CSE 361S Intro to Systems Software
Assignment #3

Due: Thursday, Nov. 12, 2009.


4. B&O p. 579: problem 7.12. For the address, what is being asked for is its address in the .text segment.

5. Consider the following datatype definition on a 32-bit x86 machine:

```c
typedef struct {
    char c;
    double *p;
    int i;
    double d;
    short s;
} struct1;
```

a. Using the template below (allowing a maximum of 32 bytes), indicate the allocation of data for a structure of type `struct1`. Mark off and label the areas for each individual element (there are 5 of them). Cross hatch the parts that are allocated, but not used (to satisfy alignment). Assume the following alignment rule: data types of size x must be aligned on x-byte boundaries. **Clearly indicated the right hand boundary of the data structure with a vertical line.**

```plaintext
0   1   2   3   4   5   6   7   8   9   10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28  29  30  31
```

b. How many bytes are allocated for an object of type `struct1`?

c. What alignment is required for an object of type `struct1`? Consider the implications of a declaration of the form `struct1 foo[4];`

b. If we define the fields of `struct1` in a different order, we can reduce the number of bytes wasted by each variable of type `struct1`. What is the number of unused, allocated bytes in the best case?