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Task 1 - Using the String Reverse program as a starting point (c:\Irvine\Examples\Lib32 folder). Modify the program so the user can input a string containing between 1 and 20 characters and then display on the console in the reversed order. Write the complete code by following the following instructions. [10 points]

1. Copy the C:/Irvine/ch05/32 bit/RevStr.asm to your project solution. Run the program to check if it assembles.

2. Under the data directive, declare an array of 20 bytes, initialized to 0, and name it myString. This is to get the string from the user instead of using aName. Also, declare an uninitialized 32-bit unsigned named byteCount. byteCount will hold the number of characters typed by the user.

3. Under main proc before other lines of code, Call Readstring from irvine32.inc to read user input. The ReadString procedure reads a string from the keyboard, stopping when the user presses the Enter key. Pass the offset of a buffer in EDX and set ECX to the maximum number of characters the user can enter, plus 1 (for the terminating null byte). The procedure returns the count of the number of characters typed by the user in EAX. - Read the string to edx, and move the number of bytes entered to byteCount ; need to set edx and ecx first ; then call Readstring ; move eax (number of characters) to byteCount

4. Change all aName variable to myString in the code. Change nameSize to byteCount as well.

5. Write the output using WriteString procedure from irvine32.inc library. Call the WriteString procedure should be made after the string is reversed. The WriteString procedure writes a null-terminated string to the console window. Pass the string's offset in EDX.

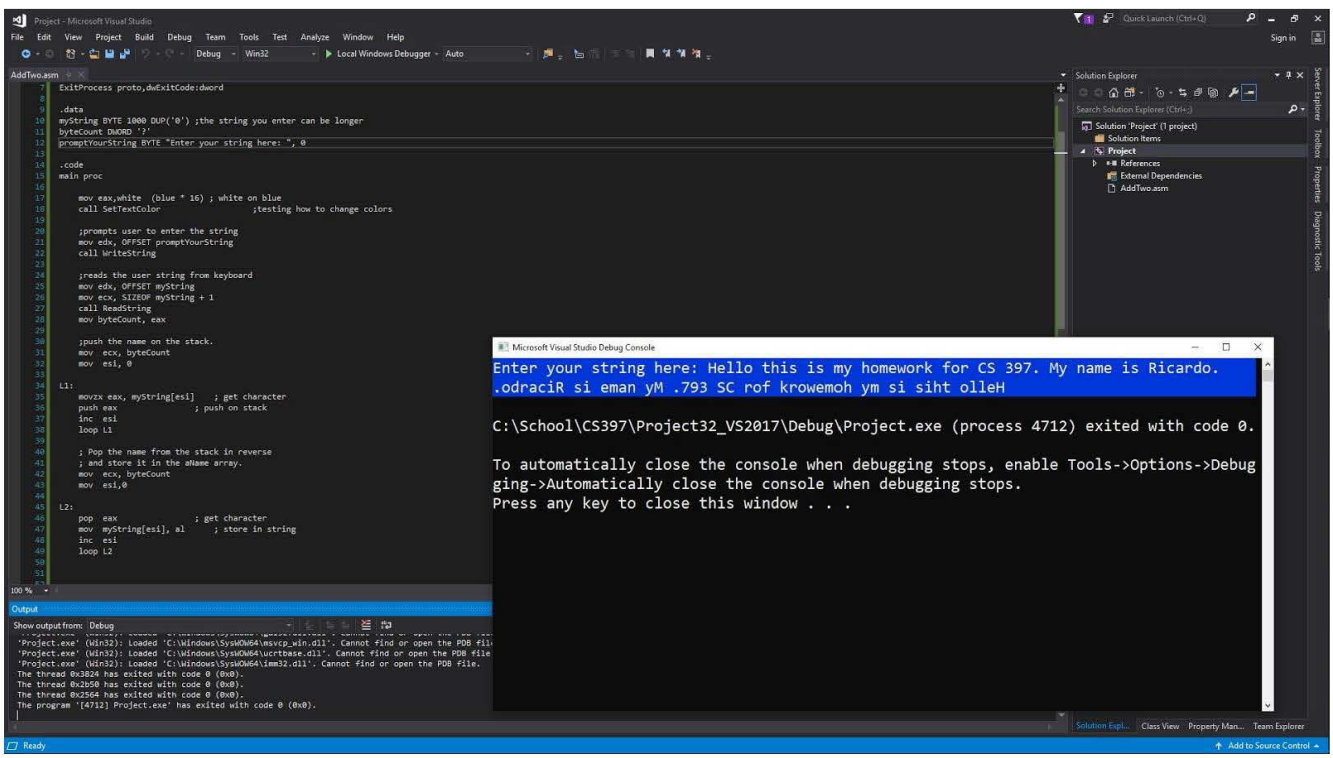
6. Modify the code so that there will be a message prompt "Enter your string here" before the user input the string.

