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Exercise 1

BOOT LOADER PROGRAM:

Program 1.

Boot loader that does nothing

Code (first.asm):

```
[BITS 16]
[ORG 0X7C00]
JMP $
TIMES 510-($-$$) db 0
DW 0xAA55
```

Compiling the program:

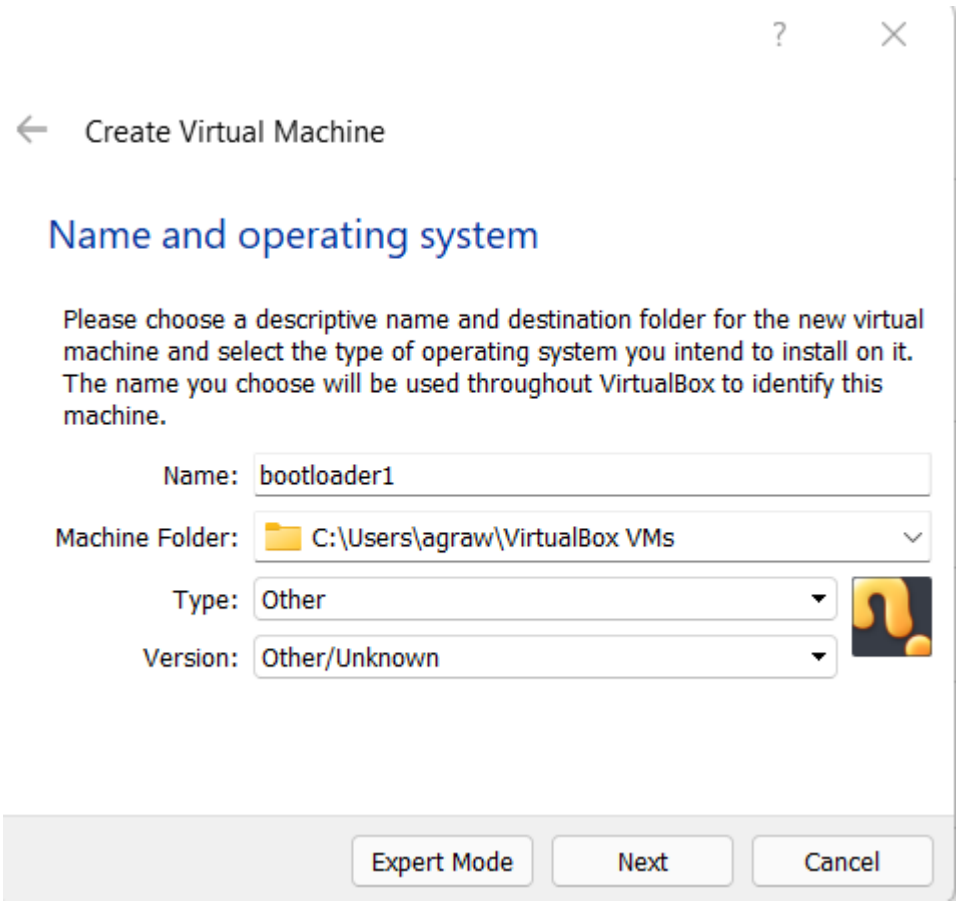
```
shubhangi@Shubhi:/mnt/e/vit/4thsem/os/lab/linuxpractice/20bce1161/lab2_bootloader$ nasm first.asm -f bin -o boot.bin
shubhangi@Shubhi:/mnt/e/vit/4thsem/os/lab/linuxpractice/20bce1161/lab2_bootloader$ ls
boot.bin  first.asm
```

Creating a floppy image:

