

7. Se dau două cuvinte A și B. Să se obțină dublucuvântul C:

- biții 0-4 ai lui C au valoarea 1
- biții 5-11 ai lui C coincid cu biții 0-6 ai lui A
- biții 16-31 ai lui C au valoarea 0000000001100101b = Q
- biții 12-15 ai lui C coincid cu biții 8-11 ai lui B

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A DW 1001_1100_0110_0101b      mov ECX, 0065001Fh ; ECX = {Q}0..00111111b
B DW 0011_0111_1101_0000b      mov AX, [ A ] ; AX = A = 1001_1100_0110_0101b (9C65h)
C RESD 1                        and AX, 0_007Fh ; AX = 00000000_1100101b (0005h)
                                ror CX, 5 ; CX = 1111_1000_0000_0000b (F800h)
                                or CX, AX ; CX = 1111_1000_0110_0101b (F865h)
                                ror CX, 7 ; CX = 1100_1011_1111_0000b (CBF0h)
                                mov AL, [B+1] ; AL = HIGH(B) = 0011_0111b (37h)
                                and AL, 0Fh ; AL &= 1111b = 0000_0111b (07h)
                                or CL, AL ; CL = 1111_0111b (F7h)
                                ror CX, 4 ; CX = 0111_1100_1011_1111b (7CBFh)
                                mov [C], ECX ; [C] = 00657CBFh

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CPU - main thread, module 07

Address	Hex dump	Assembly
00402000	B9 1F006500	MOV ECX,65001F
00402005	66:A1 001040	MOV AX,WORD PTR DS:[401000]
00402008	66:83E0 7F	AND AX,007F
0040200F	66:C1C9 05	ROR CX,5
00402013	66:09C1	OR CX,AX
00402016	66:C1C9 07	ROR CX,7
0040201A	A0 03104000	MOV AL,BYTE PTR DS:[401003]
0040201F	24 0F	AND AL,0F
00402021	08C1	OR CL,AL
00402023	66:C1C9 04	ROR CX,4
00402027	890D 04104000	MOV DWORD PTR DS:[401004],ECX
0040202D	6A 00	PUSH 0
0040202F	FF15 3C304000	CALL DWORD PTR DS:[<msvcrt.exit>]
00402035	0000	ADD BYTE PTR DS:[EAX],AL
00402037	0000	ADD BYTE PTR DS:[EAX],AL
00402039	0000	ADD BYTE PTR DS:[EAX],AL
0040203B	0000	ADD BYTE PTR DS:[EAX],AL
0040203D	0000	ADD BYTE PTR DS:[EAX],AL
0040203F	0000	ADD BYTE PTR DS:[EAX],AL
00402041	0000	ADD BYTE PTR DS:[EAX],AL
00402043	0000	ADD BYTE PTR DS:[EAX],AL
00402045	0000	ADD BYTE PTR DS:[EAX],AL
00402047	0000	ADD BYTE PTR DS:[EAX],AL
00402049	0000	ADD BYTE PTR DS:[EAX],AL
0040204B	0000	ADD BYTE PTR DS:[EAX],AL
0040204D	0000	ADD BYTE PTR DS:[EAX],AL
0040204F	0000	ADD BYTE PTR DS:[EAX],AL
00402051	0000	ADD BYTE PTR DS:[EAX],AL
00402053	0000	ADD BYTE PTR DS:[EAX],AL
00402055	0000	ADD BYTE PTR DS:[EAX],AL
00402057	0000	ADD BYTE PTR DS:[EAX],AL
00402059	0000	ADD BYTE PTR DS:[EAX],AL
0040205B	0000	ADD BYTE PTR DS:[EAX],AL
0040205D	0000	ADD BYTE PTR DS:[EAX],AL
0040205F	0000	ADD BYTE PTR DS:[EAX],AL
00402061	0000	ADD BYTE PTR DS:[EAX],AL

Stack [0019FF70]=0

Address	Hex dump	Comment
0019FF74	C754F6359	RETURN to KERNEL32.BaseThreadInitThunk
0019FF7C	754F6340	KERNEL32.BaseThreadInitThunk
0019FF80	0019FFDC	RETURN to ntdll.76F57C14
0019FF84	76F57C14	RETURN to ntdll.76F57C14
0019FF88	00248000	
0019FF8C	D5AEE0DF	
0019FF90	00000000	
0019FF94	00000000	
0019FF98	00248000	
0019FF9C	00000000	
0019FFA0	00000000	
0019FFA4	00000000	
0019FFA8	00000000	
0019FFAC	00000000	

