

CSC 369 Worksheet 8 Solution

August 25, 2020

1. I need to translate the addresses in the following sets of parameters

- `./segmentation.py -a 128 -p 512 -b 0 -l 20 -B 512 -L 20 -s 0`
- `./segmentation.py -a 128 -p 512 -b 0 -l 20 -B 512 -L 20 -s 1`
- `./segmentation.py -a 128 -p 512 -b 0 -l 20 -B 512 -L 20 -s 2`

Running each command results as follows, with the following sets of valid and invalid addresses

- `./segmentation.py -a 128 -p 512 -b 0 -l 20 -B 512 -L 20 -s 0`

```
moegu@MacBook-Pro-5 worksheet_8 % ./segmentation.py -a 128 -p 512 -b 0 -l 20 -B 512 -L 20 -s 0
ARG seed 0
ARG address space size 128
ARG phys mem size 512

Segment register information:

Segment 0 base (grows positive) : 0x00000000 (decimal 0)
Segment 0 limit                  : 20

Segment 1 base (grows negative) : 0x00000200 (decimal 512)
Segment 1 limit                  : 20

Virtual Address Trace
VA 0: 0x0000006c (decimal: 108) --> PA or segmentation violation?
VA 1: 0x00000061 (decimal: 97)  --> PA or segmentation violation?
VA 2: 0x00000035 (decimal: 53)  --> PA or segmentation violation?
VA 3: 0x00000021 (decimal: 33)  --> PA or segmentation violation?
VA 4: 0x00000041 (decimal: 65)  --> PA or segmentation violation?
```

- VA 0: 0x0000006c (decimal: 108) →
- VA 1: 0x00000061 (decimal: 97) →
- VA 2: 0x00000035 (decimal: 53) →
- VA 3: 0x00000021 (decimal: 33) →
- VA 4: 0x00000041 (decimal: 65) →

- `./segmentation.py -a 128 -p 512 -b 0 -l 20 -B 512 -L 20 -s 1`

- `./segmentation.py -a 128 -p 512 -b 0 -l 20 -B 512 -L 20 -s 2`

Notes

- **Segmentation**

- **Segment** is a contiguous portion of the address space of a particular length
- Is about the big chunk of space in the middle

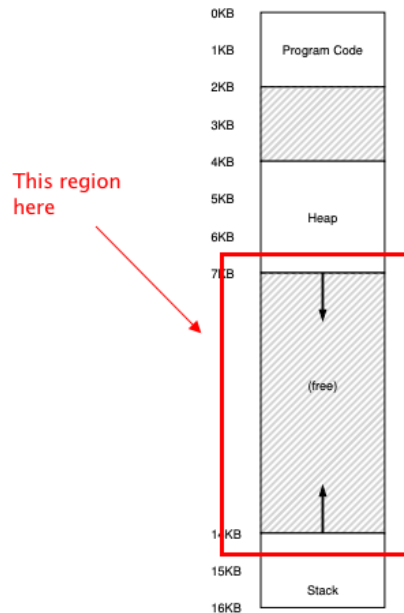


Figure 16.1: An Address Space (Again)

- **Segmentation** allows the OS to place each one of the logical segments (i.e. stack, heap, program code) in different parts of physical memory, and avoid filling physical memory with unused virtual address space