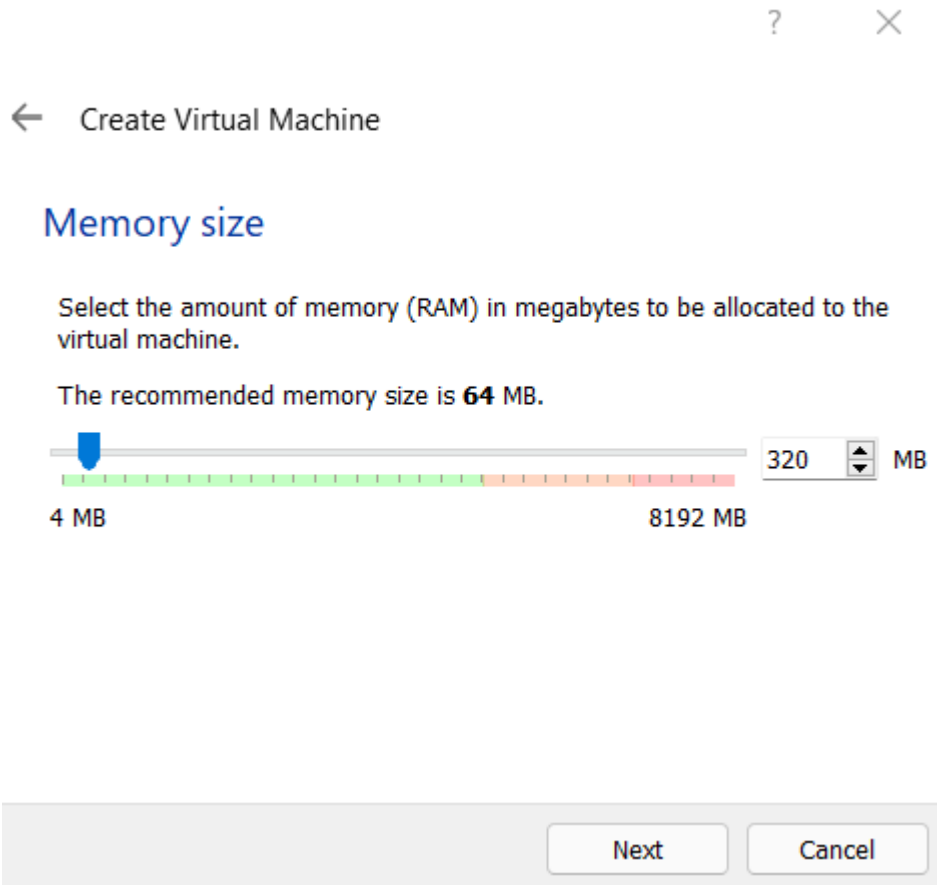
```
shubhangi@Shubhi:/mnt/e/vit/4thsem/os/lab/linuxpractice/20bce1161/lab2_bootloader$ dd if=boot.bin bs=512 of=floppy1.img
1+0 records in
1+0 records out
512 bytes copied, 0.00567524 s, 90.2 kB/s
shubhangi@Shubhi:/mnt/e/vit/4thsem/os/lab/linuxpractice/20bce1161/lab2_bootloader$ ls
boot.bin  first.asm  floppy1.img
```

Attaching the floppy image to the newly created Virtual machine and boot:

