



20F-0292_BCS 4D_COAL LAB ASSIGNMENT 1

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All Procedures Explanation: -

- 1) Clrscr:- Clears the whole screen on console.
- 2) CrLf:- Also called end line because it moves cursor on next line.
- 3) Delay:- Pause the execution of program for certain amount of milliseconds.
- 4) Dumpmem:- Writes block of memory to a standard output in Hex.
- 5) Dumpregs:- Displays/prints all general purpose register & flags (hex) on console.
- 6) Gotoxy:- Locates cursor at certain row & column on console.
- 7) Random32:- Generates random 32-bit integer in range of 0-FFFFFFFF.
- 8) Randomize:- Seeds random number generator.
- 9) RandomRange:- Generates a pseudorandom integer in a specific range.
- 10) Readchar:- Reads ~~sig~~ single character from an input.
- 11) Readdec:- Reads 32-bit unsigned decimal integer as input from keyboard.
- 12) Readhex:- Reads 32-bit hex integer from keyboard.
- 13) Readint:- Reads 32-bit signed decimal integer from keyboard.
- 14) Writechar:- ~~Writes single~~ Shows single character in output.
- 15) Writedec:- Prints unsigned 32-bit decimal integer.
- 16) Writehex:- Prints unsigned 32-bit hexadecimal integer.
- 17) Writeint:- Prints signed 32-bit decimal integer.
- 18) Writestring:- Prints null-terminated string to console.

Code Implementations: -

Code 1: -

```
INCLUDE Irvine32.inc
.data
arrayD DWORD 1000h,2000h,3000h, 4000h, 5000h
prompt1 BYTE "Enter a 32-bit signed integer: ",0
dwordVal DWORD ?
.code
main PROC
    mov eax , yellow + (blue * 16)
    call SetTextColor
    call Clrscr ; clear the screen
    mov esi , OFFSET arrayD
    mov ecx , LENGTHOF arrayD
    mov ebx , TYPE arrayD
    call DumpMem ; display memory
    call Crlf ; new line
    mov edx , OFFSET prompt1
    call WriteString
    call ReadInt ; input the integer
    mov dwordVal , eax
    call Crlf ; new line
    call WriteInt ; display in signed decimal
    call Crlf
    call WriteHex ; display in hexadecimal
    call Crlf
    call WriteBin ; display in binary
    call Crlf
    call WaitMsg ; "Press any key..."
    call SetTextColor
    call Clrscr
    exit
main ENDP
END main
```

Output: -

```
C:\Users\saadg\source\repos\Assembly_Project5\Debug\Assembly_Project5.exe

Dump of offset 00846000
-----
00001000  00002000  00003000  00004000  00005000

Enter a 32-bit signed integer: +1278

+1278
000004FE
0000 0000 0000 0000 0000 0100 1111 1110
Press any key to continue...
```

```
C:\Users\saadg\source\repos\Assembly_Project5\Debug\Assembly_Project5.exe

Dump of offset 00846000
-----
00001000  00002000  00003000  00004000  00005000

Enter a 32-bit signed integer: -172197

-172197
FFFD5F5B
1111 1111 1111 1101 0101 1111 0101 1011
Press any key to continue...
```

Code 2: -

```
INCLUDE Irvine32.inc
TAB = 9 ; ASCII code for Tab
.data
str1 byte "          PROGRAM FOR RANDOM NUMBER GENERATION",0
.code
main PROC
MOV EDX , OFFSET STR1
CALL WRITESTRING
CALL CRLF
CALL CRLF
call Randomize ; init random generator
call Rand1
CALL CRLF
call Rand2
    exit
main ENDP
Rand1 PROC

mov ecx,10
```

```

L1:
call Random32 ; generate random int
call WriteDec ; write in unsigned decimal
mov al , TAB ; horizontal tab
call WriteChar ; write the tab
loop L1
call CrLf
ret
Rand1 ENDP
Rand2 PROC

mov ecx,10

L1:
mov eax , 100 ; values 0-99
call RandomRange ; generate random int
sub eax,50 ; vaues -50 to +49
call WriteInt ; write signed decimal
mov al , TAB ; horizontal tab
call WriteChar ; write the tab
loop L1
call CrLf
ret
Rand2 ENDP
END main

```

Output: -

```

Microsoft Visual Studio Debug Console
PROGRAM FOR RANDOM NUMBER GENERATION

1024170780      207981694      2677743700      3871546588      301477664      2432454850      331780759      2321664229      635986582      1413042096

+43      -49      -36      -31      +46      -38      +31      +9      +37      +32

C:\Users\saadg\source\repos\Assembly_Project5\Debug\Assembly_Project5.exe (process 17588) 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 . . .

```

```

Microsoft Visual Studio Debug Console
PROGRAM FOR RANDOM NUMBER GENERATION

2181137417      1026205450      217948340      2681420722      3866739394      295130478      2419430872      330734421      2317231787      636346692

-12      +13      -11      -46      +27      +20      +0      -31      +15      -41

C:\Users\saadg\source\repos\Assembly_Project5\Debug\Assembly_Project5.exe (process 25616) 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 . . .

```

```

Microsoft Visual Studio Debug Console
PROGRAM FOR RANDOM NUMBER GENERATION

2969582134      2954498558      3010832226      2856157442      3314833086      1955208630      1734975563      2386133528      422301709      2028436507

-46      +15      -29      +19      -1      +36      -38      -45      +45      +23

C:\Users\saadg\source\repos\Assembly_Project5\Debug\Assembly_Project5.exe (process 648) 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 . . .

```