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C's origins...

- Originally Developed in 1972 by Dennis Ritchie at Bell Labs.
- The original "K&R" C book was the informal language spec (co-authored with B. Kernighan)
- Has had enormous influence on other modern programming languages.

Brian Kernighan

Dennis Ritchie

01:39 21:08

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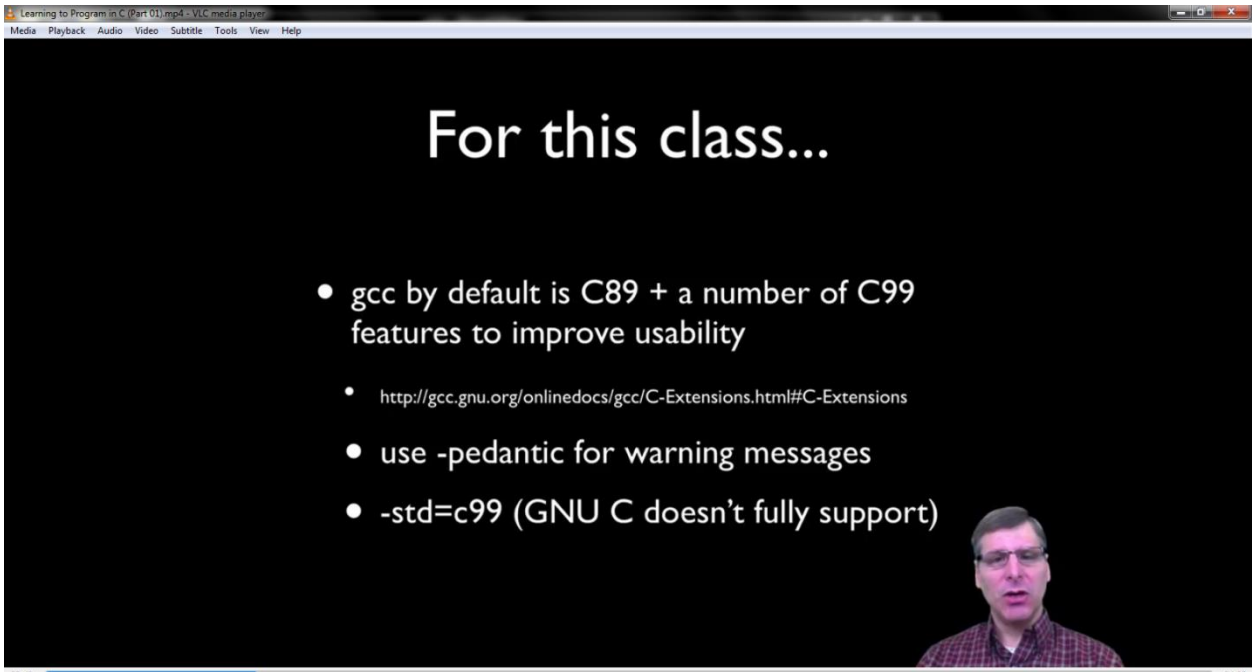
C Standardization

- "K & R" C
- ANSI C - (aka C89 or C90)
  - most portable...
  - -ansi, -std=c89
- C99
  - extends C89/C90, new data types, variable length arrays.