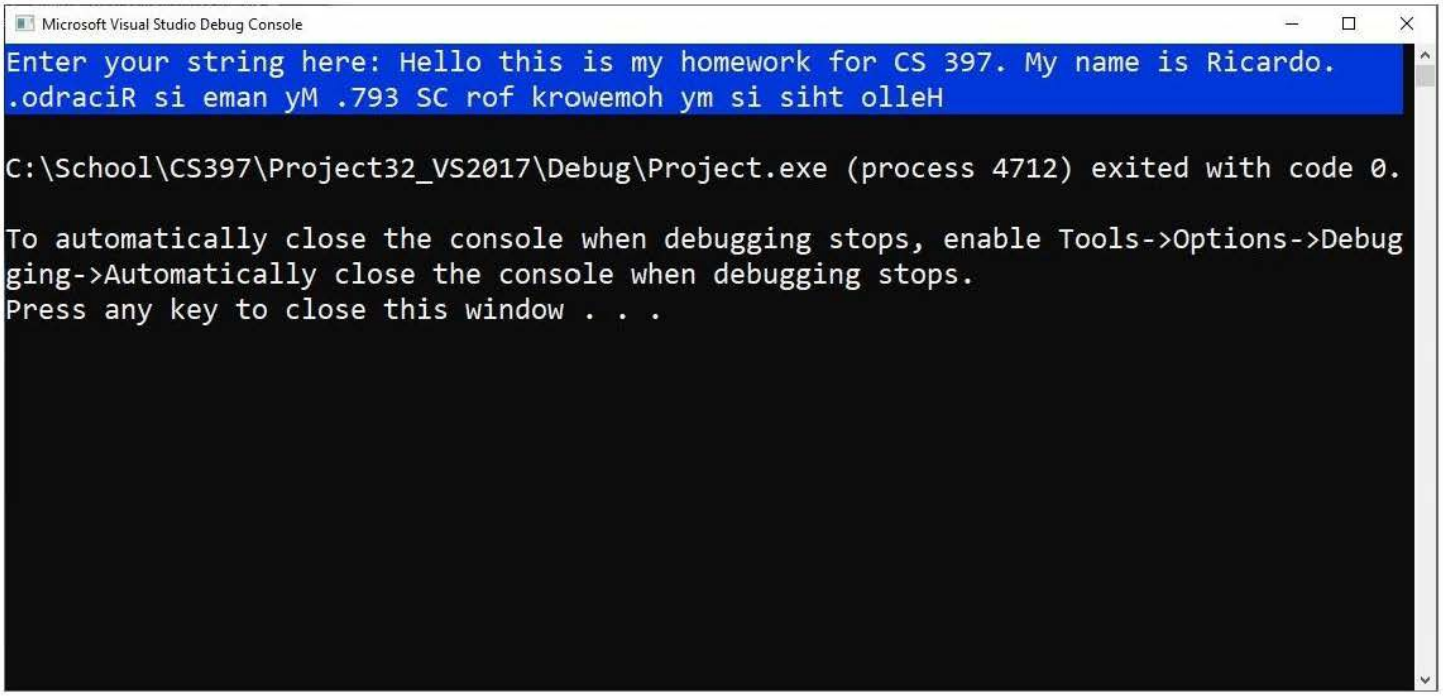
Submit the complete code for the above tasks.

