C programming language

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origins

Dennis Ritchie in 2011 / CC BY 2.0

Brian Kernighan in 2012 / CC BY 2.0

comparison

Java	C
object-oriented	procedural
interpreted	compiled
`String`	`char` array
condition (`boolean`)	condition (`int`)
garbage-collected	no memory management
references	pointers
exceptions	error codes

- in Java, everything is a method that is called on an object
- in C, everything is a function

- in Java, source code is compiled to byte code, which is then interpreted by Java VM
- in C, source code is compiled into binary machine code

- in Java, String is a class
- in C, a string is just an array of `char` values which ends with the `char '\0'`

- in Java, the Java VM takes care of deallocating memory used
- in C, any memory you allocate, you must also deallocate

hello, world

```c
#include <stdio.h>

int main()
{
  printf("hello, world\n");
  return 0;
}
```

```
$ gcc -o helloworld helloworld.c
$ ./helloworld
hello, world
```

conditions

- under what conditions will each of the following be execute?

```
if (x) {
  /* ??? */
}
if (x-y) {
  /* ??? */
}
if (x=y) {
  /* ??? */
}
```

add evens

- create program called `addEven.c` that adds all the even numbers between 1 and 100 and prints the sum

add evens cont.

- modify `addEven.c` to get maximum value from the command-line instead of hard-coded as 100

```c
#include <stdio.h>

int main(int argc, char * argv[])
{
  printf ("(%d) %s:%s\n", argv[0], argv[1]);
  return 0;
}
```