Registers (FPU)

Register	Value
EAX	00190007
ECX	00657CBF
EDX	00402000 07.<ModuleEntryPoint>
EBX	00248000
ESP	0019FF74 ASCII "YoU"
EBP	0019FF80
ESI	00402000 07.<ModuleEntryPoint>
EDI	00402000 07.<ModuleEntryPoint>
EIP	0040202D 07.0040202D
C 0	ES 002B 32bit 0(FFFFFFFF)
P 0	CS 0023 32bit 0(FFFFFFFF)
A 0	SS 002B 32bit 0(FFFFFFFF)
Z 0	DS 002B 32bit 0(FFFFFFFF)
S 1	FS 0053 32bit 24B000(FFF)
T 0	GS 002B 32bit 0(FFFFFFFF)
O 0	LastErr 000000BB ERROR_SEM_NOT_F
EFL	00000282 (NO,NB,NE,A,S,PO,L,LE)
ST0	empty 0.0
ST1	empty 0.0
ST2	empty 0.0
ST3	empty 0.0
ST4	empty 0.0
ST5	empty 0.0
ST6	empty 0.0
ST7	empty 0.0
FST	0000 Cond 0 0 0 0 Err 0 0 0 0
FCW	027F Prec NEAR,53 Mask 1 1 1
Last cmd	0000:00000000
XMM0	00000000 00000000 00000000 00000000
XMM1	00000000 00000000 00000000 00000000
XMM2	00000000 00000000 00000000 00000000
XMM3	00000000 00000000 00000000 00000000

10. Sa se inlocuiasca bitii 0-3 ai octetului B cu bitii 8-11 ai cuvântului A.

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B DB 1100_1010b      mov AL, [ B ] ; AL = B = 1100_1010b (CAh)
A DW 1001_0011_1011_1000b and AL, 0_F0h ; AL = B & F0h = 1100_0000b (C0h)
                          mov AH, [A+1] ; AH = HIGH(A) = 1001_0011b (93h = bits 8-15 of A)
                          and AH, 0_Fh ; AH = AH & 0Fh = 0000_0011b (03h)
                          or AL, AH ; AL = AL | AH = 1100_0011b (C3h)
                          mov [ B ], AL ; B = AL = C3h
  
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CPU - main thread, module 10

Address	Disassembly	Comment
00402000	MOV AL, BYTE PTR DS:[401000]	
00402005	AND AL, F0	
00402007	MOV AH, BYTE PTR DS:[401002]	
0040200D	AND AH, 0F	
00402010	OR AL, AH	
00402012	MOV BYTE PTR DS:[401000], AL	
00402017	PUSH 0	
00402019	CALL DWORD PTR DS:[<msvcrt.exit>]	statu MSUCR
0040201F	ADD BYTE PTR DS:[EAX], AL	
00402021	ADD BYTE PTR DS:[EAX], AL	
00402023	ADD BYTE PTR DS:[EAX], AL	
00402025	ADD BYTE PTR DS:[EAX], AL	
00402027	ADD BYTE PTR DS:[EAX], AL	
00402029	ADD BYTE PTR DS:[EAX], AL	
0040202B	ADD BYTE PTR DS:[EAX], AL	
0040202D	ADD BYTE PTR DS:[EAX], AL	
0040202F	ADD BYTE PTR DS:[EAX], AL	
00402031	ADD BYTE PTR DS:[EAX], AL	
00402033	ADD BYTE PTR DS:[EAX], AL	
00402035	ADD BYTE PTR DS:[EAX], AL	
00402037	ADD BYTE PTR DS:[EAX], AL	
00402039	ADD BYTE PTR DS:[EAX], AL	
0040203B	ADD BYTE PTR DS:[EAX], AL	
0040203D	ADD BYTE PTR DS:[EAX], AL	
0040203F	ADD BYTE PTR DS:[EAX], AL	
00402041	ADD BYTE PTR DS:[EAX], AL	
00402043	ADD BYTE PTR DS:[EAX], AL	
00402045	ADD BYTE PTR DS:[EAX], AL	
00402047	ADD BYTE PTR DS:[EAX], AL	
00402049	ADD BYTE PTR DS:[EAX], AL	
0040204B	ADD BYTE PTR DS:[EAX], AL	
0040204D	ADD BYTE PTR DS:[EAX], AL	
0040204F	ADD BYTE PTR DS:[EAX], AL	
00402051	ADD BYTE PTR DS:[EAX], AL	
00402053	ADD BYTE PTR DS:[EAX], AL	
00402055	ADD BYTE PTR DS:[EAX], AL	