Answer:

```
; Reversing a String (RevStr.asm)
; This program reverses a string.
INCLUDE Irvine32.inc
.386
.model flat,stdcall
.stack 4096
ExitProcess proto,dwExitCode:dword

.data
myString BYTE 1000 DUP('0') ;the string you enter can be longer
byteCount DWORD '?'
promptYourString BYTE "Enter your string here: ", 0

.code
main proc

	mov eax,white  (blue * 16) ; white on blue
	call SetTextColor                                    ;testing how to change colors

	;prompts user to enter the string
	mov edx, OFFSET promptYourString
	call WriteString

	;reads the user string from keyboard
	mov edx, OFFSET myString
	mov ecx, SIZEOF myString + 1
	call ReadString
	mov byteCount, eax

	;push the name on the stack.
	mov	ecx, byteCount
	mov	esi, 0

L1:
	movzx eax, myString[esi]	; get character
	push eax                                    ; push on stack
	inc	esi
	loop L1
```

```
        ; Pop the name from the stack in reverse
        ; and store it in the aName array.
        mov     ecx, byteCount
        mov     esi,0

L2:
        pop  eax                        ; get character
        mov     myString[esi], al       ; store in string
        inc     esi
        loop L2


        call WriteString

        call Crlf ;displays a newline for aesthetic purposes. Info obtained from page 172 in
textbook.

        mov eax,white (blue * 0) ; white on blue
        call SetTextColor                               ;sets color back to default
        Invoke ExitProcess,0
main endp
end main
```




Microsoft Visual Studio Debug Console
Enter your string here: Hello this is my homework for CS 397. My name is Ricardo.
.odraciR si eman yM .793 SC rof krowemoh ym si siht olleH
C:\School\CS397\Project32_VS2017\Debug\Project.exe (process 4712) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debug
ging->Automatically close the console when debugging stops.
Press any key to close this window . . .

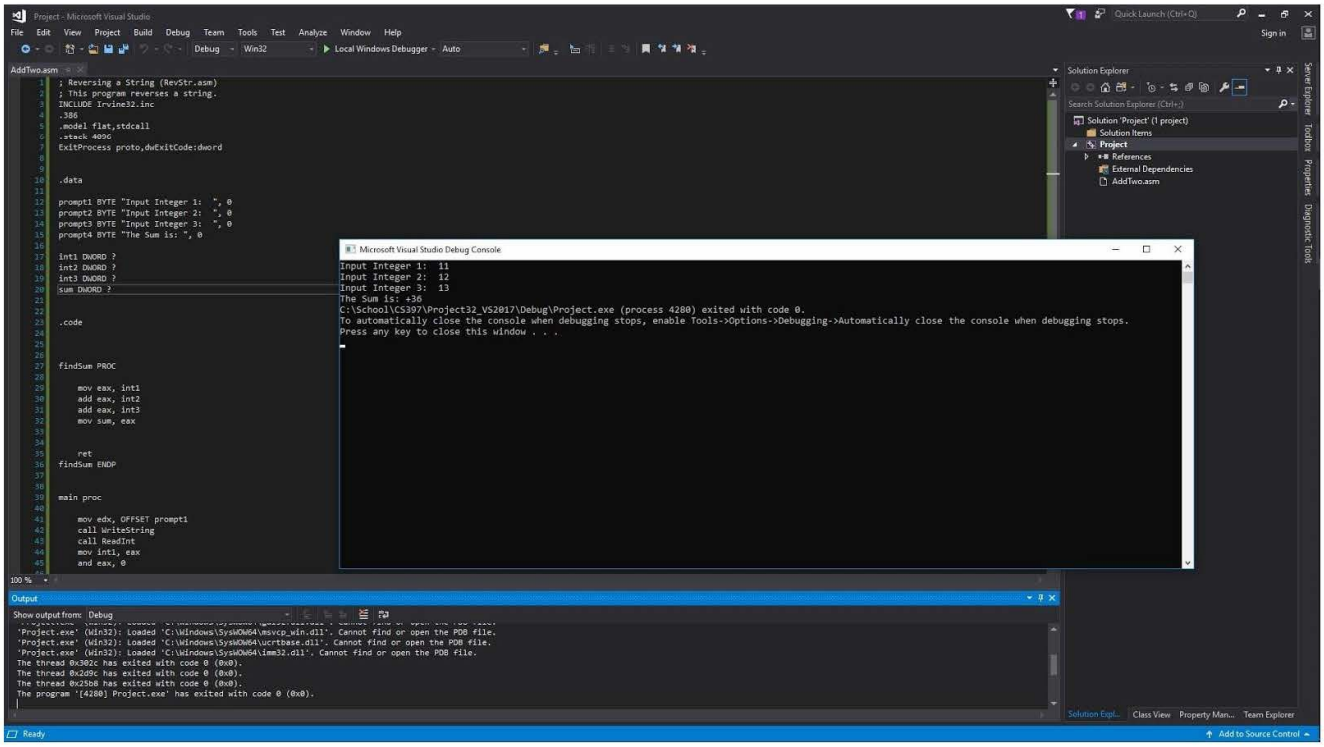
Task2 - Write an assembly program that prompts the user for three integers, adds the integers and display their sum of the three integers. Also, show a screenshot of the output from the MS Visual Studio. [10 points]

