraged to study with others and to cooperate in understanding lecture and textbook material, you are to work on this assignment individually.

Special Instructions
For programming submissions create an assembly file that conforms to the following:
- The file must have a name in the following format:

    [*LAST6*]-a1.asm

    where: [*LAST6*] = Your last name, only up to 6 characters, with no punctuation.

- The contents of the file must only contain the function label and instructions in your function, which includes the last instruction to return from the function. So given the following sample assembly program:

```
.data                                           # do not submit
     <declare variables passed to the function>   # do not submit
.text                                           # do not submit
__start:
     <load values into argument registers>        # do not submit
     jal   <function label>                       # do not submit
     done
<function label>:                               # submit
     <instructions in function>                   # submit
     jr    $ra                                    # submit
```

    you must only submit the lines above that are commented "# submit".

- You may obtain a copy of the framework for the program from the course Blackboard web site, so that you only need complete the code for the function

Submission
- "Add" your file to your Digital Drop Box on the course Blackboard web site.
- For the Digital Drop Box entry, use the title "Project 1, Section [*student section*] for [*student last name, first name*]". Note that you are to substitute the italicized portion with text appropriate to you personally.
- "Send" your file in the Digital Drop Box. **Be sure to "Send" your file, or you will receive your first zero**.
- Following instructions will be considered part of the grading for this assignment.

Success Requirements
- Assignment is submitted on time.

- Assignment file has proper name.
- File contains correctly operating assembly function.
- Digital Drop Box submission has correct Title.
- Digital Drop Box submission is actually "Sent".
- Assignment is the product of your individual work.

Programming Problem

For the following problem we suggest you put meaningful comments beside each instruction.
Test your code using the *spim* simulator, and be sure it runs under *spim* with no trap file loaded.

1. Below is a C language (or C++ language) function.

```
void ashift (int a[], int n)
{
    int i;

    for ( i = 0; i < n-1; i++)
    {
        a[i] = a[i] + a[i+1] - <constant>;
    }

}  // end function ashift
```

where "*<constant>*" is the numeral representing the last 2 digits of your social security
number.

Write an equivalent MIPS assembly "function" that performs the same operation.
- Label your function 'ashift:' (which is already provided in the program template)
- The address of array 'a' is provided to the function in register $a0
- The value of 'n' is provided in register $a1.
- You may only use save registers ($s0 – $s7), and must be sure to save them on the
  stack and restore them upon completion.
- "Return" the final value of 'i' in value register $v0.