

## CSc 480 — Questions About Computer Architecture

1. Read the historical notes on pp. 113-116 of the Hennessy and Patterson book, then answer the following:

- (a) Which machine was designed to support ALGOL?
- (b) What machines did Seymour Cray help design?
- (c) Two people mentioned in the notes have won Turing Awards. Who are they, and what machines did they design?
- (d) Which machines have you heard of before? Where/how did you hear of them?

2. Suppose we have the following C or Java declarations:

```
int s;  
int a[100];
```

Read the description of the DLX architecture on pp. 97-102, and then analyze the following DLX assembly code. What does it compute? Answer by giving a code fragment in C or Java, *and* by adding a comment to each line of the program to explain what that instruction is doing.

```
      LI    R1, #0  
      LI    R2, #0  
      LI    R3, #0  
      LI    R4, #100  
loop  SLT   R5, R1, R4  
      BEZ   R5, done  
      LW   R6, a(R2)  
      ADD  R3, R3, R6  
      ADDI R1, R1, #1  
      ADDI R2, R2, #4  
      J    loop  
done  SW   R6, s(R0)
```

In the code, items like #0 are immediate fields, register R0 always contains the constant 0, *s* is the memory address of variable *s*, and *a* is the base address of array *a*.