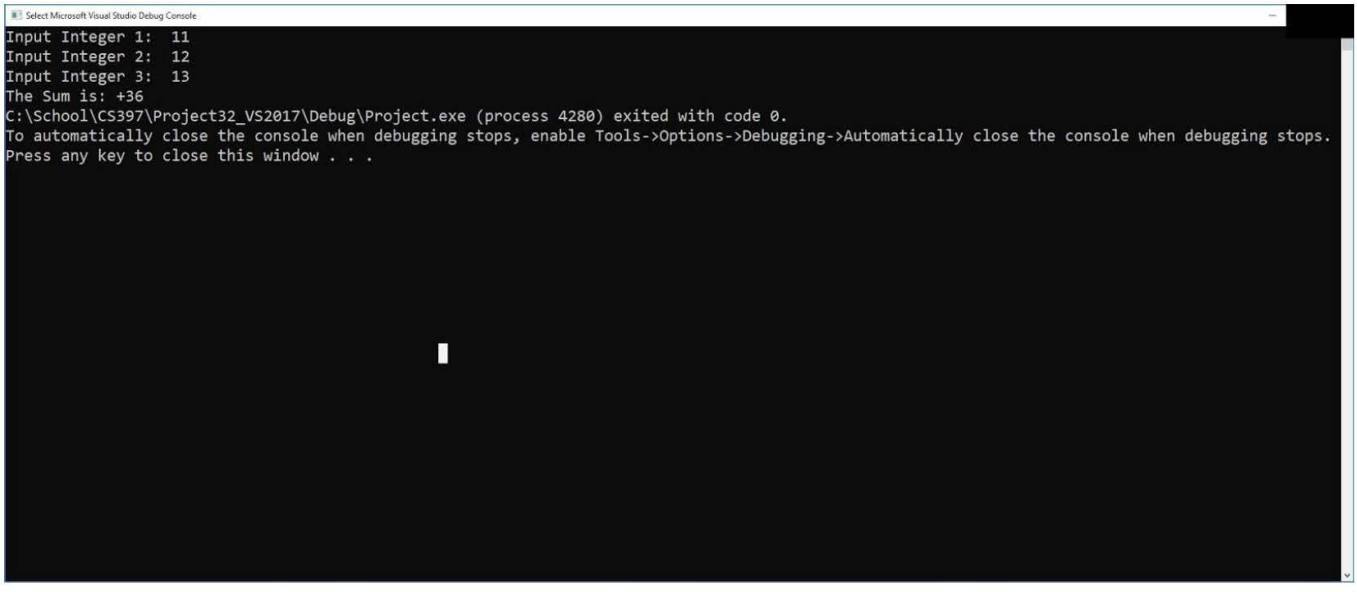
Answer:

```
; Reversing a String (RevStr.asm)
; This program reverses a string.
INCLUDE Irvine32.inc
.386
.model flat,stdcall
.stack 4096
ExitProcess proto,dwExitCode:dword


.data

prompt1 BYTE "Input Integer 1:  ", 0
prompt2 BYTE "Input Integer 2:  ", 0
prompt3 BYTE "Input Integer 3:  ", 0
prompt4 BYTE "The Sum is: ", 0

int1 DWORD ?
int2 DWORD ?
int3 DWORD ?
sum DWORD ?


.code



findSum PROC

        mov eax, int1
        add eax, int2
        add eax, int3
        mov sum, eax
```

```
        ret
findSum ENDP


main proc

        mov edx, OFFSET prompt1
        call WriteString
        call ReadInt
        mov int1, eax
        and eax, 0


        mov edx, OFFSET prompt2
        call WriteString
        call ReadInt
        mov int2, eax
        and eax, 0


        mov edx, OFFSET prompt3
        call WriteString
        call ReadInt
        mov int3, eax
        and eax, 0

        call findSum

        mov edx, OFFSET prompt4
        call WriteString

        mov eax, sum
        call WriteInt



        Invoke ExitProcess,0
main endp
```

