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Taks1: write a complete assembly program to check if the value in an array is divisible by 10.
The program should count the number of values that is divisible by 10. Use stack parameters!

```
.data
MyOne WORD 1100h, 2202h, 3F30h, 4A05h, 5C20h, 0F370h, 0A9Ah
```

Answer:

```
; Program to check if the value in an array is divisible by 10
; Program should count the number of values that is divisible by 10.
```

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

```
.data
MyOne WORD 1100h, 2202h, 3F30h, 4A05h, 5C20h, 0F370h, 0A9Ah
prompt BYTE "The number of values divisible by 10 in MyOne is: ", 0
DivisibleCounter DWORD ?
```

```
.code
```

```
main proc
```

```
    mov eax, 0 ;clear eax register
    mov ecx, LENGTHOF MyOne ;set loop counter to how many values are in MyOne
    mov esi, 0 ; sets esi to 0 so the first digit pushed will be 1100h
```

L1:

```
    push MyOne[esi]    ;pushes first digit on to stack.
    add esi, 2         ;increments esi to next value in MyOne because word (2).
    loop L1;loops until the last value 0A9AH is on the top of the stack
```

```
mov ebx, 0 ;clears ebx register. This will be used as the divisor counter
mov ecx, LENGTHOF MyOne ;sets loop counter to how many values in MyOne
mov esi, 0
```

L2:

```
mov edx,0 ;clears edx register because when you divide the remainder is stored in
```

DX

```
pop ax ;pops the first value on stack into EAX.
mov ebx, 0Ah
div ebx
```

```
cmp dx,0
```

```
jne next
```

```
inc esi ; this register is used to count how many values are divisible by 10.
```

next:

```
loop L2
```

```
mov DivisibleCounter, esi ; this moves the number of values divisible by 10 into an
variable called DivisibleCounter
```

```
mov edx, OFFSET prompt ; this outputs the prompt in windows console. The number of
values divisible by 10 in MyOne is:
```

```
call WriteString
```

```
mov eax, DivisibleCounter ;This moves the number of values divisible by 10 into EAX
```

```
call WriteDec ;This writes the value in eax(number of values divisible by 10 in MyOne)
into the windows console.
```

```
call CrLf ;line break
```

```
call CrLf ;line break
```

```
Invoke ExitProcess,0
```

```
main endp
```

```
end main
```

Side Note: Sorry when I was compiling my answers into a text editor (Google Docs) I noticed some of my code I wrote in Visual Studio went onto the next line . Here is how my code looks like without line breaks....

Line 1-40

```
D:\subzero_flow\Desktop\School\CS 397\Extra Credit Assignment.asm - Sublime Text (LICENSE UPGRADE REQUIRED)
File Edit Selection Find View Goto Tools Project Preferences Help

Extra Credit Assignment.asm x
1 ; Program to check if the value in an array is divisible by 10
2 ; Program should count the number of values that is divisible by 10.
3
4 INCLUDE Irvine32.inc
5 .386
6 .model flat,stdcall
7 .stack 4096
8 ExitProcess proto,dwExitCode:dword
9
10 .data
11 MyOne WORD 1100h, 2202h, 3F30h, 4A05h, 5C20h, 0F370h, 0A9Ah
12 prompt BYTE "The number of values divisible by 10 in MyOne is: ", 0
13 DivisibleCounter DWORD ?
14
15 .code
16 main proc
17
18     mov eax, 0 ;clear eax register
19     mov ecx, LENGTHOF MyOne ;set loop counter to how many values are in MyOne
20     mov esi, 0 ; sets esi to 0 so the first digit pushed will be 1100h
21
22 L1:
23     push MyOne[esi] ;pushes first digit on to stack.
24     add esi, 2 ;increments esi to next value in MyOne because word (2).
25     loop L1 ;loops until the last value 0A9AH is on the top of the stack
26
27
28     mov ebx, 0 ;clears ebx register. This will be used as the divisor counter
29     mov ecx, LENGTHOF MyOne ;sets loop counter to how many valeus in MyOne
30     mov esi, 0
31
32 L2:
33     mov edx,0 ;clears edx register because when you divide the remainder is stored in DX
34     pop ax ;pops the first value on stack into EAX.
35     mov ebx, 0Ah
36     div ebx
37
38
39     cmp dx,0
40     jne next
41     inc esi ; this register is used to count how many values are divisible by 10.
```

