

## Static Library Demonstration.

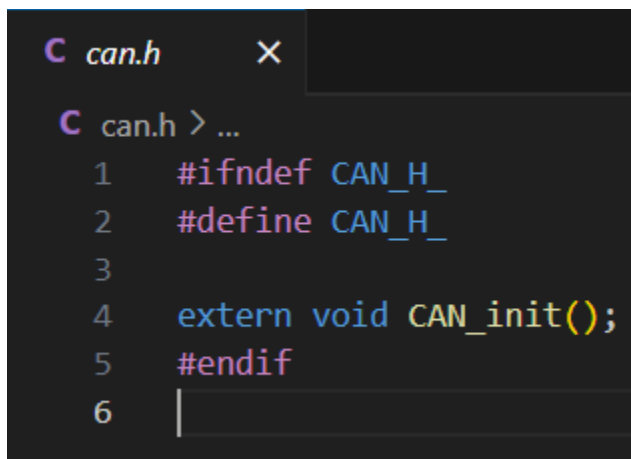
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In the C programming language, a static library is a compiled archived file(.a) containing a group of relocatable object files which contains all symbols required by the main program to operate (functions, variables etc.).Static library object files instead are loaded near the end of compilation during its linking phase.

Creating a Static Library:

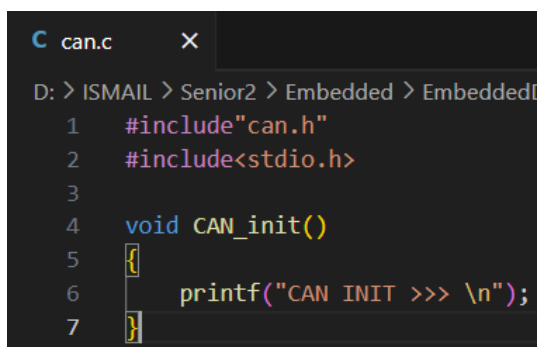
-Create header files containing declarations.

A screenshot of a code editor window titled 'C can.h'. The editor shows the following C code:

```
1  #ifndef CAN_H_
2  #define CAN_H_
3
4  extern void CAN_init();
5  #endif
6  |
```

We use "extern" so we tell the compiler that the symbols included in the headers will be resolved at linking time.

-Create Source files containing definitions for declarations.

A screenshot of a code editor window titled 'C can.c'. The editor shows the following C code:

```
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1  #include "can.h"
2  #include <stdio.h>
3
4  void CAN_init()
5  {
6      printf("CAN INIT >>> \n");
7  }
```

-Compile these files to create object file(.o) only without linking:

```
gcc -c can.c
```

Note: -c is an option to compile and assemble, but do not link.

```
Ismail@DESKTOP-804MG0N MINGW64 /d/ISMAIL
son1/Static-Library (main)
$ gcc -c can.c

Ismail@DESKTOP-804MG0N MINGW64 /d/ISMAIL
son1/Static-Library (main)
$ ls
build.bat  can.c  can.h  can.o  main.c
```

-Archive the object files into a static library.

```
Ismail@DESKTOP-804MG0N MINGW64 /d/ISMAIL/Senior2/
son1/Static-Library (main)
$ ar -rcs libCan.a can.o

Ismail@DESKTOP-804MG0N MINGW64 /d/ISMAIL/Senior2/
son1/Static-Library (main)
$ ls
build.bat  can.c  can.h  can.o  libCan.a  main.c
```

-Using the newly created static library we can link it with the main normally without the source file.

```
$ ls
build.bat  can.h  libCan.a  main.c

Ismail@DESKTOP-804MG0N MINGW64 /d/ISMAIL/Senior2/
son1/Static-Library (main)
$ gcc main.c libCan.a -o main.exe

Ismail@DESKTOP-804MG0N MINGW64 /d/ISMAIL/Senior2/
son1/Static-Library (main)
$ ./main.exe
CAN INIT >>>
```