Assignment 5.1 Writeup

Operating Systems (CSE231)

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In this assignment, we had to implement a **BootLoader** in **Protected Mode** that would print "**Hello world!**" and then the contents of the **CR0** register on the **QEMU** terminal.

To do this I wrote an **Assembly Language** program. To make this program a Bootloader we use the memory address **0x0000:0x7C00** and use the **dw** and **times** commands at the end of the code to specify to the **BIOS** that it is a Bootloader. We start the program in **16** bit mode which then switches to **32** bit or **protected mode**. Next we create a **Global Descriptor Table** or **GDT** to define a Data Segment that will help us open the protected mode using the **CR0 control register**. Once we are in the protected mode, the code runs a loop that prints our message and then another loop that prints the contents of the CR0 register.

In the **Makefile**, we compile the **asm file** into a **bootable binary file** using the **NASM** compiler and then run the binary file using the **QEMU** emulator which prints our output on its terminal. So all we need to do to load the bootloader in the BIOS is run the **make** command in the terminal in the folder that contains our source code and Makefile.