Fundamentals of Computing: Lecture 24

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September 25, 2009

Structures

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```
# line 170 "lecture23.lhs"

struct Vector2D{
  double x;
  double y;
};

struct Vector2D origin = {0.0,0.0};
```

This declares that Vector2D is a combination of 2 doubles.

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```

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Accessing the fields

```
struct Vector v;
printf("v is the vector (%f,%f)", v.x, v.y );
```

Fields are both l-values and r-values

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```
typedef struct Vector2D Vector2D;
  Vector2D addVector(Vector2D u, Vector2D v)
  {
    Vector2D w;
    w.x = u.x + v.x;
    w.y = u.y + v.y;
    return w;
  }
```

Java programmers please note

Structures are *not* passed as reference to functions.

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```
#line 214 "lecture23.lhs"
#include <stdio.h>
void printVector(struct Vector2D);
void shiftByOneUnit(struct Vector2D u);
int main () {
  printf("Before shift: ");printVector(origin);
  shiftByOneUnit(origin);
  printf("After shift: ");printVector(origin);
}
void shiftByOneUnit(struct Vector2D u){
  u.x = u.x + 1;
}
void printVector(struct Vector2D u){
  printf("(%f,%f)\n",u.x,u.y);
}
```