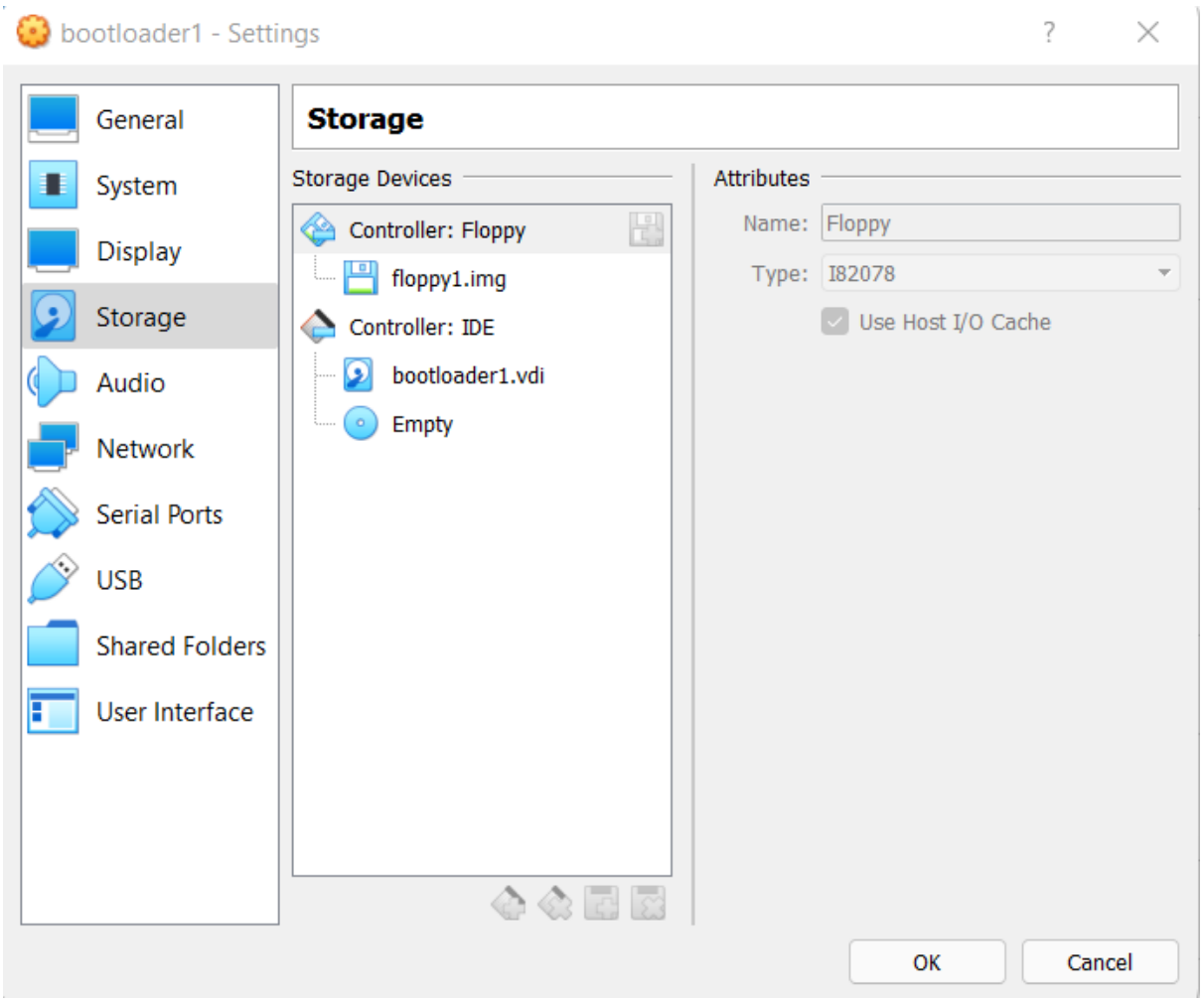
1) Create a new VM instance and give it a name, (here we gave as “bootloader1”. Specify its type as “Other”.



2) Give it a memory size, and keep clicking on next for the subsequent windows.