03:22 21:08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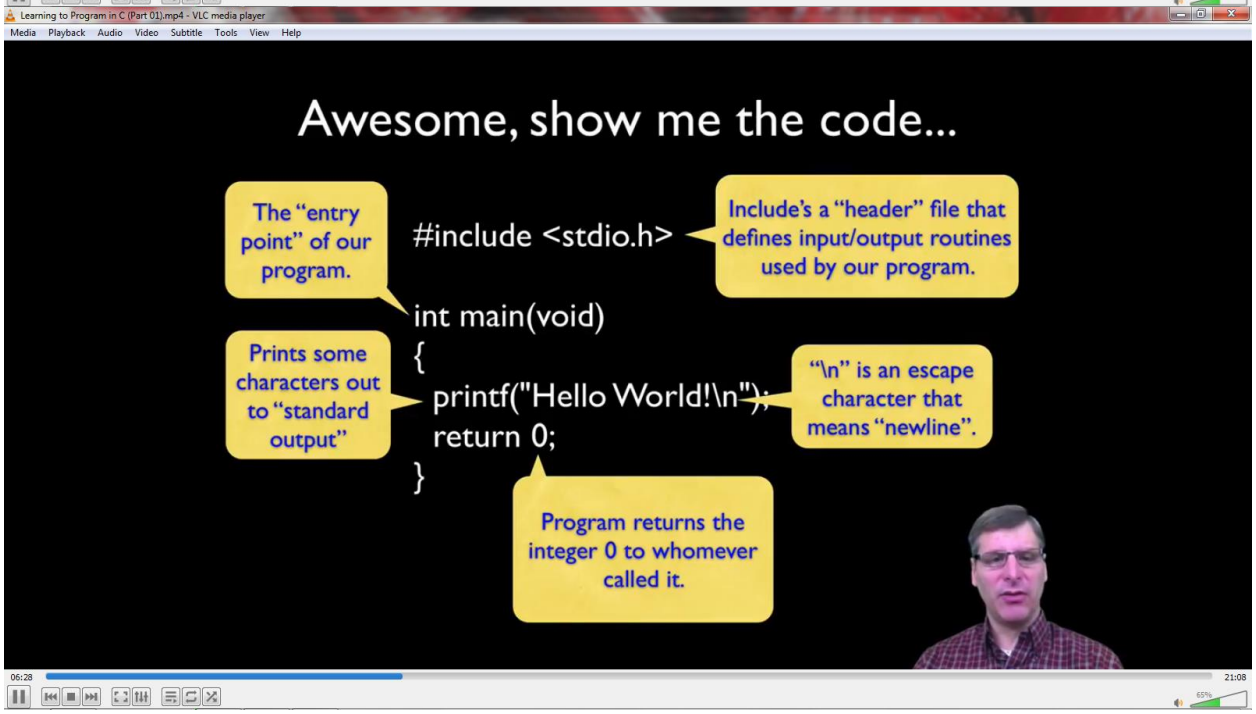
For this class...
gcc by default is C89 + a number of C99 features to improve usability
http://gcc.gnu.org/onlinedocs/gcc/C-Extensions.html#C-Extensions
use -pedantic for warning messages
-std=c99 (GNU C doesn't fully support)
03:49
21:08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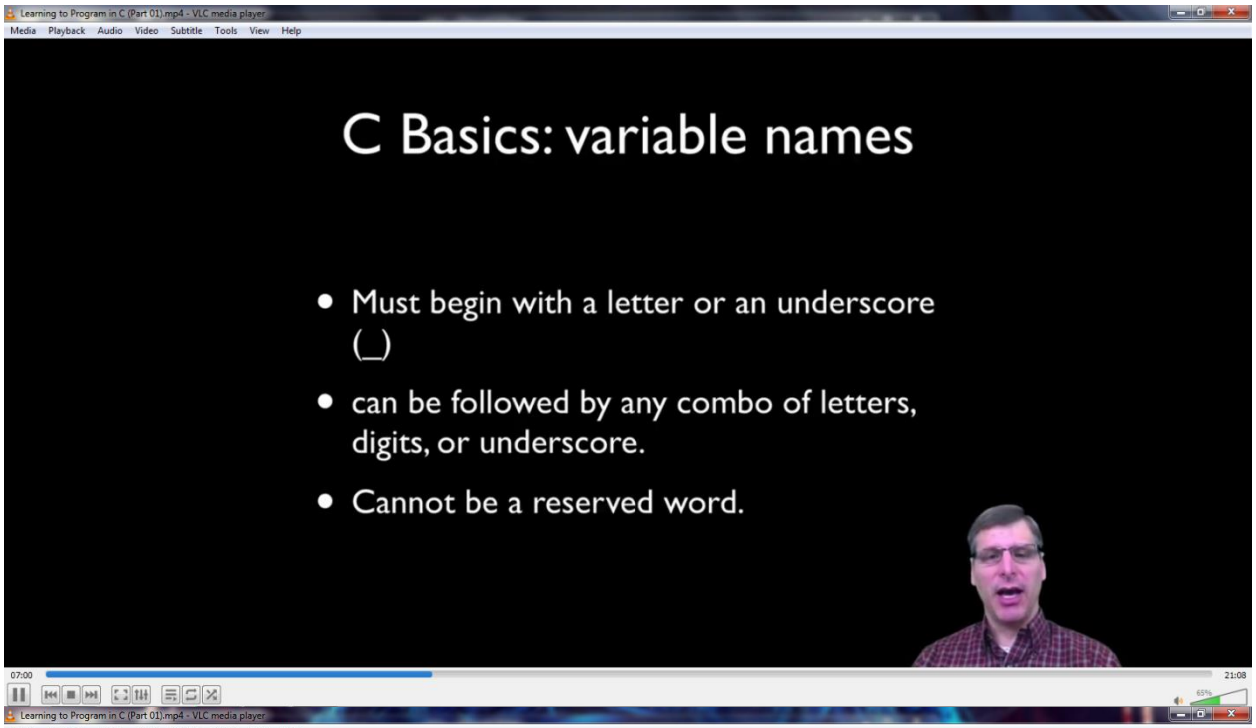
Awesome, show me the code...
The "entry point" of our program.
#include <stdio.h>
Include's a "header" file that defines input/output routines used by our program.
int main(void)
{
printf("Hello World!\n");
return 0;
}
Prints some characters out to "standard output"
"\n" is an escape character that means "newline".
Program returns the integer 0 to whomever called it.
06:28
21:08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C Basics: variable names
Must begin with a letter or an underscore (_)
can be followed by any combo of letters, digits, or underscore.
Cannot be a reserved word.
07:00
21:08


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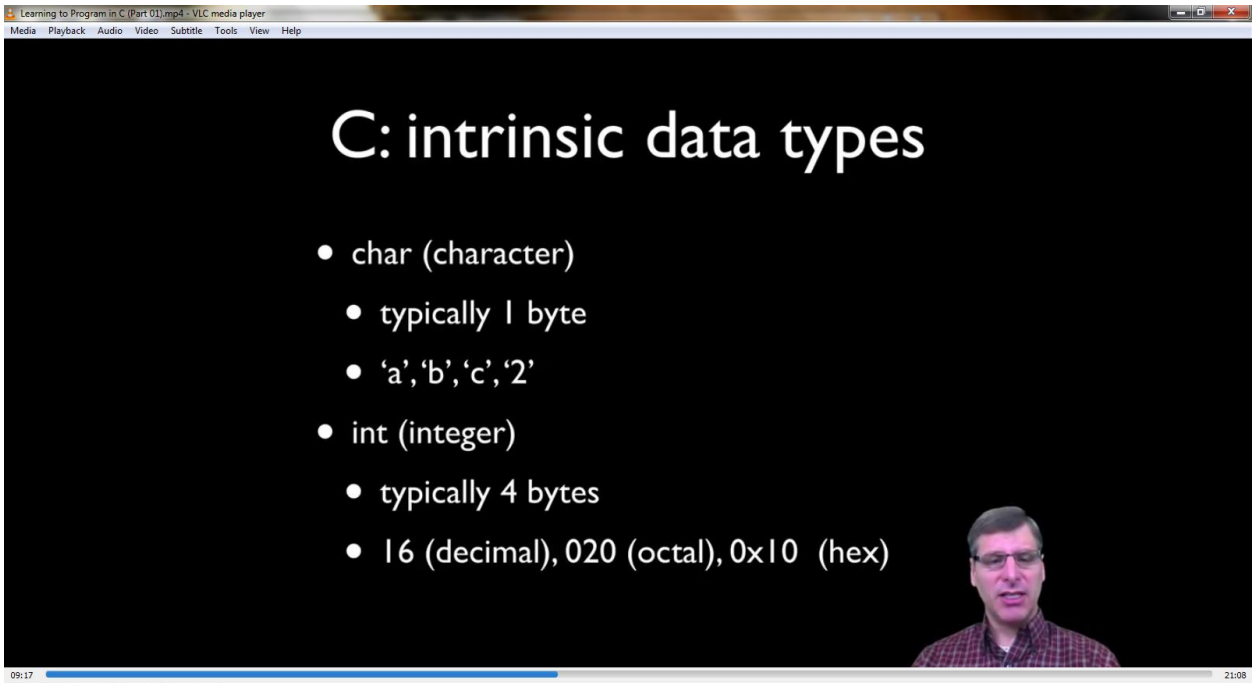
variable names (cont)
Valid
cnt
_myPtr
go4it
testCase
_very_nice
Invalid:
won@last
3_Times
char
first name
08:19
21:08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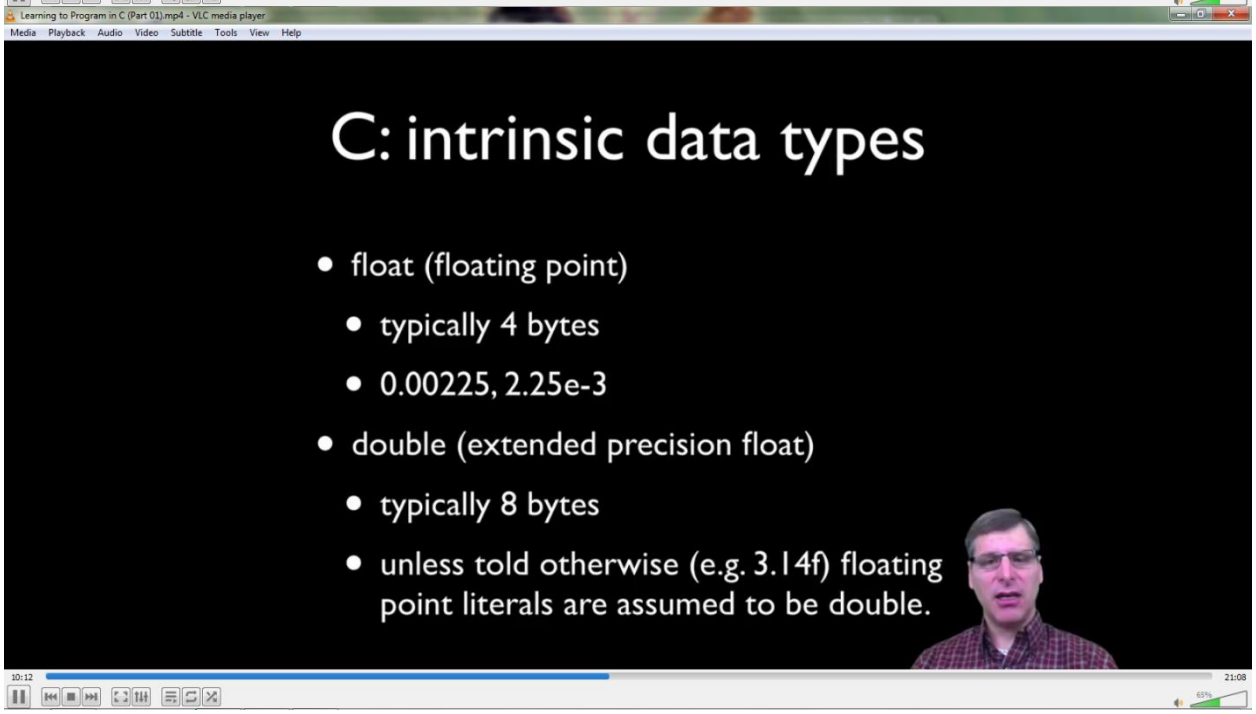
C: intrinsic data types
• char (character)
