

## CS 221 -- Lab 9 String Manipulations

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For this lab exercise, you will need the file **STRINGS.ASM**, create the corresponding executable file.

Create a folder for **Lab9** and copy all the given files.

To assemble the program STRINGS.ASM using the Borland Turbo Assembler enter at the command prompt:

**assemble STRINGS**

To link the program using the Borland Turbo Linker:

**link STRINGS**

Now open up turbo debugger **td STRINGS**

You will mostly be using the **Data tab** to inspect address locations and contents of variables.

You can check the contents by going to the variables window as well.

**Trace** the program to instruction **mov si, offset v1**, determine the locations of the structure StrBuffer buffer data items used to save the echoed message.

(go to variables and look for the STRBuffer struct declared as buffer- i.e. look for variable **buffer**)

You can access the member variables of the struct by typing buffer.maxLen, etc.

maxLen is located at 02BA and contains 128;

strLen is located at 02BB and contains 5 (I entered "HELLO")

chars is located at 02BC and contains 72 ('H's decimal value is 72)

**Trace** the program to the instruction **mov di, offset buff**, determine the locations of

strings v1 00BD and v2 00D2

and their contents v1 = '12345678901234567890'

v2 = '12345678901234567890'

What happened here? 20 items from V1[0] to V1[19] were copied to V2[0] to V2[19]

**Trace** the program to instruction **mov di, offset str1**, determine the location of buff 00FA,

what happened to the string stored at buff? buff[0] is null character now (null string).

**Trace** the program to instruction **mov di, offset lc**,

determine the location of **str1** 014B

what is its length 27 and what register is the value found in? CX

**Trace** the program to instruction **mov di, offset str3**,

determine the location of the **lc** string 0178

and what is its current content? 'ABCDEFGHIJKLMN O PQRSTUVWXYZ'

**Trace** the program to instruction **mov si, offset source**, determine the location of the

**str3** string 0192

and give the before and after values of the string **str3**.

before 'Lions and tigers and bears, oh my!'

after 'Lions and bears, oh my!'

What happened here? 11 chars were deleted starting from str3[6] position.

**Trace** the program to instruction **mov si, offset source1**, determine the locations of strings

**source** 01FF and **dest** 01B5

and give before and after values of the **dest** string.

before: 'Insert into slot-B

after: 'Insert tab-A into slot-B

What happened here? string 'source' was inserted into string 'dest' at dest[7].

**Trace** the program to instruction **mov si, offset str4**, determine the locations of strings

**source1** 0206 and **dest1** 020F

and give the before and after values of the changed string **dest1**

before: 'This is

after: 'This is the end!'

What happened here? String 'Source' was added to the end of string 'dest1'.

**Trace** the program to instruction **mov si, offset ext**, determine the locations of strings

str4 0227 and str5 0237

and give the before and after values of the changed string **str5**

before: NULL characters

after: 'Original string'

What happened here? values of string 'str4' were copied into string 'str5'.

**Trace** the program to instruction **mov si, offset areaCode**, determine the locations of strings

ext 0287 and filename 028C

and what position is ext in the string filename? filename[6]

**Trace** the program **until after** the instruction call StrRemove is executed,

determine the locations of the strings **areaCode** 02B3

and **phoneNumber** 02A4.

Give the before and after values of the modified string.

before: '(800)-555-1212'

after: '555-1212'

What happened here? String 'areaCode' was removed from string 'phoneNumber'.