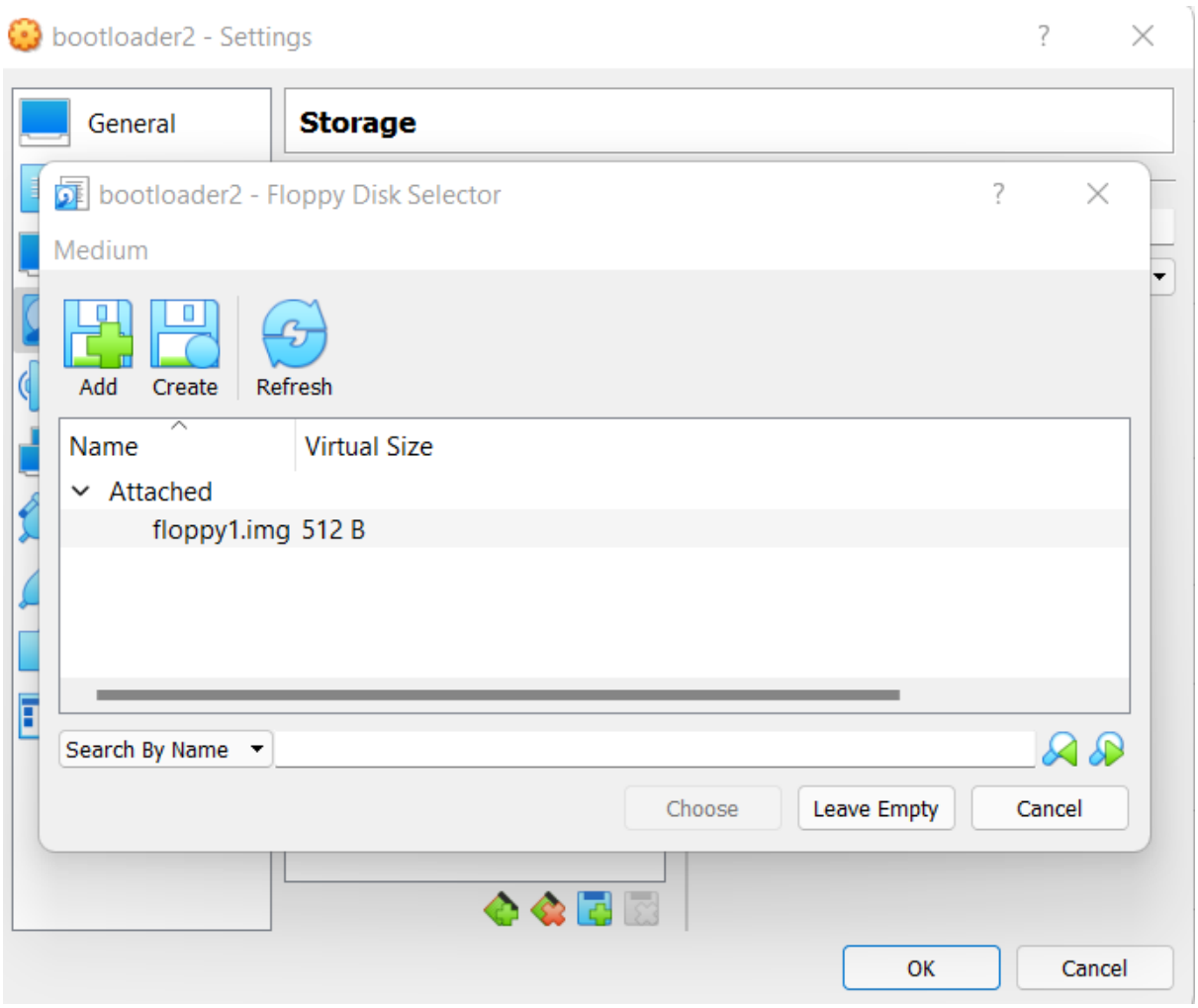


3) Click on settings after selecting the newly created instance and go to storage

