Week 4

- Compound data types
- Structs, enums, unions

Given the following task:

- You are a Fortnite developer

- You want a method that returns the current gun
- You want a method that gets a gun and does pew pew
- Each gun has ammo and damage

Where do we have trouble?

- Returning multiple values
- Making clear some values build a bigger structure
- Structuring data in general

Just use a class?

OOP (Pre Alpha)

- C has no Classes
- C has no inheritance
- C has no function overloading
- C has no private/public/protected keywords

BUT

- C has ways to combine types into a new type
- Introducing:

STRUCT

Combine multiple data types into a bigger one

- Concert ticket: Date, Time, Location and Band

- Date: Day, Month, Year
  Day, Month and Year: int

- Time: Hour, Minute
  Hour and minute: int

- Location: Row and Column
  Row and Column: unsigned int

- Band: Name
  Name: Some amounts of characters

Struct

- struct is a keyword in C

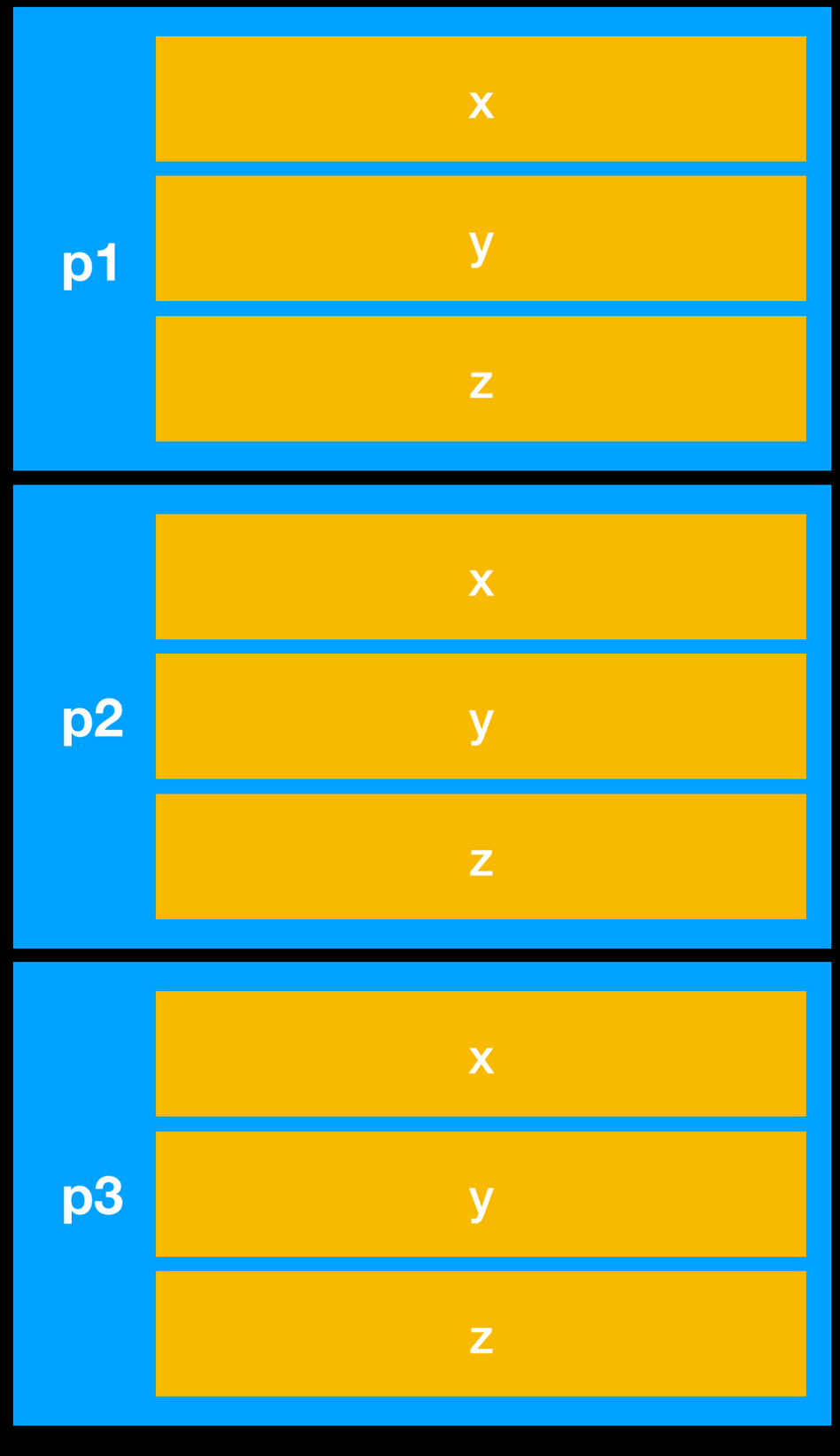
- There are three ways to deal with structs, only one is used really often

Syntax of a struct

- struct [Tag] {
  member;
  member;
  } [variables];

“Just Structs”

```
struct Point{
        float x;
        float y;
        float z;
    } p1, p2, p3;
```



„Named structs“

```c
struct Point{
        float x;
        float y;
        float z;
    };

int main(){

    struct Point p1;
    struct Point p2;
    struct Point p3;

    printf("%f\n", p1.x);
    printf("%f\n", p2.z);
    printf("%f\n", p3.x);

    return 0;
}
```

Tres Hombres

```
struct Point{
        float x;
        float y;
        float z;
    } p1;
```

```
struct{
        float x;
        float y;
        float z;
    } p1;
```

```
struct Point{
        float x;
        float y;
        float z;
    };

struct Point p1;
```

typedef

- Used to give other names to types
- typedef unsigned char BYTE
  BYTE b = 18;
- Can be used to create a new type from a struct

Literally types

```c
 struct Point{
        float x;
        float y;
        float z;
    };

int main(){
    struct Point p1;
    struct Point p2;
    struct Point p3;

    printf("%f\n", p1.x);
    printf("%f\n", p2.z);
    printf("%f\n", p3.x);

    return 0;
}
```

```c
typedef struct{
    float x;
    float y;
    float z;
} Point;

int main(){
    Point p1;
    Point p2;
    Point p3;

    printf("%f\n", p1.x);
    printf("%f\n", p2.z);
    printf("%f\n", p3.x);

    return 0;
}
```

Exercises

- Create a Gun struct that holds an amount of remaining ammo, ammo in the clip and damage
- Write a method to calculate how many times the gun can reload until it runs out of bullets
- Write a method that reloads the gun
- Write a „pew“ method that shoots a bullet and print the damage done

More Exercises

- A player has a gun, a shield (0-100) and health (0-100)
- Write a method that calculates damage done to a player by a gun
- A player is able to drink a shield potion or take a medkit to increase his life, write methods for that

Even More Exercises

- A person has some amount of money and a family is made up from 3 persons (mom, dad and a fortnite playing kid)

- The kid wants to buy skins, write a method that takes 20$ from the fathers money away