TASK 1

MAXIMUM NUMBER FROM A SET OF 32-BIT NUMBERS:

CODE:

```asm
l2task1.asm
1    .model tiny
2    .486
3    .data
4    ;Assuming unsigned comparison with array of 5 elements
5    array dd 11111111h, 22222222h, 33333333h, 44444444h, 55555555h
6    result dd ?
7    .code
8    .startup
9        lea si,array
10       mov eax,[si]
11       mov cl,05h
12       add si,04h
13   l2: cmp eax,[si]
14       jnb l1
15       mov eax,[si]
16   l1: add si,04h
17       dec cl
18       jnz l2
19       mov result,eax
20   .exit
21   end
```

ASSEMBLING AND DEBUGGING:


```
DOSBox 0.74, Cpu speed:    3000 cycles, Frames...    —    □    ×
Libraries [.lib]:
Definitions File [nul.def]:

D:\MASM\MASM611\BIN>debugx l2task1.com
-u 0100
0863:0100 8D362401        LEA     SI,[0124]
0863:0104 668B04          MOV     EAX,[SI]
0863:0107 B105            MOV     CL,05
0863:0109 83C604          ADD     SI,+04
0863:010C 663B04          CMP     EAX,[SI]
0863:010F 7303            JAE     0114
0863:0111 668B04          MOV     EAX,[SI]
0863:0114 83C604          ADD     SI,+04
0863:0117 FEC9            DEC     CL
0863:0119 75F1            JNZ     010C
0863:011B 66A33801        MOV     [0138],EAX
0863:011F B44C            MOV     AH,4C
-rx
386 regs on
-g 011f
EAX=55555555 EBX=00000000 ECX=00000000 EDX=00000000 ESP=0000FFFE EBP=00000000
ESI=0000013C EDI=00000000 EIP=0000011F EFL=00007246 NV UP EI PL ZR NA PE NC
DS=0863 ES=0863 SS=0863 CS=0863 FS=0000 GS=0000
0863:011F B44C            MOV     AH,4C
-S_
```



```
DOSBox 0.74, Cpu speed:    3000 cycles, Frames...    —    □    ×
0863:010F 7303            JAE     0114
0863:0111 668B04          MOV     EAX,[SI]
0863:0114 83C604          ADD     SI,+04
0863:0117 FEC9            DEC     CL
0863:0119 75F1            JNZ     010C
0863:011B 66A33801        MOV     [0138],EAX
0863:011F B44C            MOV     AH,4C
-rx
386 regs on
-g 011f
EAX=55555555 EBX=00000000 ECX=00000000 EDX=00000000 ESP=0000FFFE EBP=00000000
ESI=0000013C EDI=00000000 EIP=0000011F EFL=00007246 NV UP EI PL ZR NA PE NC
DS=0863 ES=0863 SS=0863 CS=0863 FS=0000 GS=0000
0863:011F B44C            MOV     AH,4C
-d ds:0124
0863:0120                 11 11 11 11-22 22 22 22 33 33 33 33       ...."""""3333
0863:0130  44 44 44 44 55 55 55 55-55 55 55 55 8B EC FF  DDDDUUUUUUUU...
0863:0140  76 06 9A 2D 14 EF 06 8B-E5 5D CB 55 8B EC 83 3E v..-.....].U...>
0863:0150  06 57 02 73 13 8A 46 08-2A E4 50 FF 76 06 9A 0E .W.s..F.*.P.v...
0863:0160  00 DB 09 83 C4 04 EB 30-8B 76 06 8A 04 22 C0 74 .......0.v..".t
0863:0170  25 2A E4 50 0E E8 F4 00-83 C4 02 23 C0 74 05 FF %*.P.......#.t..
0863:0180  46 06 EB 0D 8B 76 06 8A-04 3A 46 08 75 03 96 EB F....v...:F.u...
0863:0190  07 FF 46 06 EB D2 2B C0-5D CB 55 8B EC 83 3E 06 ..F...+.].U...>.
0863:01A0  57 02 73 15          -                          W.s.
-S_
```