Registers (FPU)

Register	Value
EAX	001903C3
ECX	00402000 10.<ModuleEntryPoint>
EDX	00402000 10.<ModuleEntryPoint>
EBX	00353000
ESP	0019FF74 ASCII "YoU"
EBP	0019FF80
ESI	00402000 10.<ModuleEntryPoint>
EDI	00402000 10.<ModuleEntryPoint>
EIP	00402017 10.00402017
C 0	ES 002B 32bit 0(FFFFFFFF)
P 1	CS 0023 32bit 0(FFFFFFFF)
A 0	SS 002B 32bit 0(FFFFFFFF)
Z 0	DS 002B 32bit 0(FFFFFFFF)
S 1	FS 0053 32bit 356000(FFF)
T 0	GS 002B 32bit 0(FFFFFFFF)
D 0	
O 0	LastErr 000000BB ERROR_SEM_NOT_F
EFL	00000286 (NO, NB, NE, A, S, PE, L, LE)
ST0	empty 0.0
ST1	empty 0.0
ST2	empty 0.0
ST3	empty 0.0
ST4	empty 0.0
ST5	empty 0.0
ST6	empty 0.0
ST7	empty 0.0
FST	0000 Cond 0 0 0 Err 0 0 0 0
FCW	027F Prec NEAR, 53 Mask 1 1 1
Last cmd	0000:00000000
XMM0	00000000 00000000 00000000 00000000
XMM1	00000000 00000000 00000000 00000000
XMM2	00000000 00000000 00000000 00000000

Stack [0019FF70]=0

Address	Hex dump	Comment
0019FF74	754F6359	YoU RETURN to KERNEL32.BaseThreadIn
0019FF78	00353000	05
0019FF7C	754F6340	@cOu KERNEL32.BaseThreadInitThunk
0019FF80	0019FFDC	↓
0019FF84	76F57C14	RETURN to ntdll.76F57C14
0019FF88	00353000	05
0019FF8C	EB5FC4AD	←_3
0019FF90	00000000	
0019FF94	00000000	
0019FF98	00353000	05
0019FF9C	00000000	
0019FFA0	00000000	
0019FFA4	00000000	
0019FFA8	00000000	
0019FFAC	00000000	

32. Se dau cuvintele A, B si C. Sa se obtina octetul D ca suma a numerelor reprezentate de:

- o biții de pe pozițiile 0-4 ai lui A
- o biții de pe pozițiile 5-9 ai lui B

Octetul E este numarul reprezentat de bitii 10-14 ai lui C. Sa se obtina octetul F ca rezultatul scaderii D-E.

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A DW 00000000101_00100_b      mov DL, [ A ] ; DL = LOW(A) = 1010_0100b = A4h
B DW 110000_00010_10101b      and DL, 1Fh ; DL = DL & 0001_1111b = 000_00100b = 04h
C DW 1_00011_1001001000b      mov AX, [ B ] ; AX = B = 1100_0000_0101_0101b = C055h
D RESB 1                       ror AX, 5 ; AX = 1010_1110_0000_0010b = AE02h
E RESB 1                       and AL, 1Fh ; AL = AL & 0001_1111b = 000_00010b = 02h
F RESB 1                       add DL, AL ; DL = DL + AL = 04h + 02h = 06h
                                mov [D], DL ; save DL to var D
                                mov BL, [C+1] ; BL = HIGH(C) = 1000_1110h = 8Eh
                                shr BL, 2 ; BL = BL>>2 = 0010_0011 = 23h
                                and BL, 1Fh ; BL = BL & 1Fh = 000_00011 = 03h
                                mov [E], BL ; save BL to var E
                                sub DL, BL ; DL = 06h-03h = 03h
                                mov [F], DL ; save DL to var

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CPU - main thread, module 32

