

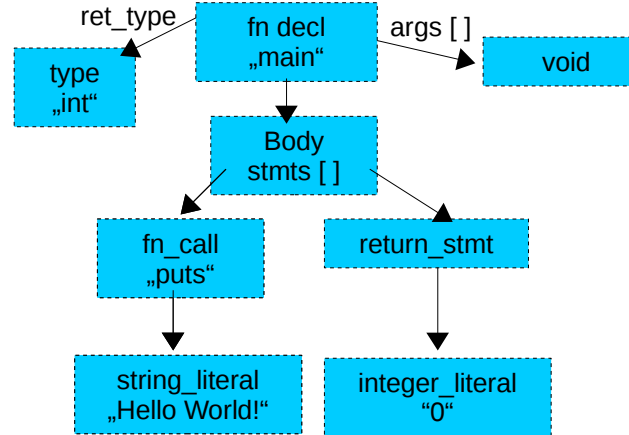
Source Code

```
int puts(char* c);
int main(void){
    puts("Hello World!");
    return 0;
}
```

main.c

compiler performs
preprocessing,
parsing,
type resolution
...

Abstract Syntax tree (AST) In Memory, machine usable representation of the programm

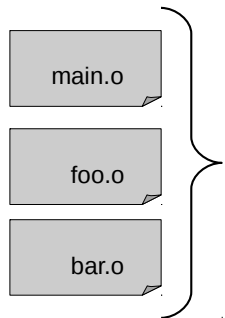


Object File contains a list of symbols (functions or data constants) and the associated machine code contains „holes“ for unknown symbols

```
457f 464c 0102 0001
0000 0000 0000 0000
....
```

main.o

compiler performs
IR translations,
optimizations,
register allocation,
...

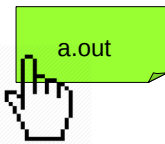


linker fills in "holes"
by cross referencing symbols
in different object files and
inserting their memory addresses
(and executes linker scripts, LTO, etc.)

a.out

Some Application (like a File
Explorer or a Terminal)
requests the OS to run the
Application

(on linux this is achieved by using the syscalls
fork and execve)



The Operating System loads the
file into RAM and begins executing
the instructions from the Entry Point.
(which is defined in libc's _start wich initializes libc's dynamic
libraries, initializes some components and then calls main)