TASK 2

ADD 2 16 BYTE NUMBERS:

a. **AS 16-BIT DATA:**

CODE:

```
[10|01] l2task2.asm
1    .model tiny
2    .486
3    .data
4    ; 2 Arrays of 16 byte data are added and result is stored in array2
5    array1 db 5ah, 29h, 0ah, 79h, 76h, 98h, 0bh, 6fh, 7fh, 2eh, 02h, 08h, 1eh, 14h, 17h, 91h
6    array2 db 31h, 2bh, 40h, 10h, 7fh, 18h, 24h, 62h, 24h, 87h, 64h, 23h, 3eh, 2dh, 2eh, 90h
7    .code
8    .startup
9        lea si,array1
10       lea di,array2
11       mov cl,08h
12       mov bl,00
13       clc
14   x1: mov ax,[si]
15       adc [di],ax
16       add si,02h
17       add di,02h
18       dec cl
19       jnz x1
20       jnc x2
21       inc bl
22   x2: mov [di],bl
23   .exit
24   end
```

ASSEMBLING AND DEBUGGING:

```
DOSBox 0.74, Cpu speed:    3000 cycles, Frames...    —    □    ✕
Copyright (C) Microsoft Corp 1984-1992.  All rights reserved.

Object Modules [.obj]: l2task2.obj/t
Run File [l2task2.com]: "l2task2.com"
List File [nul.map]: NUL
Libraries [.lib]:
Definitions File [nul.def]:

D:\MASM\MASM611\BIN>debugx l2task2.com
-u 0100
0863:0100 8D362601        LEA     SI,[0126]
0863:0104 8D3E3601        LEA     DI,[0136]
0863:0108 B108            MOV     CL,08
0863:010A B300            MOV     BL,00
0863:010C F8              CLC
0863:010D 8B04            MOV     AX,[SI]
0863:010F 1105            ADC     [DI],AX
0863:0111 83C602          ADD     SI,+02
0863:0114 83C702          ADD     DI,+02
0863:0117 FEC9            DEC     CL
0863:0119 75F2            JNZ     010D
0863:011B 7302            JAE     011F
0863:011D FEC3            INC     BL
0863:011F 881D            MOV     [DI],BL
-S_
```

```
DOSBox 0.74, Cpu speed:    3000 cycles, Frames...    —    □    ✕
0863:0111 83C602          ADD     SI,+02
0863:0114 83C702          ADD     DI,+02
0863:0117 FEC9            DEC     CL
0863:0119 75F2            JNZ     010D
0863:011B 7302            JAE     011F
0863:011D FEC3            INC     BL
0863:011F 881D            MOV     [DI],BL
-u
0863:0121 B44C            MOV     AH,4C
0863:0123 CD21            INT     21