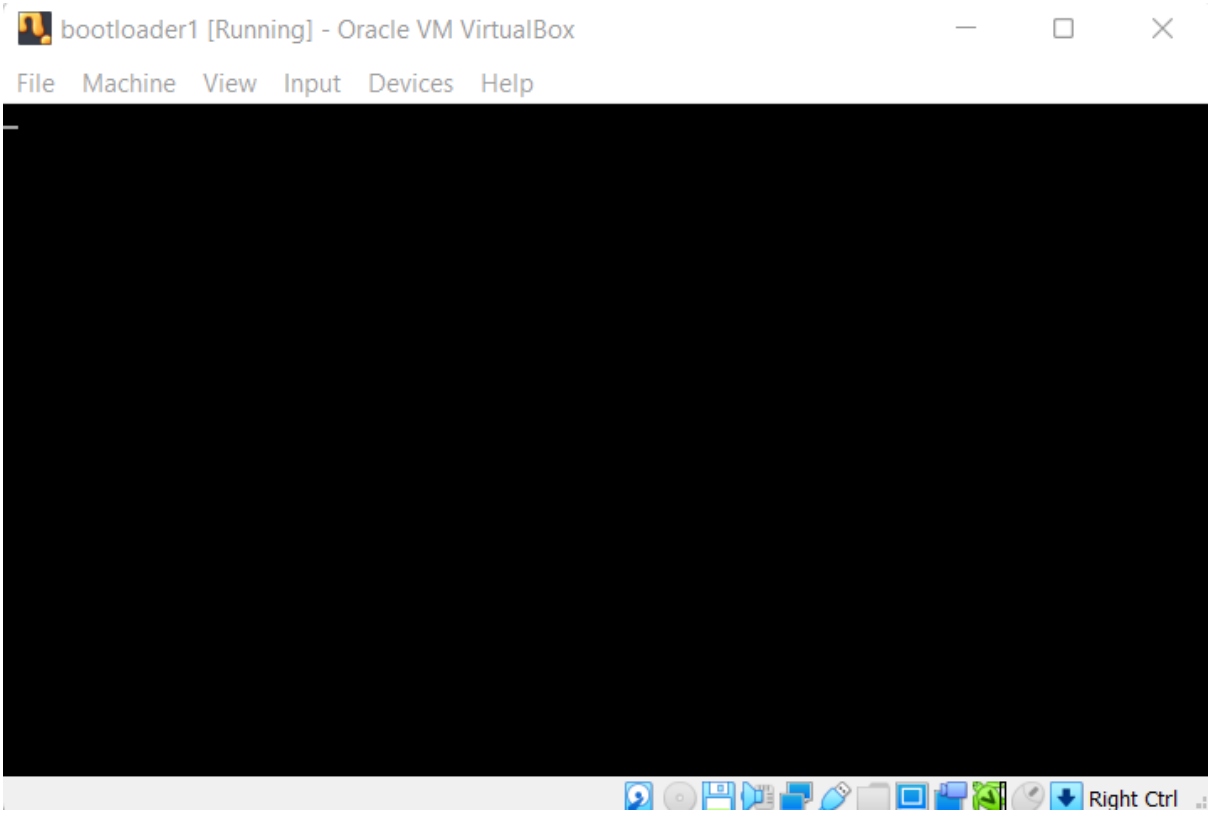


Click on the diamond icon at the bottom and then click on Floppy option and then attach the dot img file just created.

Now click on OK and you can run your bootloader program.



Since, this bootloader program does nothing, we can see a blank screen with cursor:



Pgm 2. Boot loader that prints a Character ‘A’

Code(second.asm):

```
[BITS 16]
[ORG 0x7C00]
MOV AL, 65
CALL PrintCharacter
JMP $

PrintCharacter:
MOV AH, 0x0E
MOV BH, 0x00
MOV BL, 0x07
```

