Lecture 14: Structs

CSE 29: Systems Programming and Software Tools

Aaron Schulman (Shalev)

Introducing struct datatypes

- Up until now all variables have been ether single elements or arrays

```
int latitude;
int longitude;
```

- struct is a datatype that can combine elements into one variable

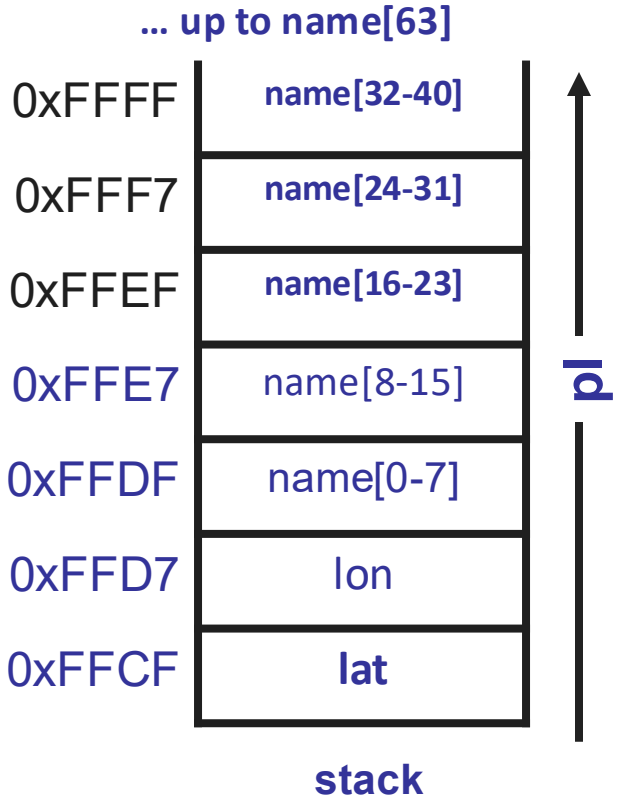
```
struct place {
    int latitude;
    int longitude;
};
```

Data members (or member variables)

Using struct datatypes

```
struct place {
    long int lat; // Latitude
    long int lon; // Longitude
    char name[64]; // Name
};

int main() {
 struct place pl;
 pl.lat = 10315;
 pl.lon = 11561;
 return 0;
}
```



Passing a struct to a function

```
long int distance(struct place p1, struct place p2) {
    // Compute the distance from p1 to p2
    return ((p1.lat – p2.lat)**2); // not actual distance
}

int main() {
  struct place dca = {389072, -770369};
  struct place san = {327157, -1171611};
  long int dist = distance(dca, san); // structs will be copied ☹
}                                     // now two copies on stack
```

Passing a struct to a function as a ptr

```
long int distance(struct place* p1, struct place* p2) {
    // Compute the distance from p1 to p2
    return ((p1->lat – p2->lat)**2); // not actual distance
}

int main() {
  struct place dca = {389072, -770369};
  struct place san = {327157, -1171611};
  long int dist = distance(&dca, &san); // one copy only!
```