0863:0125 005A29          ADD     [BP+SI+29],BL
0863:0128 0A7976          OR      BH,[BX+DI+76]
0863:012B 98              CBW
0863:012C 0B6F7F          OR      BP,[BX+7F]
0863:012F 2E0208          ADD     CL,CS:[BX+SI]
0863:0132 1E              PUSH    DS
0863:0133 1417            ADC     AL,17
0863:0135 91              XCHG    AX,CX
0863:0136 312B            XOR     [BP+DI],BP
0863:0138 40              INC     AX
0863:0139 107F18          ADC     [BX+18],BH
0863:013C 2462            AND     AL,62
0863:013E 2487            AND     AL,87
0863:0140 64233E2D2E      AND     DI,FS:[2E2D]
-S_
```

```
DOSBox 0.74, Cpu speed:    3000 cycles, Frames...    —    □    ✕
0863:0136 312B            XOR     [BP+DI],BP
0863:0138 40              INC     AX
0863:0139 107F18          ADC     [BX+18],BH
0863:013C 2462            AND     AL,62
0863:013E 2487            AND     AL,87
0863:0140 64233E2D2E      AND     DI,FS:[2E2D]
-r
AX=FFFF  BX=0000  CX=0046  DX=0000  SP=FFFE  BP=0000  SI=0000  DI=0000
DS=0863  ES=0863  SS=0863  CS=0863  IP=0100   NV UP EI PL ZR NA PE NC
0863:0100 8D362601        LEA     SI,[0126]                         DS:0126=295A
-g 0121
AX=9117  BX=0000  CX=0000  DX=0000  SP=FFFE  BP=0000  SI=0136  DI=0146
DS=0863  ES=0863  SS=0863  CS=0863  IP=0121   NV UP EI PL ZR NA PE NC
0863:0121 B44C            MOV     AH,4C
-d ds:0136
0863:0130                          8B 54-4A 89 F5 B0 2F D1 A3 B5      .TJ.../...
0863:0140  66 2B 5C 41 45 21 00 8B-E5 5D CB 55 8B EC 83 3E  f+\AE!...].U...>
0863:0150  06 57 02 73 13 8A 46 08-2A E4 50 FF 76 06 9A 0E  .W.s..F.*.P.v...
0863:0160  00 DB 09 83 C4 04 EB 30-8B 76 06 8A 04 22 C0 74  .......0.v...".t
0863:0170  25 2A E4 50 0E E8 F4 00-83 C4 02 23 C0 74 05 FF  %*.P......#.t...
0863:0180  46 06 EB 0D 8B 76 06 8A-04 3A 46 08 75 03 96 EB  F....v...:F.u...
0863:0190  07 FF 46 06 EB D2 2B C0-5D CB 55 8B EC 83 3E 06  ..F...+.].U...>.
0863:01A0  57 02 73 15 8A 46 0A 2A-E4 50 FF 76 08 FF 76 06  W.s..F.*.P.v..v.
0863:01B0  0E E8 B2 FC 83 C4          -                      ......
-S
```