INT 0x10

RET

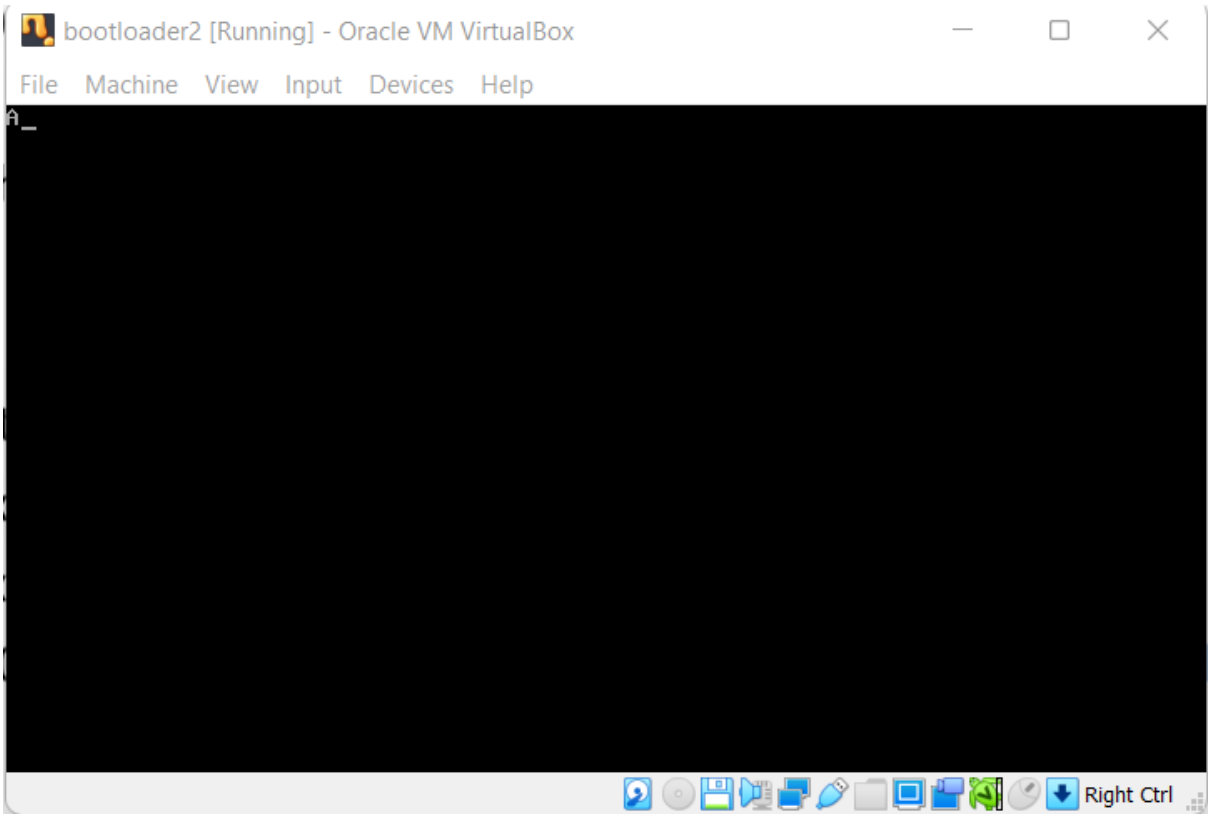
TIMES 510 - ($ - $$) db 0

DW 0xAA55

Compiling and creating dot img file:

```
shubhangi@Shubhi:/mnt/e/vit/4thsem/os/lab/linuxpractice/20bce1161/lab2_bootloader$ nasm second.asm -f bin -o boot2.bin
shubhangi@Shubhi:/mnt/e/vit/4thsem/os/lab/linuxpractice/20bce1161/lab2_bootloader$ dd if=boot2.bin bs=512 of=floppy2.img
1+0 records in
1+0 records out
512 bytes copied, 0.0107499 s, 47.6 kB/s
```

Output:



Program 3. Boot loader that prints “Hello World”:

Code(third.asm):

```
[BITS 16]
[ORG 0x7C00]
MOV SI, HelloString
CALL PrintString
JMP $

PrintCharacter:
MOV AH, 0x0E
MOV BH, 0x00
MOV BL, 0x07
INT 0x10
RET

PrintString:
next_character:
MOV AL, [SI]
INC SI
OR AL, AL
JZ exit_function
CALL PrintCharacter
JMP next_character
exit_function:
RET

HelloString db '20bce1161 Shubhangi Agrawal'', 0
TIMES 510 - ($ - $$) db 0
DW 0xAA55
```

```
shubhangi@Shubhi:/mnt/e/vit/4thsem/os/lab/linuxpractice/20bce1161/lab2_bootloader$ nasm third.asm -f bin -o boot3.bin
shubhangi@Shubhi:/mnt/e/vit/4thsem/os/lab/linuxpractice/20bce1161/lab2_bootloader$ dd if=boot3.bin bs=512 of=floppy3.img
1+0 records in
1+0 records out
512 bytes copied, 0.00809493 s, 63.2 kB/s
```

Output: