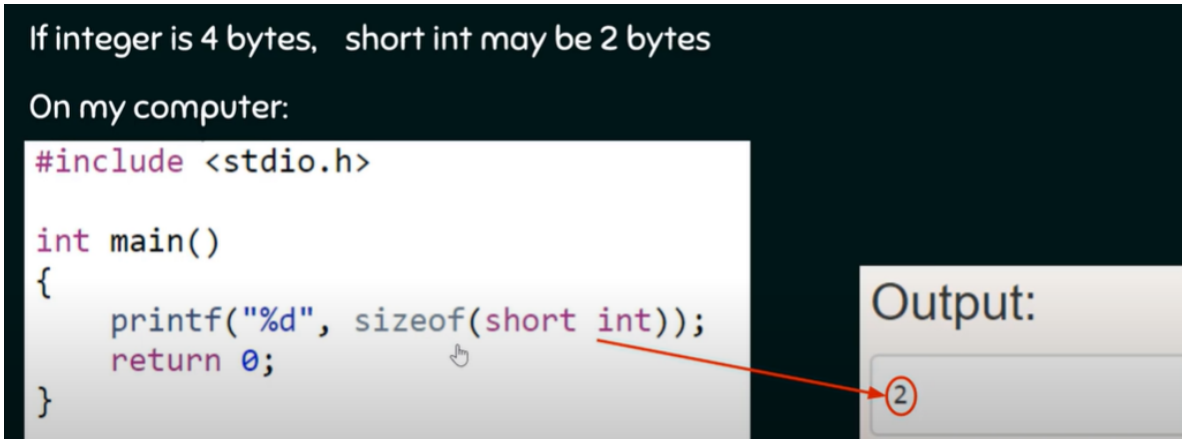
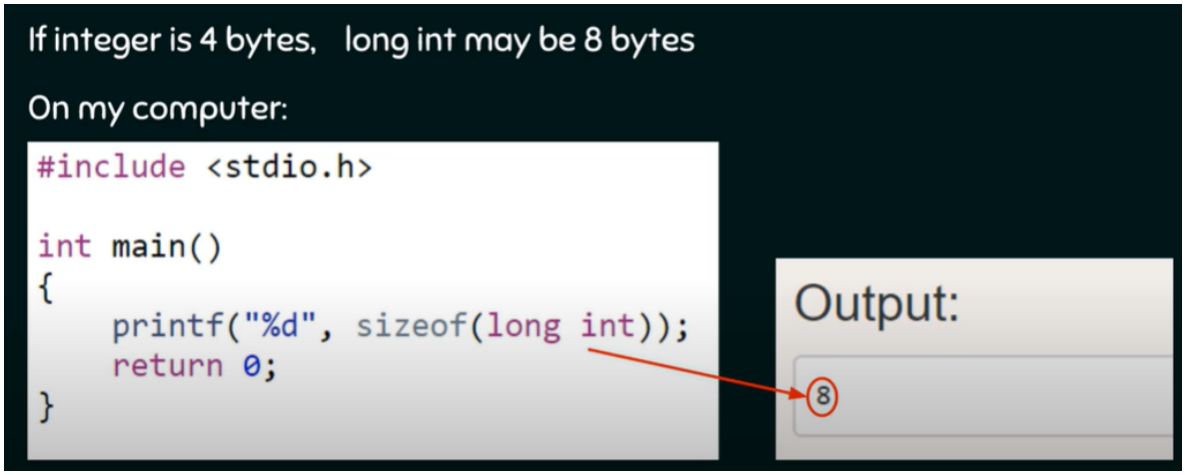
Lesson 7

Fundamental Data Types — Integer (Part 2)

- ## OutLine
  - **Modifiers (short, long, signed, unsigned) used for integer**
  - **Some programming examples**
- ## Long and Short