b. AS 32-BIT DATA:

CODE:

```
[io] l2task2.asm
1   .model tiny
2   .486
3   .data
4   ; 2 Arrays of 16 byte data are added and result is stored in array2
5   array1 db 5ah, 29h, 0ah, 79h, 76h, 98h, 0bh, 6fh, 7fh, 2eh, 02h, 08h, 1eh, 14h, 17h, 91h
6   array2 db 31h, 2bh, 40h, 10h, 7fh, 18h, 24h, 62h, 24h, 87h, 64h, 23h, 3eh, 2dh, 2eh, 90h
7   .code
8   .startup
9       lea si,array1
10      lea di,array2
11      mov cl,04h
12      mov bl,00
13      clc
14  x1: mov eax,[si]
15      adc [di],eax
16      add si,04h
17      add di,04h
18      dec cl
19      jnz x1
20      jnc x2
21      inc bl
22  x2: mov [di],bl
23  .exit
24  end
```

ASSEMBLING AND DEBUGGING:

```
DOSBox 0.74, Cpu speed:     3000 cycles, Frames...    —    □    ×
Microsoft (R) Segmented Executable Linker  Version 5.31.009 Jul 13 1992
Copyright (C) Microsoft Corp 1984-1992.  All rights reserved.

Object Modules [.obj]: l2task2.obj/t
Run File [l2task2.com]: "l2task2.com"
List File [nul.map]: NUL
Libraries [.lib]:
Definitions File [nul.def]:

D:\MASM\MASM611\BIN>debugx l2task2.com
-u 100
0863:0100 8D362801           LEA     SI,[0128]
0863:0104 8D3E3801           LEA     DI,[0138]
0863:0108 B104               MOV     CL,04
0863:010A B300               MOV     BL,00
0863:010C F8                 CLC
0863:010D 668B04             MOV     EAX,[SI]
0863:0110 661105             ADC     [DI],EAX
0863:0113 83C604             ADD     SI,+04
0863:0116 83C704             ADD     DI,+04
0863:0119 FEC9               DEC     CL
0863:011B 75F0               JNZ     010D
0863:011D 7302               JAE     0121
0863:011F FEC3               INC     BL
-S_
```

```
DOSBox 0.74, Cpu speed:     3000 cycles, Frames...    —    □    ×
0863:0110 661105             ADC     [DI],EAX
0863:0113 83C604             ADD     SI,+04
0863:0116 83C704             ADD     DI,+04
0863:0119 FEC9               DEC     CL
0863:011B 75F0               JNZ     010D
0863:011D 7302               JAE     0121
0863:011F FEC3               INC     BL
-u
0863:0121 881D               MOV     [DI],BL
0863:0123 B44C               MOV     AH,4C
0863:0125 CD21               INT     21
0863:0127 005A29             ADD     [BP+SI+29],BL
0863:012A 0A7976             OR      BH,[BX+DI+76]
0863:012D 98                 CBW
0863:012E 0B6F7F             OR      BP,[BX+7F]
0863:0131 2E0208             ADD     CL,CS:[BX+SI]
0863:0134 1E                 PUSH    DS
0863:0135 1417               ADC     AL,17
0863:0137 91                 XCHG    AX,CX
0863:0138 312B               XOR     [BP+DI],BP
0863:013A 40                 INC     AX
0863:013B 107F18             ADC     [BX+18],BH
0863:013E 2462               AND     AL,62
0863:0140 2487               AND     AL,87
-S
```

```
DOSBox 0.74, Cpu speed:     3000 cycles, Frames...    —    □    ×
0863:013B 107F18             ADC     [BX+18],BH
0863:013E 2462               AND     AL,62
0863:0140 2487               AND     AL,87
-r
AX=FFFF  BX=0000  CX=0048  DX=0000  SP=FFFE  BP=0000  SI=0000  DI=0000
DS=0863  ES=0863  SS=0863  CS=0863  IP=0100  NV UP EI PL ZR NA PE NC
0863:0100 8D362801           LEA     SI,[0128]                    DS:0128=295A
-rx
386 regs on
-g 0123
EAX=9117141E EBX=00000000 ECX=00000000 EDX=00000000 ESP=0000FFFE EBP=00000000
ESI=00000138 EDI=00000148 EIP=00000123 EFL=00007246 NV UP EI PL ZR NA PE NC
DS=0863 ES=0863 SS=0863 CS=0863 FS=0000 GS=0000
0863:0123 B44C               MOV     AH,4C
-d ds:0138
0863:0130                          -8B 54 4A 89 F5 B0 2F D1           .TJ...Z.
0863:0140  A3 B5 66 2B 5C 41 45 21-00 5D CB 55 8B EC 83 3E  ..f+\AE!.].U...>
0863:0150  06 57 02 73 13 8A 46 08-2A E4 50 FF 76 06 9A 0E  .W.s..F.*.P.v...
0863:0160  00 DB 09 83 C4 04 EB 30-8B 76 06 8A 04 22 C0 74  .......0.v...".t
0863:0170  25 2A E4 50 0E E8 F4 00-83 C4 02 23 C0 74 05 FF  %*.P.......#.t..
0863:0180  46 06 EB 0D 8B 76 06 8A-04 3A 46 08 75 03 96 EB  F....v...:F.u...
0863:0190  07 FF 46 06 EB D2 2B C0-5D CB 55 8B EC 83 3E 06  ..F...+.].U...>.
0863:01A0  57 02 73 15 8A 46 0A 2A-E4 50 FF 76 08 FF 76 06  W.s..F.*.P.v..v.
0863:01B0  0E E8 B2 FC 83 C4 06 EB-                         ........
-S
```