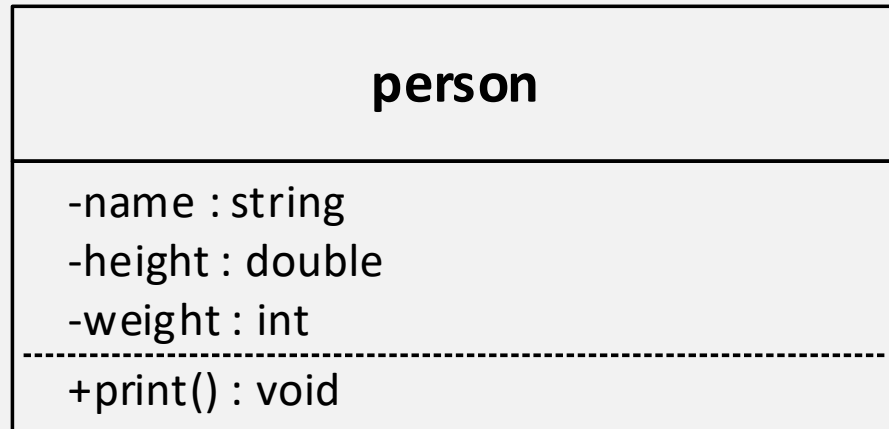# MEMBER FUNCTIONS AND PROGRAM ORGANIZATION

Defining and Calling

Member Functions

Delroy A. Brinkerhoff

MEMBER FUNCTION CALLS
ARE BOUND TO OBJECTS

person
-name : string
-height : double
-weight : int
+print() : void

```
p0.print();
p1.print();
p2.print();
```

p0	Dilbert
	5.9
	175

p1	Alice
	5.02
	120

p2	Wally
	5.6
	190
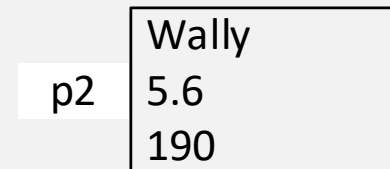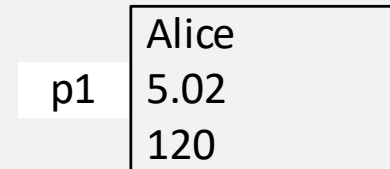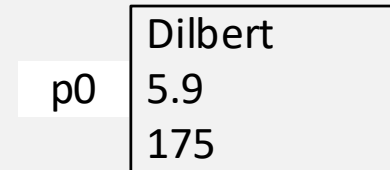
NON-MEMBER FUNCTIONS: THE STRUCTURE ADD FUNCTION

```
Time add(Time t1, Time t2) // struct version
{
    int i1 = t1.hours * 3600 + t1.minutes * 60 + t1.seconds;
    int i2 = t2.hours * 3600 + t2.minutes * 60 + t2.seconds;

    return make_time(i1 + i2);
}
```

TIME CLASS AND ADD MEMBER FUNCTION

```cpp
class Time
{
    private:
        int hours;
        int minutes;
        int seconds;
    public:
        Time add(Time t2)
        {
            int i1 = hours * 3600 + minutes * 60 + seconds;
            int i2 = t2.hours * 3600 + t2.minutes * 60 + t2.seconds;
            return Time(i1 + i2);
        }
};
```

CALLING THE ADD FUNCTION

STRUCT VERSION

```
Time x;

Time y;

Time z;

      ...

z = add(x, y);
```

CLASS MEMBER VERSION

```
Time x;

Time y;

Time z;

      ...

z = x.add(y);
```

IMPLICIT VS. EXPLICIT

IMPLICIT

- implied
- suggested
- not visible

EXPLICIT

- fully revealed
- exposed
- visible

IMPLICIT AND EXPLICIT ARGUMENTS

PROTOTYPES

- `Bar foo();`
- `Bar foo(Bar t2);`
- `Bar foo(Bar t2, Bar t3);`

FUNCTION CALLS

- `x.foo();`
- `x.foo(y);`
- `x.foo(y, z);`

MEMBER FUNCTION
DEFINED INSIDE THE CLASS

```
Time y;
Time z;
    . . .
Time x = y.add(z)
```

```
Time add(Time t2)
{
    int i1 = hours * 3600 + minutes * 60 + seconds;
    int i2 = t2.hours * 3600 + t2.minutes * 60 + t2.seconds;

    return Time(i1 + i2);
}
```

MEMBER FUNCTION
DEFINED OUTSIDE THE CLASS

```
Time y;
Time z;
    . . .
Time x = y.add(z)
```

```
Time Time::add(Time t2)
{
    int i1 = hours * 3600 + minutes * 60 + seconds;
    int i2 = t2.hours * 3600 + t2.minutes * 60 + t2.seconds;

    return Time(i1 + i2);
}
```

TYPICAL PROGRAM ORGANIZATION

```
class Bar
{
    int function();
};
```
Bar.h

```
#include "Bar.h"

int Bar::function()
{
        ....
}
```
Bar.cpp

```
#include "Bar.h"

Bar b;
int i = b.function();
```
client.cpp