How to create a Linux Kernel that will print Hello World on the output screen when it is booted up.

Linux kernel will boot up from the harddisk

and we are using redhat linux 7 for this purpose.

Following is the assembly language code for kernel

create a new file boot.asm and paste the following code in it.

```
ORG 0x7c00
BITS 16

start:
   mov si, message
   call print
   jmp $

print:
   mov bx, 0
.loop:
   lodsb
   cmp al, 0
   je .done
   call print_char
   jmp .loop
.done:
   ret

print_char:
   mov ah, 0eh
   int 0x10
   ret

message: db 'Hello World!', 0
```

times 510-($ - $$) db 0

dw 0xAA55

Now install nasm and qemu on your linux system using commands

dnf install nasm

dnf install qemu

Now write the following command to make a binary file named as boot.bin from boot.asm using nasm which is an assembler and disassembler for the Intel x86 architecture.

and qemu is a machine emulator that can run operating systems and programs for one machine on a different machine.

nasm -f bin boot.asm -o boot.bin

above command will create a boot.bin binary file and this file will print Hello World on the output screen in qemu emulator. this boot.bin file is a small linux kernel which will print Hello World on boot up.

Now following command will invoke qemu emulator to print Hello World using boot.bin file

qemu-system-x86_64 hda boot.bin

After running the above command you will see Hello World on qemu Emulator

hda option means Set a virtual hard drive and use the specified image file for it.