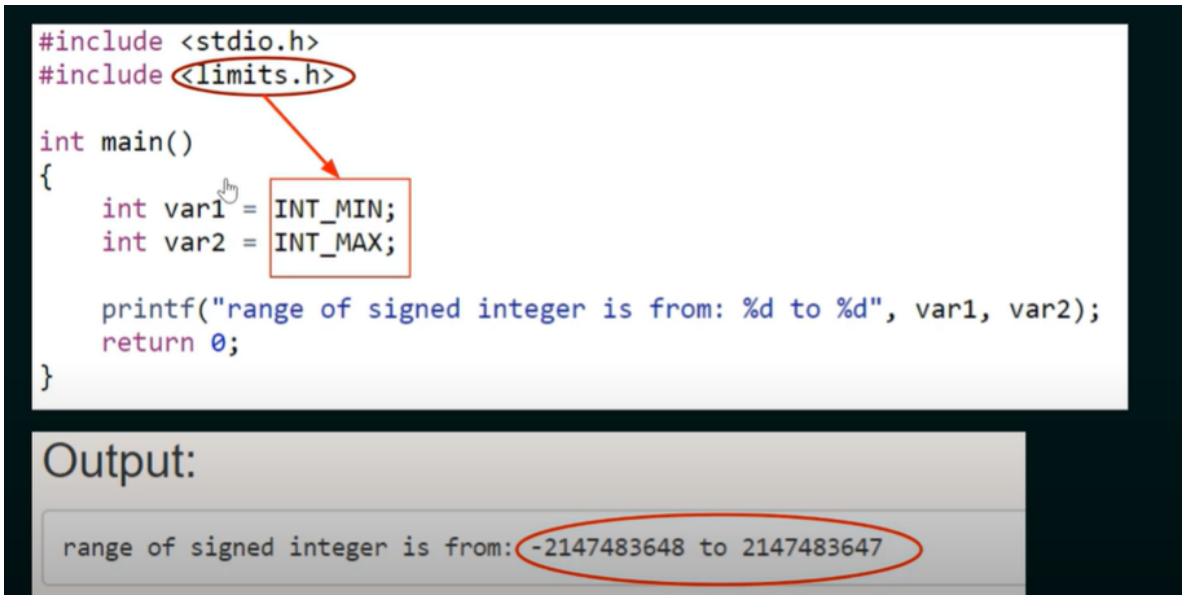
sizeof(short) <= sizeof(int) <= sizeof(long)

Note: by defult int some_variable_name; is signed intger variable.
(默认情况下变量是有符号整型变量)

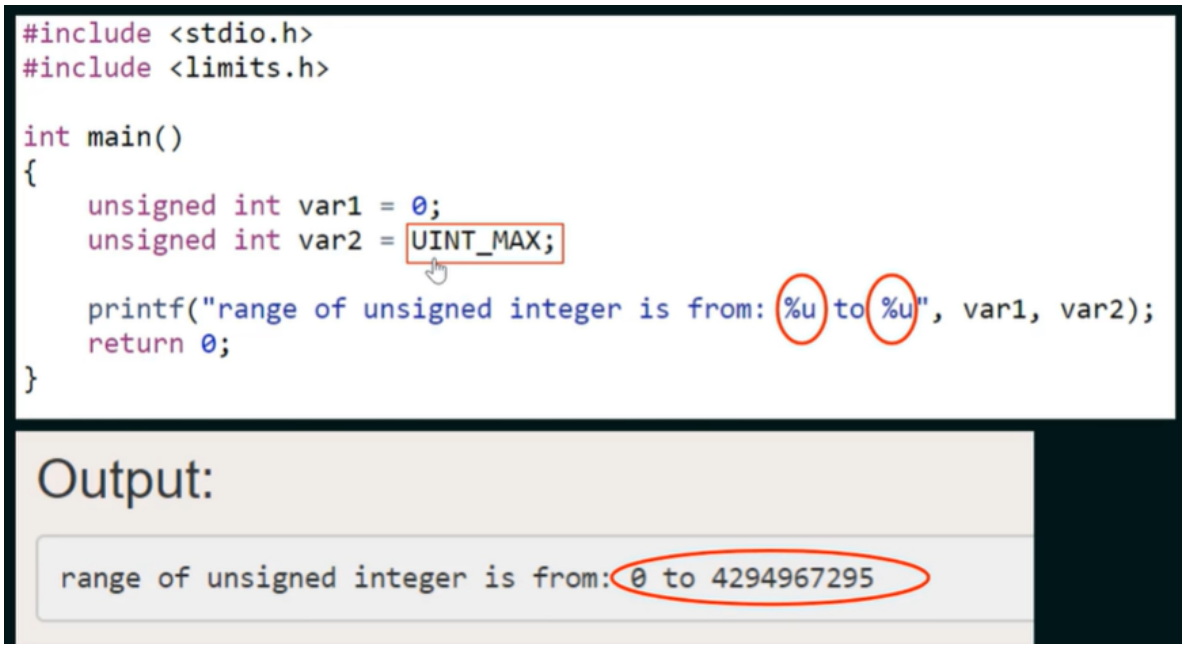
Unsigned int some_variable_name; allows only positive values.
(无符号整型变量仅允许正值)

- ## Programming Examples

example_1



example_2



0表示无符号整数的最小值，UINT_MAX表示无符号整数的最大值

example_3

```c
#include <stdio.h>
#include <limits.h>

int main()
{
    short int var1 = SHRT_MIN;
    short int var2 = SHRT_MAX;

    printf("range of short signed integer is from: %d to %d", var1, var2);
    return 0;
}
```

