Source File: lab23.asm
Input: None
Output: Standard Output
Value: 2

     Write an assembly language procedure that generates a random string of a given length, containing all capital letters. A description of the function as well as client code for testing your implementation is shown in Figure 1, and a sample execution sequence is shown in Figure 2. To use the `Makefile` as distributed in class, add a target of `lab23` to `targets2AsmFiles`.

```
1   [list -]
2   %INCLUDE "Along32.inc"
3   %INCLUDE "Macros_Along.inc"
4   [list +]
5
6   ;----------------------------------------------------------------------
7   extern GenerateRandomString
8   ; HLL prototype: void GenerateRandomString(char *string, int n);
9   ; This function generates a string of length n, containing all
10  ; capital letters. The random letters are placed in the string
11  ; beginning at the lowest offset.
12  ; Receives: ESI = starting offset of string
13  ;           ECX = length of string
14  ; Returns:  nothing
15  ;----------------------------------------------------------------------
16
17  SECTION .data
18  string  times   50 db '#'
19  size    equ     ($ - string)
20  lit1    db      'string(',0
21  lit2    db      ') = ',0
22  count   dd      1
23
24  SECTION .text
25          global  _start
26  _start:
27          mov     ecx,size-1              ; loop control
28  myLoop:
29          push    ecx                     ; save ecx
30
31          mov     ecx,[count]
32          mov     esi,string
33          call    GenerateRandomString
34
35          add     esi,[count]
36          mov     byte [esi],0            ; place a null byte at end of string
37
```

Figure 1. /usr/local/3304/src/lab23main.asm (Part 1 of 2)

```
38          mov     edx,lit1                ; print the first literal
39          call    WriteString
40          mov     eax,[count]             ; print count as an unsigned int
41          call    WriteDec
42          mov     edx,lit2                ; print the second literal
43          call    WriteString
44          mov     edx,string
45          call    WriteString             ; print the randomly generated string
46          mov     al,10                   ; write \n to standard output
47          call    WriteChar
48
49          inc     dword [count]
50
51          pop     ecx                     ; return loop control variable to ecx
52          loop    myLoop
53
54          Exit    {0}
```

Figure 1. /usr/local/3304/src/lab23main.asm (Part 2 of 2)

```
1   newuser@csunix ~/3304/23> cp /usr/local/3304/data/23/* .
2   newuser@csunix ~/3304/23> cp /usr/local/3304/src/lab23main.asm .
3   newuser@csunix ~/3304/23> cp /usr/local/3304/src/Makefile .
4   newuser@csunix ~/3304/23> touch lab23.asm
5   newuser@csunix ~/3304/23> make lab23
6   nasm -f elf32  -l lab23main.lst -o lab23main.o lab23main.asm -I/usr/local/3304/include/ -I.
7   nasm -f elf32  -l lab23.lst -o lab23.o lab23.asm -I/usr/local/3304/include/ -I.
8   ld -m elf_i386 --dynamic-linker /lib/ld-linux.so.2 -o lab23 lab23main.o lab23.o \
9   /usr/local/3304/src/Along32.o -lc
10  newuser@csunix ~/3304/23> ./lab23
11  string(1) = U
12  string(2) = SZ
13  string(3) = NJE
14  string(4) = SOFQ
15  string(5) = UPWYL
16  string(6) = FDGEFX
17  string(7) = VQUGKFE
18  string(8) = WDLNJDTQ
19  string(9) = KKEKMEUPD
20  string(10) = GZZOHCFOEO
21  string(11) = ZFZPMHIDBDX
22  string(12) = DOBHUJFHAPTD
23  string(13) = FRDEKJXMAVUHR
24  string(14) = EMMBSQOTBUMMZI
25  string(15) = IOEEKSAQKEQKHQV
26  string(16) = BYRPVTIOTTTJCMEE
27  string(17) = EICUPAEEFLWSZYSKM
28  string(18) = CZRSSIKWBRXHHKQRRY
29  string(19) = KERSVARIAWQKSDXFKTS
30  string(20) = GNTSLGCNCEGHJJDQMHKE
```

Figure 2. Commands to Assemble, Link, & Run Lab 23 (Part 1 of 2)

```
31    string(21) = NPFDQTKGGQHVCZQQEUNAM
32    string(22) = BTERBWUCPDLJJYFVVLUSOS
33    string(23) = CWDVDUOUVHHGXZQVTGGOBRO
34    string(24) = EMFHTZWVRIEECWUTBZLXPLXW
35    string(25) = QBSMVSBARFHOCAADSLSSKCULK
36    string(26) = YHYMCDAEQUWANBQUDFEZWQNXJQ
37    string(27) = ZBDKOFBTEDVDTXZNXHPPPXMZUAJ
38    string(28) = KACUXROGGOXNDRXVNHMTXVGSNHKH
39    string(29) = JNBHCSDDLXPGGAGAXJEGDFLIRONUT
40    string(30) = HLLLHCOUJAXJOKZUFLILRTSCCMPVQV
41    string(31) = RCICWPQZDVZOGPWFRLFWLLQYHSAJFXU
42    string(32) = YOYMTQSEULTXPNBKSSNHREAWHWMTCMPB
43    string(33) = PSOTLJWKMCFMEDVPDZZUOSCQOOYJDCBBK
44    string(34) = ZYDKEOXTZNCHUNRVLJYLFKRHVUTJRBLJEC
45    string(35) = FJKKLAHPMAMFOCCHXEEILIIWGQKOKCQWIGZ
46    string(36) = UVJMZXNFIEJJFHQAOQUAIGBQAKDTQOTCYKAO
47    string(37) = LPEMUUGHBJNPCYDDUCCXCBMFCSOKWSZPZMJAA
48    string(38) = ZLKDEKXSYANLLLWEZKMDRPZKPAIKUXRYROOYWR
49    string(39) = CAJFYLRGGIFBZZTIBVTRGQOAAYRHJGYYRBBEZVS
50    string(40) = LDCYCDJOOMTJHFIHFCMMGMYLHNTJDLZUMJQYPOHI
51    string(41) = PNNGMWEBKHQQUKATOAFUCMPMCGQQADPUATFWFYOVP
52    string(42) = VYRDXMUBHHMTJLHDRZHJLRNFSREWFYAYWTTOCGUDLP
53    string(43) = VTVNXQRBDQOFVWJNTFVCARDXHFESGWOPDYUNFBYZYHW
54    string(44) = LBNNTTEAWNENHAEJCVJUZTXSMSKJPOZBEKCKPUXTBVEC
55    string(45) = FEBTHLINTAWPOIJJXCIEOILMIEKRZTJNBCYQDFXWAATGE
56    string(46) = TGQJPLWGRJHKWMWHMQPFPJTHYAYMUSCEVZIBXUJSTAGSHR
57    string(47) = PBUJYRVDLHEBVINDLQXTVPDVISDBCSDWJDGAWXOYABLSIGN
58    string(48) = GKWEUGIUYMOYEFEBXCLNDVGCZJLHGGWKOGGYDUEGDDKSBOSG
59    string(49) = MCDFYQKCUJTVFVMQJDKWCXAZSVYAESEQZVBQHKGLZYFKQXUSG
60    newuser@csunix ~/3304/23> ./lab23 > my.out
61    newuser@csunix ~/3304/23> diff 01.out my.out
62    newuser@csunix ~/3304/23>
```

Figure 2. Commands to Assemble, Link, & Run Lab 23 (Part 2 of 2)