

MC140: lecture #9

today's topic:

functions

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functions.

- C programs are divided up into modules
- the modules are called *functions*
- functions are made up of sequences of statements
- main() is a function
- two types:
 - pre-defined
 - programmer-defined

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pre-defined functions.

- C comes with pre-defined functions
- you have already used:
 - main()
 - printf()
 - scanf()
- I use the () to indicate that these things are *functions*

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libraries.

- pre-defined functions are grouped in *libraries*.
- for example:
 - stdio
 - math

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stdio library.

- standard I/O
- I/O = input/output
- examples:
 - printf()
 - scanf()

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math library.

- mathematical functions
- examples:
 - sqrt()
 - pow()
 - exp()
 - log()
 - sin()
 - cos()

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programmer-defined functions.

- functions are:
 - declared
 - defined
 - called

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familiar example.

```
function name → int main { void } ← begin function
function type → printf( "hello world\n" );
return( 0 );
end function → } ← function body
```

- function is enclosed in { }
- stuff between { } is called *function body*

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function syntax.

```
data type (e.g. int, void, etc.) → <type>
name of function → <name>
begin function block → {
body of function → <declarations>
<statements>
end function block → } /* end of function */
```

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why?

- modular programming makes life easier
- you can re-use code
- useful if you want to do something more than once
- useful if you want to do something similar to something you've just done

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example I .

```
function definition → #include <stdio.h>
int square( int );
int main( void ) {
    int x;
    for ( x=1; x<=10; x++ ) {
        printf( "%d ", square( x ) );
    } /* end of for */
    printf( "\n" );
    return( 0 );
} /* end of main() */
function declaration → int square( int y ) {
    return( y * y );
} /* end of square() */
```

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example II .

- ascimation
- death star example (ds.c on web page)

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reading.

- material covered today:
 - DD: 5.1-5.6
- *assignment #3 is due wednesday*
- *exam #1 is FRI 9 FEB*
- *review on wednesday (7 feb)*
- *office hours WED 7 FEB: 10am-12noon*
(NOT 4.30-6pm)