Ministerul Educației al Republicii Moldova

Universitatea Tehnică a Moldovei

Catedra Automatica și Tehnologii Informaționale

RAPORT

Lucrare de laborator Nr.3
la Arhitectura Calculatoarelor
Tema:Programe Liniare

A efectuat:

A verificat:

Chisinau 2016

Scopul Lucrării:
Lucrarea prezintă instrucţiunile pentru transferuri de date,instrucţiunile în aritmetica binară şi în aritmetica BCD.

Sarcina Lucrării:
Conform variantei elaboraţi 2 variante de program :
a)cu introducerea datelor de la tastatură şi afişarea rezultatelor pe ecran.
b)cu generarea datelor de intrare, utilizând procedurile Random32, RandomRange.

4	$Z=\begin{cases}(Y-2X)/5+150, dacă\ X>Y/2\\ 2X-64+Y, dacă\ X\le Y/2\end{cases}$

a)cu introducerea datelor de la tastatură şi afişarea rezultatelor pe ecran.
Codul sursa al programului

```
INCLUDE Irvine32.inc
.data
mes1 byte "Introduceti valoarea X:", 0
mes2 byte "Introduceti valoarea Y:", 0
mes3 byte "Rezultatul este:", 0
vrx dword 0
vry dword 0
rez dword 0
.code
main PROC
mov edx, offset mes1
call WriteString;
call ReadInt;
mov vrx, eax;
mov edx, offset mes2
call WriteString;
call ReadInt;
mov vry, eax

mov eax, vry
mov ebx, 0
mov bx, 2
mov dx, 0
idiv bx
mov ebx, vrx
cmp ebx, eax
jna con1

mov eax, vrx
mov bx, 2
mul bx
mov ebx, vry
sub ebx, eax
mov eax, ebx
mov bx, 5
cwd
idiv bx
add eax, 150
mov rez, eax
jmp ex
```

```
con1:mov eax, vrx
        mov bx, 2
        mul bx
        sub eax, 64
        add eax, vry
        mov rez, eax

        ex : mov edx, offset mes3
        call WriteString
        call WriteInt
        call Crlf

        exit
        main ENDP
        END main
```

Listingul programului

```
                            INCLUDE Irvine32.inc
                          C ; Include file for Irvine32.lib          (Irvine32.inc)
                          C
                          C ;OPTION CASEMAP:NONE          ; optional: make identifiers
case-sensitive
                          C
                          C INCLUDE SmallWin.inc          ; MS-Windows prototypes,
structures, and constants
                          C .NOLIST
                          C .LIST
                          C
                          C INCLUDE VirtualKeys.inc
                          C ; VirtualKeys.inc
                          C .NOLIST
                          C .LIST
                          C
                          C
                          C .NOLIST
                          C .LIST
                          C
 00000000                       .data
 00000000 58 3D 00              mes1 byte "X=",0
 00000003 59 3D 00              mes2 byte "Y=",0
 00000006 52 65 7A 75 6C        mes3 byte "Rezultatul este:",0
          74 61 74 75 6C
          20 65 73 74 65
          3A 00
 00000017 00000000              vrx dword 0
 0000001B 00000000              vry dword 0
 0000001F 00000000              rez dword 0
 00000000                       .code
```

```
00000000                    main PROC
00000000  E8 00000000 E    call Randomize
00000005  BA 00000000 R    mov edx,offset mes1
0000000A  E8 00000000 E    call WriteString;
0000000F  E8 00000000 E    call Random32;
00000014  E8 00000000 E    call WriteInt
00000019  E8 00000000 E    call Crlf
0000001E  A3 00000017 R    mov vrx,eax;
00000023  BA 00000003 R    mov edx,offset mes2
00000028  E8 00000000 E    call WriteString;
0000002D  E8 00000000 E    call Random32;
00000032  E8 00000000 E    call WriteInt
00000037  E8 00000000 E    call Crlf
0000003C  A3 0000001B R    mov vry,eax

00000041  A1 0000001B R    mov eax, vry
00000046  BB 00000000              mov ebx, 0
0000004B  66| BB 0002              mov bx, 2
0000004F  66| BA 0000              mov dx, 0
00000053  66| F7 FB          idiv bx
00000056  8B 1D 00000017 R         mov ebx, vrx
0000005C  3B D8              cmp ebx, eax
0000005E  76 2B              jna con1

00000060  A1 00000017 R    mov eax, vrx
00000065  66| BB 0002              mov bx, 2
00000069  66| F7 E3          mul bx
0000006C  8B 1D 0000001B R         mov ebx, vry
00000072  2B D8              sub ebx, eax
00000074  8B C3              mov eax, ebx
00000076  66| BB 0005              mov bx, 5
0000007A  66| 99              cwd
0000007C  66| F7 FB          idiv bx
0000007F  05 00000096              add eax, 150
00000084  A3 0000001F R    mov rez, eax
00000089  EB 1A              jmp ex

0000008B  A1 00000017 R    con1:mov eax, vrx
00000090  66| BB 0002                    mov bx, 2
00000094  66| F7 E3               mul bx
00000097  83 E8 40                 sub eax, 64
0000009A  03 05 0000001B R                 add eax, vry
000000A0  A3 0000001F R            mov rez, eax

000000A5  BA 00000006 R            ex : mov edx, offset mes3
000000AA  E8 00000000 E            call WriteString
```

```
000000AF  E8 00000000 E           call WriteInt
000000B4  E8 00000000 E           call Crlf

                                  exit
000000B9  6A 00         *         push   +000000000h
000000BB  E8 00000000 E   *         call   ExitProcess
000000C0                          main ENDP
                                  END main
```

```
Introduceti valoarea X:10
Introduceti valoarea Y:6
Rezultatul este:+148
```

b)cu generarea datelor de intrare, utilizând procedurile Random32, RandomRange.

