60-266 – Assignment #3

DUE DATE is: *Friday, March 2, 2018.* To be submitted via Blackboard by Midnight.

WARNINGS: You must only use instructions and directives discussed in Lectures 1 to 8.

Programming Exercise (40 points): [call it Ass3.asm]

1. (10 points) Write a procedure `ArrayToStack` which copies the *N* elements of an array, `Vector`, onto the runtime stack. `Vector` is an array of unsigned double-word integer. Register ESI should initially contain the offset address of `Vector`, and register EBX contains *N*.

2. (10 points) Write a procedure `StackToArray` which copies back to `Vector` the last *N* double-word elements pushed onto the stack (by procedure `ArrayToStack`). Again, EBX contains the number *N*, and ESI initially contains the offset address of Vector. `StackToArray` should not reverse `Vector` (that is, the elements should return to their initial positions as before the execution of `ArrayToStack`).

3. (10 points) Write a procedure `StackReverse` which uses the stack to reverse an array `Vector` of *N* unsigned double-word integers.

4. (20 points) To test these three procedures, your main program should display the following interaction with you (things in reds are your inputs)

```
What do you want to do now? > 0

What is the size N of Vector?> 13
What are the 13 values in Vector?> 1 2 3 4 5 6 7 8 9 10 11 12 13

Size of Vector is N = 13
Vector = 1   2   3   4   5   6   7   8   9   10   11   12   13
Stack is empty

What do you want to do now? > 1

Vector is 1   2   3   4   5   6   7   8   9   10   11   12   13 before ArrayToStack
Stack is 13   12   11   10   9   8   7   6   5   4   3   2   1 after ArrayToStack
Stack not empty

What do you want to do now? > 2

Stack is 13   12   11   10   9   8   7   6   5   4   3   2   1 before StackToArray
Vector is 1   2   3   4   5   6   7   8   9   10   11   12   13 after StackToArray
Stack is empty

What do you want to do now? > 3

Vector is 1   2   3   4   5   6   7   8   9   10   11   12   13 before StackReverse
Stack not empty
```

```
➢  Vector is 13   12   11   10   9   8   7   6   5   4   3   2   1 after StackReverse
➢  Stack is empty
➢
➢  What do you want to do now? > 3
➢
➢  Vector is 13   12   11   10   9   8   7   6   5   4   3   2   1 before StackReverse
➢  Stack not empty
➢  Vector is 1   2   3   4   5   6   7   8   9   10   11   12   13 after StackReverse
➢  Stack is empty
➢
➢  What do you want to do now? > 2
➢  Error - Stack is empty: Cannot perform StackToArray
➢
➢  What do you want to do now? > 0
➢
➢  What is the size N of Vector?> 6
➢  What are the 6 values in Vector?> 8 9 10 11 12 13
➢
➢  Size of Vector is N = 6
➢  Vector = 8   9   10   11   12   13
➢  Stack is empty
➢
➢  What do you want to do now? > 1
➢
➢  Vector is 8   9   10   11   12   13 before ArrayToStack
➢  Stack is 13   12   11   10   9   8  after ArrayToStack
➢  Stack not empty
➢
➢  What do you want to do now? > -1
➢  I am exiting… Thank you Honey… and Get lost…
➢
```