Part 1 Reverse an array: https://youtu.be/2wtjndyW8go
Part 2 Reverse a string: https://youtu.be/M7Fy9hCK9t0
Part 3 Shift elements in array: https://youtu.be/7CT2dOmEQlQ

```
; Program Template (labw14p1.asm)
; Program Description: Reverse an array of integers
 ; Author: Timothy Bryant
 ; Creation Date: 4/24/2021
 ; Revisions:
 ; Date:
 ; Modified by:
  .386
.model flat,stdcall
.stack 4096
ExitProcess PROTO, dwExitCode:DWORD
INCLUDE Irvine32.inc

.data
; declare variables here

dArray DWORD 1, 2, 3, 4, 5, 6, 7, 8

.code
main PROC
;write your code here

;get the addresses of the array
mov esi, OFFSET dArray
mov edi, OFFSET dArray

;add  the array and the number of bytes used by array
add edi, SIZEOF dArray

;subtract the array by the size of each element the array
sub edi, TYPE dArray

;counter for loop
mov ecx, LENGTHOF dArray

;loop
restart:
            ;move the elements of the array in registers
            mov eax, [esi]
            mov ebx, [edi]

            ;swap the contents of the registers
            xchg eax, ebx

            ;move the swapped elements back in the array
            mov [esi], eax
            mov [edi], ebx

            ;move on to the next element in the array
            add esi, TYPE dArray

            ;move backwards in the array
            sub edi, TYPE dArray
```

```
                ;decrement ecx-has length of array
                dec ecx

  loop restart

  ;get address for the array
  mov esi, OFFSET dArray

  ;counter
  mov ecx, LENGTHOF dArray

  print:
                ;move element into eax
                mov eax, [esi]

                ;display element
                call WriteDec

                ;move onto the next element
                add esi, TYPE dArray


  loop print

  call DumpRegs

  INVOKE ExitProcess, 0
  main ENDP
  ; (insert additional procedures here)
  END main
```



```
87654321
  EAX=00000001   EBX=00000004   ECX=00000000   EDX=000210AA
  ESI=00026020   EDI=0002600C   EBP=00AFFB94   ESP=00AFFB88
  EIP=0002369E   EFL=00000212   CF=0  SF=0  ZF=0  OF=0  AF=1  PF=0


C:\Users\jakeb\source\repos\Project2\Debug\Project2.exe (process 1472) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```

```
; Program Template (labw14p2.asm)
; Program Description: Reverse the order of string
 ; Author: Timothy Bryant
 ; Creation Date: 4/25/2021
 ; Revisions:
 ; Date:
 ; Modified by:
  .386
 .model flat,stdcall
 .stack 4096
 ExitProcess PROTO, dwExitCode:DWORD
 INCLUDE Irvine32.inc

 .data
 ; declare variables here

 source BYTE "This is the source string", 0
```

```asm
target BYTE SIZEOF source DUP('#')

.code
main PROC
;write your code here

;move 0 into register to start at the begining of the string
mov esi, 0

;move the length of string minus 1 to start at end of the string
mov edi, SIZEOF source - TYPE source

;move size of string for loop in register
mov ecx, LENGTHOF source + 24

;loop
restart:

        mov al, source[esi]
        mov target[edi], al

        ;move on to the next element in the array
        inc esi
        dec edi

        ;decrement the size of string
        dec ecx

loop restart

;display string in reverse order
mov edx, OFFSET target
call WriteString


call DumpRegs

INVOKE ExitProcess, 0
main ENDP
; (insert additional procedures here)
END main
```
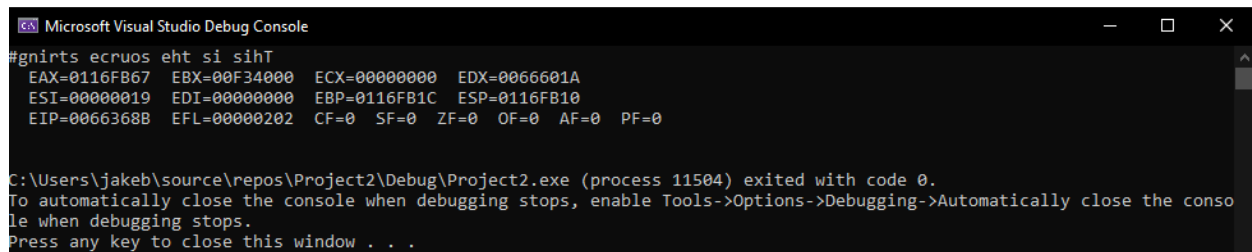


```
#gnirts ecruos eht si sihT
 EAX=0116FB67  EBX=00F34000  ECX=00000000  EDX=0066601A
 ESI=00000019  EDI=00000000  EBP=0116FB1C  ESP=0116FB10
 EIP=0066368B  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0


C:\Users\jakeb\source\repos\Project2\Debug\Project2.exe (process 11504) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```

```asm
; Program Template (labw14p3.asm)
; Program Description: Shift elements in an Array
 ; Author: Timothy Bryant
 ; Creation Date: 4/27/2021
 ; Revisions:
```

```
; Date:
; Modified by:
 .386
.model flat,stdcall
.stack 4096
ExitProcess PROTO, dwExitCode:DWORD
INCLUDE Irvine32.inc

.data
; declare variables here

dArray DWORD 10, 20, 30, 40
newArray DWORD LENGTHOF dArray DUP(?)
lastElement DWORD ?

.code
main PROC
;write your code here

;move the address of the first element
mov esi, OFFSET dArray

;move the address of the second element
mov edi, OFFSET newArray
add edi, TYPE newArray

;loop counter
mov ecx, LENGTHOF dArray - 1

restart:
            ;move the first element into eax
            mov eax, [esi]

            ;move the first element into the second element in edi array
            mov [edi], eax

            ;move onto the next elements
            add esi, TYPE dArray
            add edi, TYPE newArray

loop restart

;set last element in dArray to first in newArray
mov edi, OFFSET newArray
mov eax, [esi]
mov [edi], eax

;get address for first element
mov edi, OFFSET newArray

;set counter for print loop
mov ecx, LENGTHOF newArray

print:
            ;move the first element into eax
            mov eax, [edi]

            ;display the element
```
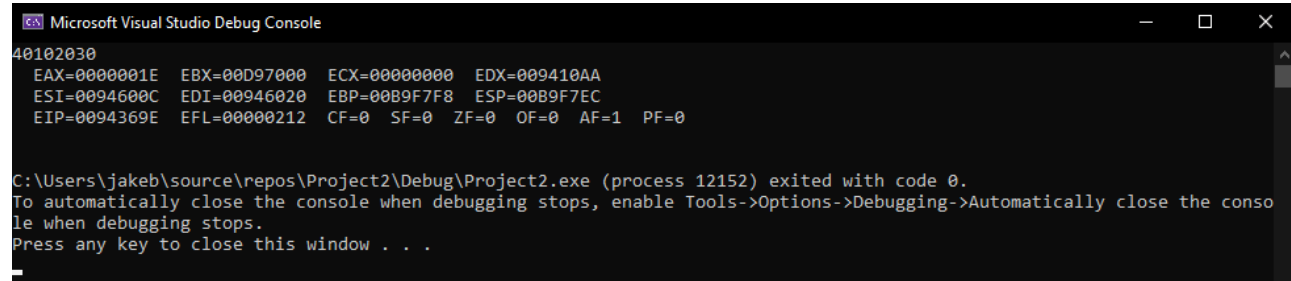
```
        call WriteDec

        ;move onto next element
        add edi, TYPE newArray

loop print

 call DumpRegs

 INVOKE ExitProcess, 0
 main ENDP
 ; (insert additional procedures here)
 END main
```