Lab 2

Main Goals

- Develop Assembly programs:
  - Print a string on the screen
  - Spawn a new shell using execve

- Get familiar with two techniques: relative addressing and pushing data into the stack.

- To get familiar with one technique to build a *working* shellcode (more details next lab).

Activity 1: Print on Screen

- Startup code is provided for `print_rel.asm` and `print_stk.asm`
- You need to:
  - Complete the missing parts
  - Answer few questions about the program

Activity 1: Relative Addressing

```
_start:
        ??            ; (complete)
shellcode:
        ??         ; (complete)
        mov eax, ??   ; (complete)opcode for write system call
        mov ebx, ??   ; (complete) 1st arg is the fd
        mov ecx, ??   ; (complete) 2nd arg is the str address
        mov edx, 15   ; 3rd arg is len
        int 0x80      ; system call interrupt

        mov eax, 1    ; opcode for exit system call
        mov ebx, 0    ; 1st arg, exit(0)
        int 0x80      ; system call interrupt
 saveme:
        ??            ; (complete)
        msg db "Hello, world!", 0xA, 0xD
```

Activity 2: Spawn a new Shell

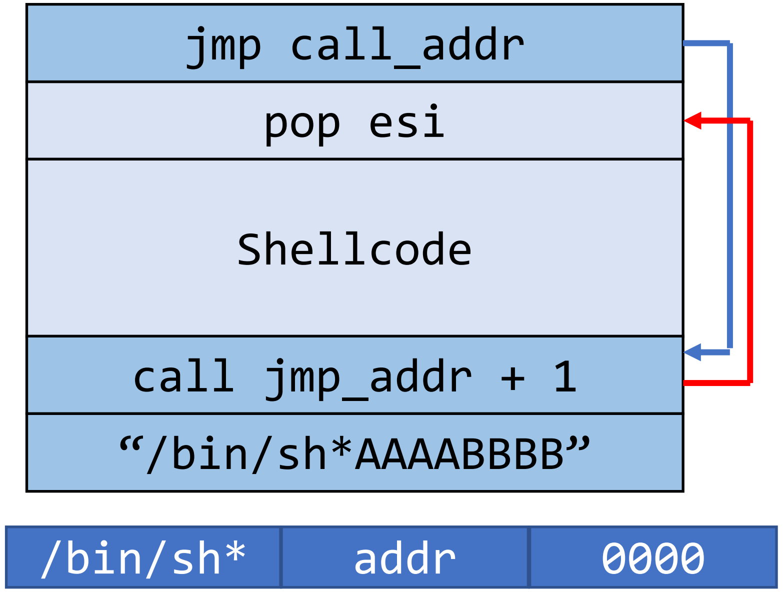
- A *working* startup code is provided that pushes data on stack, you need to:
  - Provide arguments to the spawned shell
  - Provide environment variables to the spawned shell

Activity 2: Spawn a new Shell

- A startup code is provided that uses relative addressing, you need to:
  - Complete the missing parts
  - Answer few questions

- You need to replace:
  - * with a NULL byte
  - AAAA with the address of the address of string
  - BBBB with NULL bytes
  - Why cannot we start with /bin/sh0AAAA0000?

- Can a program modify the code segment?
  - How can we solve this issue?



- mov [ebx+7], 0x00

/bin/sh*	addr	0000

Questions?