Address	Hex dump	Assembly
00402000	8A15 00104000	MOV DL, BYTE PTR DS:[401000]
00402006	80E2 1F	AND DL, 1F
00402009	66:81 02104000	MOV AX, WORD PTR DS:[401002]
0040200F	66:C1C8 05	ROR AX, 5
00402013	24 1F	AND AL, 1F
00402015	00C2	ADD DL, AL
00402017	8815 06104000	MOV BYTE PTR DS:[401006], DL
0040201D	8A1D 05104000	MOV BL, BYTE PTR DS:[401005]
00402023	C0E8 02	SHR BL, 2
00402026	80E3 1F	AND BL, 1F
00402029	881D 07104000	MOV BYTE PTR DS:[401007], BL
0040202F	28DA	SUB DL, BL
00402031	8815 08104000	MOV BYTE PTR DS:[401008], DL
00402037	6A 00	PUSH 0
00402039	FF15 3C304000	CALL DWORD PTR DS:[<&msvcrt.exit>]
0040203F	0000	ADD BYTE PTR DS:[EAX], AL
00402041	0000	ADD BYTE PTR DS:[EAX], AL
00402043	0000	ADD BYTE PTR DS:[EAX], AL
00402045	0000	ADD BYTE PTR DS:[EAX], AL
00402047	0000	ADD BYTE PTR DS:[EAX], AL
00402049	0000	ADD BYTE PTR DS:[EAX], AL
0040204B	0000	ADD BYTE PTR DS:[EAX], AL
0040204D	0000	ADD BYTE PTR DS:[EAX], AL
0040204F	0000	ADD BYTE PTR DS:[EAX], AL
00402051	0000	ADD BYTE PTR DS:[EAX], AL
00402053	0000	ADD BYTE PTR DS:[EAX], AL
00402055	0000	ADD BYTE PTR DS:[EAX], AL
00402057	0000	ADD BYTE PTR DS:[EAX], AL
00402059	0000	ADD BYTE PTR DS:[EAX], AL
0040205B	0000	ADD BYTE PTR DS:[EAX], AL
0040205D	0000	ADD BYTE PTR DS:[EAX], AL
0040205F	0000	ADD BYTE PTR DS:[EAX], AL
00402061	0000	ADD BYTE PTR DS:[EAX], AL
00402063	0000	ADD BYTE PTR DS:[EAX], AL
00402065	0000	ADD BYTE PTR DS:[EAX], AL
00402067	0000	ADD BYTE PTR DS:[EAX], AL

Stack [0019FF70]=0

Registers (FPU)

Register	Value
EAX	0019AE02
ECX	00402000 32.<ModuleEntryPoint>
EDX	00402003 32.00402003
EBX	003A3003
ESP	0019FF74 ASCII "YcOu"
EBP	0019FF80
ESI	00402000 32.<ModuleEntryPoint>
EDI	00402000 32.<ModuleEntryPoint>
EIP	00402037 32.00402037
C 0	ES 002B 32bit 0(FFFFFFFF)
P 1	CS 0023 32bit 0(FFFFFFFF)
A 0	SS 002B 32bit 0(FFFFFFFF)
Z 0	DS 002B 32bit 0(FFFFFFFF)
S 0	FS 0053 32bit 3A6000(FFF)
T 0	GS 002B 32bit 0(FFFFFFFF)
D 0	
O 0	LastErr 000000BB ERROR_SEM_NOT_F
EFL	00000206 (NO, NB, NE, A, NS, PE, GE, G)
ST0	empty 0.0
ST1	empty 0.0
ST2	empty 0.0
ST3	empty 0.0
ST4	empty 0.0
ST5	empty 0.0
ST6	empty 0.0
ST7	empty 0.0
FST	0000 Cond 0 0 0 0 Err 0 0 0 0
FCW	027F Prec NEAR, 53 Mask 1 1 1
Last cmd	0000:00000000
XMM0	00000000 00000000 00000000 00000000
XMM1	00000000 00000000 00000000 00000000
XMM2	00000000 00000000 00000000 00000000
XMM3	00000000 00000000 00000000 00000000

0019FF74 754F6359 YcOu RETURN to KERNEL32.BaseThreadInitThunk

0019FF78 003A3000 0: KERNEL32.BaseThreadInitThunk

0019FF7C 754F6340 0cOu

0019FF80 0019FFDC

0019FF84 76F57C14

0019FF88 003A3000 0: RETURN to ntdll.76F57C14

0019FF8C 9CAACEEB \$!t-E

0019FF90 00000000

0019FF94 00000000

0019FF98 003A3000 0:

0019FF9C 00000000

0019FFA0 00000000

0019FFA4 00000000

0019FFA8 00000000

0019FFAC 00000000