COS126: General Computer Science **Spring 1996**

Exercise # 2

Handed out:Feb. 27, 1996

These exercises are meant to guide class discussion and to help you prepare for exams. (Note that there are 3 "midterms" in this course.) *Do not* turn in solutions.

1. What does the following C program print?

```
#include <stdio.h>

int g = 11;

int First (int i)
      { int x = g % i;
        g = g / i;
        return x; }

int Second (int x, int r)
      { return(g*x + r);}

void main (void)
      { int x, i = 3;
        x = Second(i, First(i));
        printf("%d\n", x);
      }
```

2. What does array A contain after execution of the following C program? Show your work.

```
int A[6] = {11, 7, 5, 3, 1, -2};

void main (void)
      { int i;
        for (i = 5; i > 0; i--)
            if (A[i-1] > A[i])
              { int temp = A[i-1];
                A[i-1] = A[i];
                A[i] = temp;
               }
      }
```

3. Write the following binary numbers in hexadecimal and decimal notations: `00011101001`, `10100010`.

4. Write the following hexadecimal numbers in decimal: `AA14, CD5`.

5. What do each of the following TOY instructions (written in hexadecimal) do? `AA14, 59DE, B26A`

6. If this 16-bit word is interpreted as a Toy instruction, what does this instruction do? `1100000100010110`.

7. The contents of Toy memory addresses 00-05 are shown below. If the PC is set to 00 and GO is pressed, what are the contents of these memory addresses when the Toy machine halts?

```
00:   B200
01:   9125
02:   1111
03:   A125
04:   0000
05:   0009
```