Homework week 4

Q2. How much memory is in your system? How much is free? Do these numbers match your intuition?

I run the command on WSL Ubuntu

```
zack@DESKTOP-73TH9VQ:~$ free -m
            total        used        free      shared  buff/cache   available
Mem:        15913         583       14587           0         742       15066
Swap:        4096           0        4096
```

16G in total, at least 15G is free.

I do know I have 2 16G RAM, so 16G in total is **OUT OF EXPECTATION**. But I think it is reasonable, cause it is a virtual machine running on my hardware.

Q4. How do the memory usage totals change when your program is running?

To test it, I opened two Ubuntu terminals. Once I start running the program in one terminal and set 500 MB, the other terminal shows the available MB minus 2.

And later, I tried with different memory usage (1, 5, 10, 50, 100, 300, 500), it shows the same result:
on the other terminal, the available memory decreases by 2MB.

I have no idea what WSL had done, but I think perhaps OS detected the action of my code and OS did some optimization

How about when you kill the memory-user program?

On the other terminal, the available memory adds 2 MB.

Do the numbers match your expectations?

Obviously not, haha.

Try this for different amounts of memory usage. What happens when you use really large amounts of memory?

It crushes, the program terminates without any hint and does not give the error message that I write in the code.

Q7. What do you see?

A list of parameters related to address and memory.

How many different entities make up a modern address space, as opposed to our simple conception of code/stack/heap?

Perhaps around 20 or more, as shown in pmap -X PID.

Q8. Finally, let's run pmap on your memory-user program, with different amounts of used memory. What do you see here?

Between two consecutive runs with 1 mb and 1000 mb, there is no difference in the information shown after running pmap. No matter whether is a concise version using -x or a detailed version using -X.

Does the output from pmap match your expectations?

I would say it does not, haha