• typically 1 byte
• 'a', 'b', 'c', '2'
• int (integer)
• typically 4 bytes
• 16 (decimal), 020 (octal), 0x10 (hex)
09:17
21:08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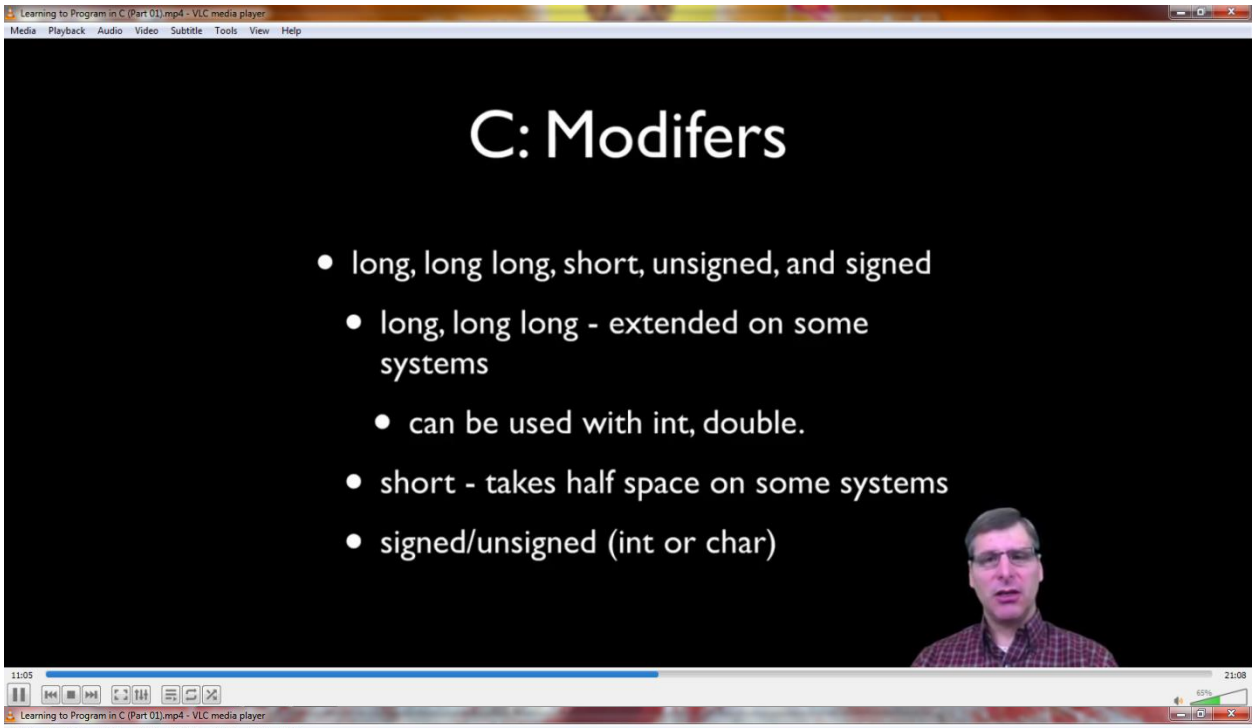
C: intrinsic data types
• float (floating point)
• typically 4 bytes
• 0.00225, 2.25e-3
• double (extended precision float)
• typically 8 bytes
• unless told otherwise (e.g. 3.14f) floating point literals are assumed to be double.
10:12