Codul sursa al programului

```
INCLUDE Irvine32.inc
.data
mes1 byte "X=",0
mes2 byte "Y=",0
mes3 byte "Rezultatul este:",0
vrx dword 0
vry dword 0
rez dword 0
.code
main PROC
call Randomize
mov edx,offset mes1
call WriteString;
call Random32;
call WriteInt
call Crlf
mov vrx,eax;
mov edx,offset mes2
call WriteString;
call Random32;
call WriteInt
call Crlf
mov vry,eax

mov eax, vry
mov ebx, 0
mov bx, 2
mov dx, 0
idiv bx
mov ebx, vrx
cmp ebx, eax
jna con1

mov eax, vrx
mov bx, 2
mul bx
mov ebx, vry
sub ebx, eax
mov eax, ebx
mov bx, 5
```

```
cwd
idiv bx
add eax, 150
mov rez, eax
jmp ex

con1:   mov eax, vrx
        mov bx, 2
        mul bx
        sub eax, 64
        add eax, vry
        mov rez, eax

        ex : mov edx, offset mes3
        call WriteString
        call WriteInt
        call Crlf

        exit
        main ENDP
        END main
```

Listingul Programului

```
                            INCLUDE Irvine32.inc
                          C ; Include file for Irvine32.lib          (Irvine32.inc)
                          C
                          C ;OPTION CASEMAP:NONE          ; optional: make identifiers
case-sensitive
                          C
                          C INCLUDE SmallWin.inc          ; MS-Windows prototypes,
structures, and constants
                          C .NOLIST
                          C .LIST
                          C
                          C INCLUDE VirtualKeys.inc
                          C ; VirtualKeys.inc
                          C .NOLIST
                          C .LIST
                          C
                          C
                          C .NOLIST
                          C .LIST
                          C
 00000000                       .data
 00000000 58 3D 00              mes1 byte "X=",0
 00000003 59 3D 00              mes2 byte "Y=",0
 00000006 52 65 7A 75 6C        mes3 byte "Rezultatul este:",0
          74 61 74 75 6C
          20 65 73 74 65
          3A 00
 00000017 00000000              vrx dword 0
```

```
0000001B 00000000           vry dword 0
0000001F 00000000           rez dword 0
00000000                    .code
00000000                    main PROC
00000000  E8 00000000 E    call Randomize
00000005  BA 00000000 R    mov edx,offset mes1
0000000A  E8 00000000 E    call WriteString;
0000000F  E8 00000000 E    call Random32;
00000014  E8 00000000 E    call WriteInt
00000019  E8 00000000 E    call Crlf
0000001E  A3 00000017 R    mov vrx,eax;
00000023  BA 00000003 R    mov edx,offset mes2
00000028  E8 00000000 E    call WriteString;
0000002D  E8 00000000 E    call Random32;
00000032  E8 00000000 E    call WriteInt
00000037  E8 00000000 E    call Crlf
0000003C  A3 0000001B R    mov vry,eax

00000041  A1 0000001B R    mov eax, vry
00000046  BB 00000000              mov ebx, 0
0000004B  66| BB 0002              mov bx, 2
0000004F  66| BA 0000              mov dx, 0
00000053  66| F7 FB           idiv bx
00000056  8B 1D 00000017 R         mov ebx, vrx
0000005C  3B D8               cmp ebx, eax
0000005E  76 2B               jna con1

00000060  A1 00000017 R    mov eax, vrx
00000065  66| BB 0002              mov bx, 2
00000069  66| F7 E3           mul bx
0000006C  8B 1D 0000001B R         mov ebx, vry
00000072  2B D8               sub ebx, eax
00000074  8B C3               mov eax, ebx
00000076  66| BB 0005              mov bx, 5
0000007A  66| 99               cwd
0000007C  66| F7 FB           idiv bx
0000007F  05 00000096              add eax, 150
00000084  A3 0000001F R    mov rez, eax
00000089  EB 1A               jmp ex

0000008B  A1 00000017 R    con1:mov eax, vrx
00000090  66| BB 0002                    mov bx, 2
00000094  66| F7 E3              mul bx
00000097  83 E8 40                sub eax, 64
0000009A  03 05 0000001B R                add eax, vry
000000A0  A3 0000001F R           mov rez, eax
```

```
000000A5  BA 00000006 R          ex : mov edx, offset mes3
000000AA  E8 00000000 E          call WriteString
000000AF  E8 00000000 E          call WriteInt
000000B4  E8 00000000 E          call Crlf

                                 exit
000000B9  6A 00         *        push   +000000000h
000000BB  E8 00000000 E  *         call   ExitProcess
000000C0                         main ENDP
                                 END main
```

```
X=+453469560
Y=+1917202018
Rezultatul este:-1924269806
```

Concluzie

In lucrarea de laborator nr.3 am realizat un program ce rezolva o operatie.Au fost obtinute noi abilitati in utilizarea instructiunilor in aritmetica binara:adunare,scadere,inmultire,impartire si utilizarea salturilor conditionate si neconditionate.De asemenea am utilizat procedurile Random32 si RandomRange.