Casting

A way to treat a value as another type

char to int
float to int
long long to double

Strange Behavior

```
float f = 1.31;
int n = (int) (f * 10000);
printf("%i\n", n);
```

What does this output?

13099

Why?

Imprecision

Floats aren’t perfect.

Can only represent numbers to a certain number of significant figures

```
float f = 1.31;
printf("%.8f\n", f);
```

What does this output?

1.30999994

Switches

```
printf("Give me a number between 1 and 4\n");
int n = GetInt();
switch (n)
{
    case 1:
        printf("Low\n");
        break;
    case 2:
    case 3:
        printf("Middle\n");
        break;
    case 4:
        printf("High\n");
        break;
    default:
        printf("Wrong\n");
        break;
}
```

Scope

The range that a declared variable extends

```
for (int i = 0; i < 10; i++)
{
   // STUFF
}

printf("%d\n", i);
```

Strings

string is char*
ends with '\0'

NULL != '\0'

Arrays

Continuous blocks of memory

Instant access — `name[index]`

Zero-Indexed

Declared `type name[size]`

'H'	'E'	'L'	'L'	'O'	'\0'

Command-Line Arguments

Gets input from the user as arguments to main

```
int main(int argc, string argv[])
```

argc is the number of arguments

argv is the array of arguments (last is `NULL`)

Security

To be truly secure, you rely on no one, and you allow no one access to any of your information

Which is why everyone builds their own computers, operating systems, and programs from scratch, and don’t connect to any other machine

Cryptography

We have secrets

Sometimes we have to move our secrets through insecure channels

We want them to stay secret

So, we encrypt them

Debugging

GDB is the best

Commands include:
break
print
next
step

Searching

Linear search:

Look through the search space one element at a time

Binary search (needs sorted elements):

Go to the middle of the elements
See if the element you’re looking for is larger or smaller
Reduce the search space accordingly
Repeat