Northwestern University
Department of Electrical Engineering and Computer Science

Programming Assignment 2

EECS 231 Advanced Programming
Fall Quarter 2006

Due : Sunday 10/22/06 at 11:59pm

There are 2 pages to this handout

Goals of this assignment

- Practice loops, conditionals, arrays.
- Introduction to functions, simple string manipulation.

Files

Test cases will be made available on Wilkinson, under `/home/ido715/231/PA2`. Further instructions will be posted to the newsgroup.

1. Log on to Wilkinson.
2. cd to your 231 directory:

   ```
   cd 231
   ```

3. Now get the file from my account:

   ```
   cp ~ido715/231/pa2.tar  .

   tar xf pa2.tar
   ```

4. If you do `ls` now, you should see the directory `PA2`, which contains subdirectories `part1`, `part2` and `part3`. You should also see the submission script `submit`. Do not modify that.

Part 1

Complete problem 8.18, pp.464-466. Your answers can be used as test cases for part 2. Your answers should be in files `test.a` `test.b` and `test.c`

Part 2

Complete problem 8.19, pp. 467-469. Your final program should be in file /PA2/part2.cpp.

Additions:

- If an input SML program tries to access an invalid memory location, your program should print "Fatal error: Memory access violation" and then terminate.
- In the case of overflow as a result of an arithmetic operation, your program should print "Fatal error: Overflow" and then terminate.
- If an opcode is not recognized, your program should print "Input error: Invalid instruction" and terminate.

Part 3

Complete parts (d), (e), (g), (h). Make sure you save a working copy of your part2 before you start working on this problem. Your final program should be in file /PA2/part3.cpp.

Clarifications

- The opcode for part (e) should be 50.
- The opcode for part (g) should be 51.
- The opcode for part (h) should be 52.

Programming advice

Do not place everything into one big main function. Instead, create well-defined functions for the different modules of your program. Typically, the main function is small. For example:

```
int main () {
   // declare variables
   load_program(...);
   execute_program(...);
   return 0;
}
```

In order to facilitate debugging, use const ints rather than #defines for the opcodes. Otherwise, avoid the usage of global variables.

If you find yourself repeating a chunk of code in your program, then you probably need to place it in a function.

Follow the commenting guidelines as posted in the PA1 handout.

How to submit your assignment

Move up to directory `PA2/` and type `tcsh submit` to run the submission script. You may resubmit your assignment as many times as you need. **IMPORTANT NOTE:** As of 10/13, the mail program on Wilkinson appears to be broken. The current script will only archive your files and you'll have to email them manually. I will modify this, and inform you, as soon as the mail program works again.