Winter ’18 CIS 314 Assignment 6 – 100/100 points – Due Friday, 3/2, 11:59 PM

Please submit individual source files for coding exercises (see naming conventions below) and a single solution document for non-coding exercises (.txt or .pdf only), when appropriate. Your code and answers need to be documented to the point that the graders can understand your thought process. Full credit will not be awarded if sufficient work is not shown.

1. [70] Write a Y86 program that sorts an array of integers.

- (10) Allocate a hardcoded input array similar to that used by asum.ys (linked on course examples page) with at least 10 entries.
- (30) Implement a *sort* procedure that sorts the input array using Bubble Sort. Your *sort* procedure should sort the array in place – there’s no need to allocate additional memory for an output array.
- (10) Have your *sort* procedure call your *swap* procedure from assignment 5 to perform the actual swaps in memory.
- (10) Implement a *main* procedure to call your *sort* procedure, passing the input array and array length as arguments.
- (10) Follow the register usage conventions outlined in B&O’H section 3.7.3.

Name your source file 6-1.ys.

2. [30] Consider the following Y86 code:

```
addl %edx %eax
mrmovl 0(%ecx) %edx
addl %edx %eax
```

How many pipeline stalls (or bubbles) are required when running the above code with and without forwarding (see sections 4.5.5-4.5.8 in the textbook)? Draw pipeline diagrams to support your answers (see Figure 4.43). Write your answers in your solutions document.

Zip the source files and solution document (if applicable), name the .zip file <Your Full Name>Assignment6.zip (e.g., EricWillsAssignment6.zip), and upload the .zip file to Canvas (see Assignments section for submission link).