21:08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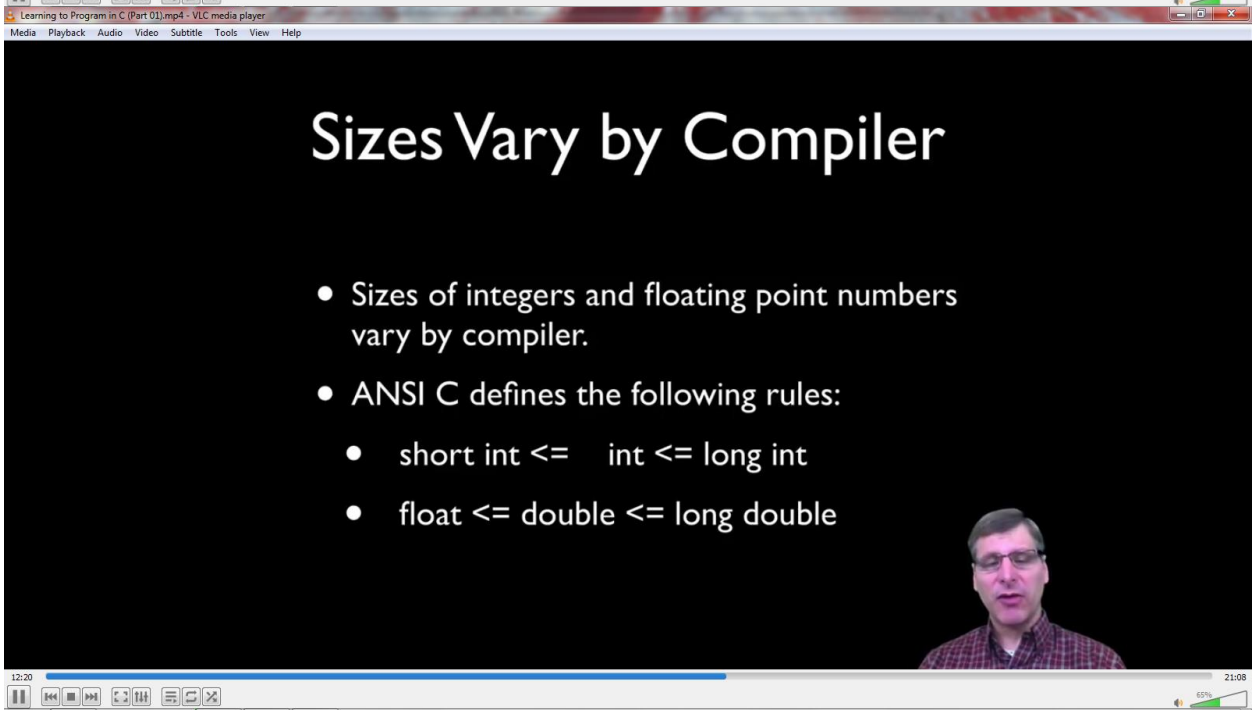
C: Modifers
long, long long, short, unsigned, and signed
long, long long - extended on some systems
can be used with int, double.
short - takes half space on some systems
signed/unsigned (int or char)
11:05
21:08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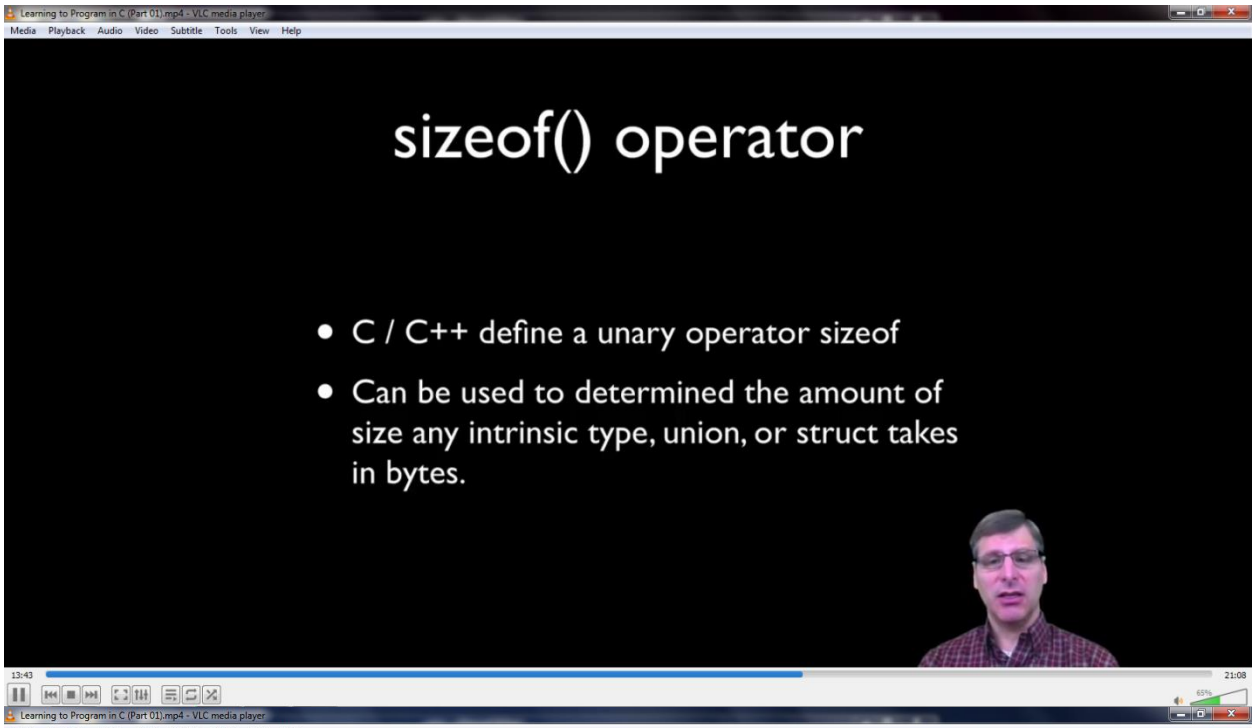
Sizes Vary by Compiler
Sizes of integers and floating point numbers vary by compiler.