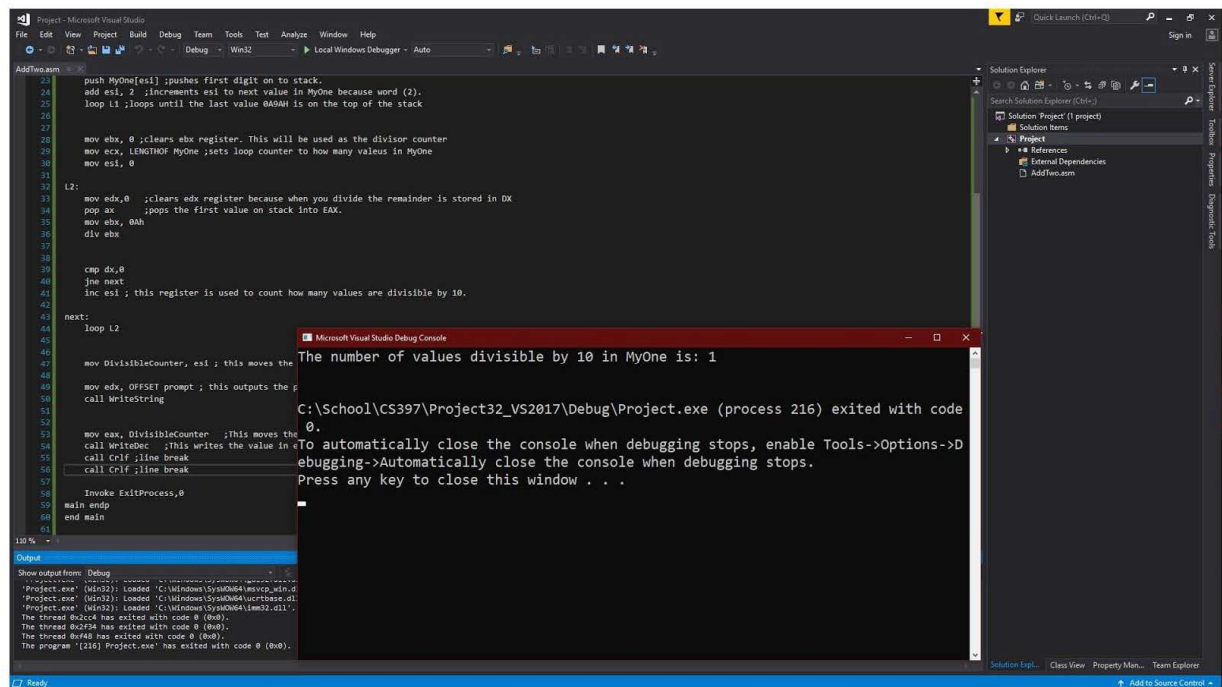
Line 38-61

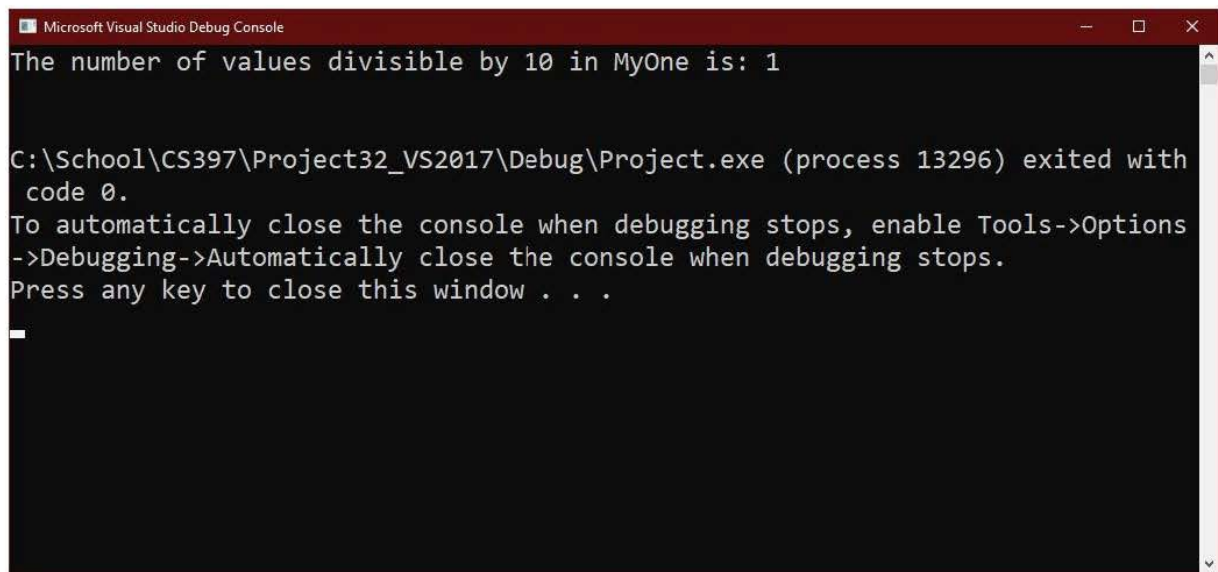
```

37
38
39     cmp dx,0
40     jne next
41     inc esi ; this register is used to count how many values are divisible by 10.
42
43 next:
44     loop L2
45
46
47     mov DivisibleCounter, esi ; this moves the number of values divisible by 10 into an varible called DivisibleCounter
48
49     mov edx, OFFSET prompt ; this outputs the prompt in windows console. The number of values divisible by 10 in MyOne is:
50     call WriteString
51
52
53     mov eax, DivisibleCounter ;This moves the number of values divisible by 10 into EAX
54     call WriteDec ;This writes the value in eax(number of values divisible by 10 in MyOne) into the windows console.
55     call CrLf ;line break
56     call CrLf ;line break
57
58     Invoke ExitProcess,0
59 main endp
60 end main
61

```

Proof code works:





```
Microsoft Visual Studio Debug Console
The number of values divisible by 10 in MyOne is: 1

C:\School\CS397\Project32_VS2017\Debug\Project.exe (process 13296) 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 . . .
```

Taks2: In your opinion, what are the benefits of learning assembly language? Write a short paragraph to explain.

Response:

Some of the reasons why one should learn assembly language is that it is still a popular programming language that is still used today. Personally I did not know how binary codes works and what binary values like 1010 mean until I took this class. I am glad that I took this course because now I know what those numbers mean. I have seen a bunch of 0s and 1s in movies that represent how computer programmers are. Once I took this course I finally understood what they mean and how to work with binary numbers.

Along with learning somet topics taught in this class, I learned more than I knew before about computers. Before I had no idea how the CPU and memory worked. Now I am more familiar of those hardware. Using the Microsoft Visual studio was the best part of this class to me. Usually when I took a programming language course or any CS course in York College, I would never get to learn the coding process like professor Thitima taught us. I really appreciate her teaching us some parts of Visual studios because now I am more familiar with it.

Learning assembly language is manageable at some points for me. Whenever I got an assignment, I would start by using the textbook. Before this course I would never look at the textbook for any class or for any reason. I started to look at the textbook because the textbook Assembly Language for x86 processors 7th edition is an amazing book. It is well written and anyone can understand it. Learning assembly language has taught me how a computer operates when you request something or do a simple task. The information that I learned was very helpful for my computer science major.