end main


Project - Microsoft Visual Studio
AddTwo.asm
; Reversing a String (RevStr.asm)
; This program reverses a string.
INCLUDE Irvine32.inc
.386
.model flat,stdcall
.stack 4096
ExitProcess proto,dwExitCode:dword
.data
prompt1 BYTE "Input Integer 1: ", 0
prompt2 BYTE "Input Integer 2: ", 0
prompt3 BYTE "Input Integer 3: ", 0
prompt4 BYTE "The Sum is: ", 0
int1 DWORD ?
int2 DWORD ?
int3 DWORD ?
sum DWORD ?
.code
findSum PROC
mov eax, int1
add eax, int2
add eax, int3
mov sum, eax
ret
findSum ENDP
main proc
mov edx, OFFSET prompt1
call WriteString
call ReadInt
mov int1, eax
and eax, 0
Microsoft Visual Studio Debug Console
Input Integer 1: 11
Input Integer 2: 12
Input Integer 3: 13
The Sum is: +36
C:\School\CS397\Project32_VS2017\Debug\Project.exe (process 4280) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
Output
Show output from: Debug
'Project.exe' (Win32): Loaded 'C:\Windows\SysWOW64\msvcp_win.dll'. Cannot find or open the PDB file.
'Project.exe' (Win32): Loaded 'C:\Windows\SysWOW64\ucrtbase.dll'. Cannot find or open the PDB file.
'Project.exe' (Win32): Loaded 'C:\Windows\SysWOW64\imm32.dll'. Cannot find or open the PDB file.
The thread 0x302c has exited with code 0 (0x0).
The thread 0x2d9c has exited with code 0 (0x0).
The thread 0x25b8 has exited with code 0 (0x0).
The program '[4280] Project.exe' has exited with code 0 (0x0).
Solution Explorer
Solution 'Project' (1 project)
Solution Items
Project
References
External Dependencies
AddTwo.asm
Ready
Add to Source Control


Select Microsoft Visual Studio Debug Console
Input Integer 1: 11
Input Integer 2: 12
Input Integer 3: 13
The Sum is: +36
C:\School\CS397\Project32_VS2017\Debug\Project.exe (process 4280) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

Task3 - Write an assembly program that prompts the user for a string, if the input strings are lower case character convert the string to all uppercase characters and display it on the screen. Also, show a screenshot of the output from the MS Visual Studio. [10 points]

```
INCLUDE Irvine32.inc
.386
.model flat,stdcall
.stack 4096
ExitProcess proto,dwExitCode:dword


.data
buffer BYTE 1000 DUP('0')
byteCount DWORD ?
prompt1 BYTE "Input a string: ", 0
prompt2 BYTE "Uppercase string: ", 0
myString DWORD ?


.code
main proc

        mov edx, OFFSET prompt1
        call WriteString                        ; prompt: ask user to input a string

        mov edx, OFFSET buffer                  ; you input ur string in this part
        mov ecx, SIZEOF buffer
        call ReadString
        mov byteCount, eax


        mov edx, OFFSET prompt2
        call WriteString                        ; prompt: setting up to display the
user's string in uppercase form.
```

```
        INVOKE Str_ucase, ADDR buffer                ;Information obtained from page 363. This
basically converts a string to all uppercase characters.
        mov edx, OFFSET buffer
        call WriteString


        invoke ExitProcess,0
main endp
end main
```