

CS314 Fall 2002
Assignment 9
Due 12/4 (Kremer) and 12/5 (Ryder)

1 Problem — Memory Layout

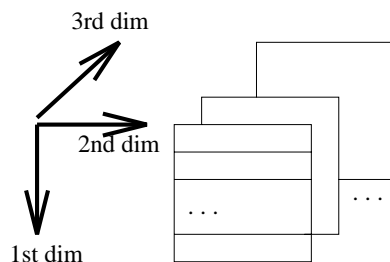
```
struct foo_struct {  
    float pressure[40][20][100];  
    int angle;  
    double speed;  
} foo;
```

```
foo.angle = ...  
foo.pressure(5, 3, 78) = ...  
foo.pressure(2, 19, 1) = ...  
foo.speed = ...
```

1. Give the layout of the data object `foo` that specifies the location of each of its components relative its base (starting) address. All addresses are word addresses. `double` requires two words, while `float` and `int` have single word representations.

Assume that the memory layout for a `struct` object consists of mapping all component fields one after the other, i.e., according to textual sequence, into memory.

Assume that the array references for each dimension start with 0, i.e., the range of possible indices in our example is $[0..39, 0..19, 0..99]$. Give a layout address function of the three-dimensional array that is an extension of the row-wise layout for two-dimensional arrays.



2. Give the addresses for the four component accesses of `foo` shown above.

2 Problem — Parameter Passing

Louden 8.9