ANSI C defines the following rules:
short int <= int <= long int
float <= double <= long double
12:20
21:08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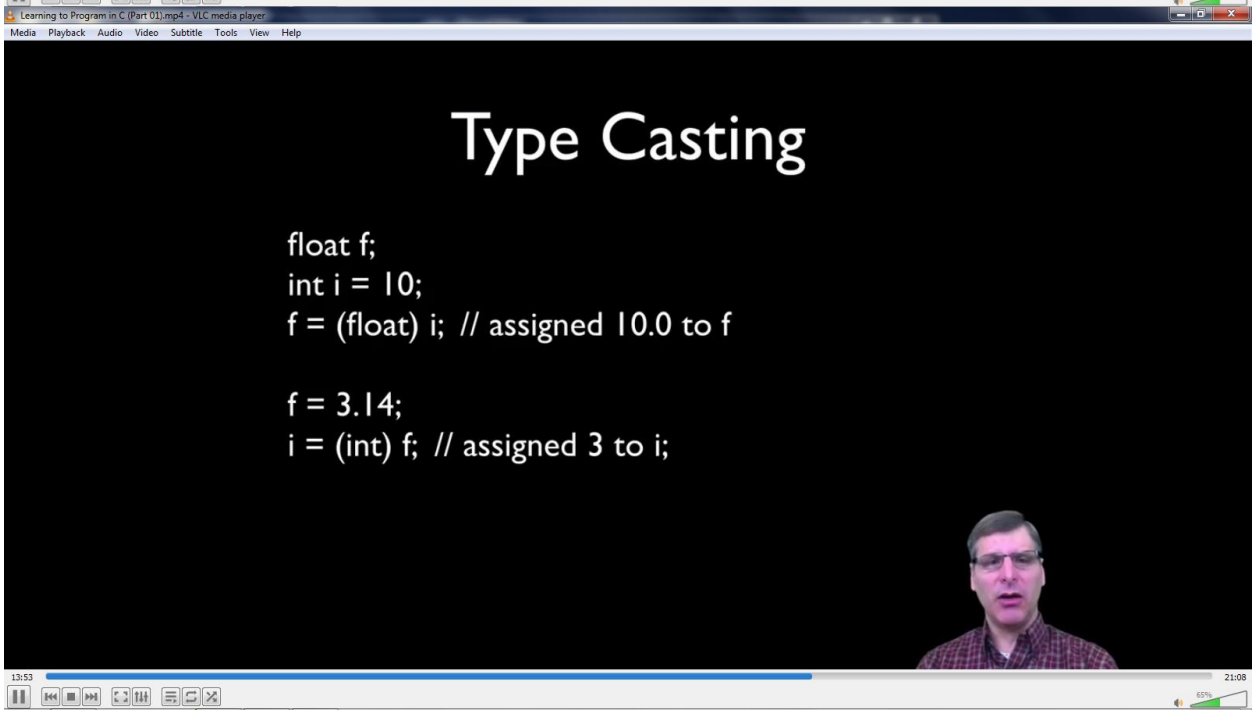
sizeof() operator
C / C++ define a unary operator sizeof
Can be used to determined the amount of size any intrinsic type, union, or struct takes in bytes.
13:43
21:08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Type Casting
float f;
int i = 10;
f = (float) i; // assigned 10.0 to f
f = 3.14;
i = (int) f; // assigned 3 to i;
13:53
21:08