Output:

```
range of short signed integer is from: -32768 to 32767
```

example_4

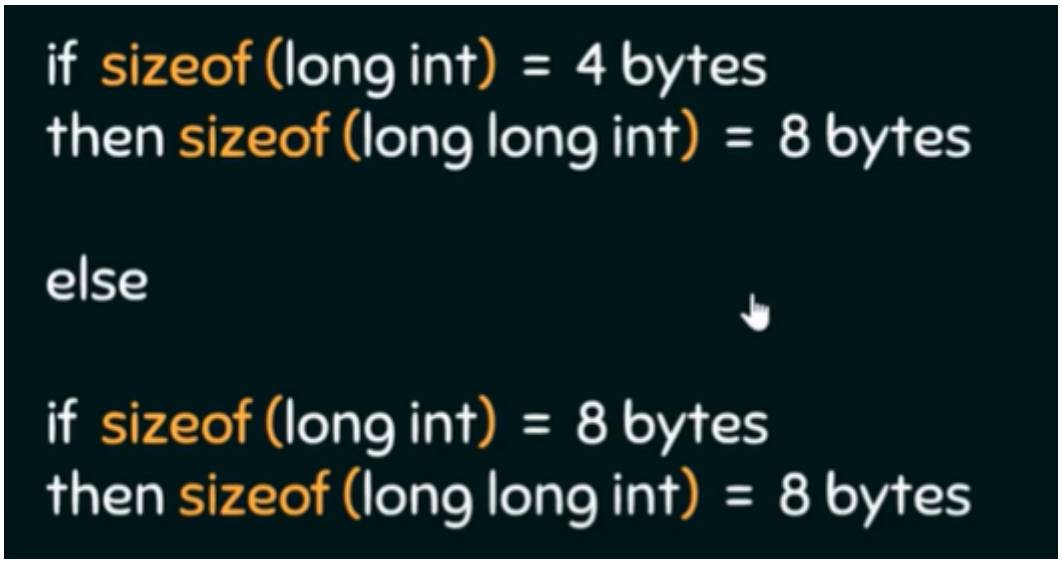
```c
#include <stdio.h>
#include <limits.h>

int main()
{
    short unsigned int var1 = 0;
    short unsigned int var2 = USHRT_MAX;

    printf("range of short unsigned integer is from: %u to %u", var1, var2);
    return 0;
}
```

Output:

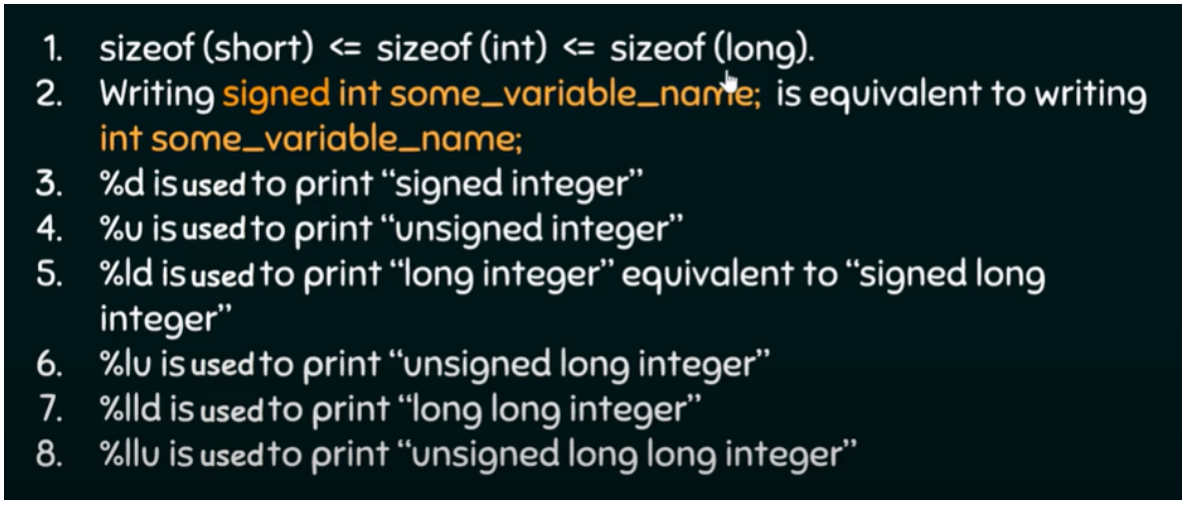
```
range of short unsigned integer is from: 0 to 65535
```

同样可以将 short 替换为 **long** 来检查长整型的范围，但是需要注意的是：在printf中需要使用 **%ld** 替换 %d 表示长整型，用 **%lu** 替换 %u

Long Long Int



- **Summary**


1. sizeof (short) <= sizeof (int) <= sizeof (long).
2. Writing signed int some_variable_name; is equivalent to writing int some_variable_name;
3. %d is used to print "signed integer"
4. %u is used to print "unsigned integer"
5. %ld is used to print "long integer" equivalent to "signed long integer"
6. %lu is used to print "unsigned long integer"
7. %lld is used to print "long long integer"
8. %llu is used to print "unsigned long long integer"