

ms a[0] = 1

q[6] = 0, 2, 3, 4, 5  
(a, b, c, d, e, f)  
1 2 9 7 28 33

group : a[i] = (i-1) + a[i-1]

group1 : a[i], (i-1) = a[i-1]  
a[2] = 1 + a[1]

```

0x000016fd <+38>: push    0x3c(%esp)
0x00001701 <+42>: call   0x2236 <read_six_numbers>
0x00001706 <+47>: add    $0x10,%esp
0x00001709 <+50>: cmpl   $0x1,0x4(%esp)
0x0000170e <+55>: jne    0x171b <Holoro+68>
0x00001710 <+57>: mov    $0x1,%esi
0x00001715 <+62>: lea    0x4(%esp),%edi
0x00001719 <+66>: jmp    0x173b <Holoro+100>
0x0000171b <+68>: call   0x214e <illegal_move>
0x00001720 <+73>: jmp    0x1710 <Holoro+57>
0x00001722 <+75>: mov    %esi,%eax
0x00001724 <+77>: imul   -0x4(%edi,%esi,4),%eax
0x00001729 <+82>: cmp    %eax,(%edi,%esi,4)
0x0000172c <+85>: je     0x1733 <Holoro+92>
0x0000172e <+87>: call   0x214e <illegal_move>
0x00001733 <+92>: add    $0x1,%esi
0x00001736 <+95>: cmp    $0x6,%esi
0x00001739 <+98>: je     0x1750 <Holoro+121>
0x0000173b <+100>: test   $0x1,%esi
0x00001741 <+106>: je     0x1722 <Holoro+75>
0x00001743 <+108>: mov    %esi,%eax
0x00001745 <+110>: add    -0x4(%edi,%esi,4),%eax
0x00001749 <+114>: cmp    %eax,(%edi,%esi,4)
0x0000174c <+117>: jne    0x172e <Holoro+87>
0x0000174e <+119>: jmp    0x1733 <Holoro+92>
0x00001750 <+121>: mov    0x1c(%esp),%eax
0x00001754 <+125>: xor    %gs:0x14,%eax
0x0000175b <+132>: jne    0x1764 <Holoro+141>
0x0000175d <+134>: add    $0x20,%esp
0x00001760 <+137>: pop    %ebx
    
```

→ compute a = 1

→ esi = 1

→ edi = address a

→ eax = 2

→ eax = 2 + (2) = 4

→ c = 4

→ esi = 2

→ compute 2 = 6

→ test 1 : 1 = 1

→ eax = 1

→ eax = 1 + 1

→ compute b = 2

→ esi = 2

→ compute 2 = 6

2e X

→ test 1 : 1 = 0

125 →

<+92> esi = 3

compute 3 = 6

test 3 : 1 = 1

<+108> eax = 3

eax = 3 + (address c)

= 3 + 4

= 7

compute d = 7

<+140> eax = 5 + 28

= 33

compute f = 33

<+92> = esi = 4

compute 4 = 6

test 4 : 1 = 0

<+110> eax = 4

eax = 4 \* (address d)

= 4 \* 7

= 28

compute e = 28

<+140> esi = 5

compute 5 = 6

test 5 : 1 = 1

eax = 5

esi = 6

compute 6 = 6

<+121> eax =

23269  
22106  
50790

```

mp of assembler code for function Holoh3ro:
0x00001769 <+0>:   endbr32
0x0000176d <+4>:   push    %ebx
0x0000176e <+5>:   sub     $0x24,%esp
0x00001771 <+8>:   call    0x13f0 <__x86.get_pc_thunk.bx>
0x00001776 <+13>:  add     $0x57ea,%ebx
0x0000177c <+19>:  mov     %gs:0x14,%eax
0x00001782 <+25>:  mov     %eax,0x18(%esp)
0x00001786 <+29>:  xor     %eax,%eax
0x00001788 <+31>:  lea     0x14(%esp),%eax
0x0000178c <+35>:  push    %eax
0x0000178d <+36>:  lea     0x13(%esp),%eax
0x00001791 <+40>:  push    %eax
0x00001792 <+41>:  lea     0x18(%esp),%eax
0x00001796 <+45>:  push    %eax
0x00001797 <+46>:  lea     -0x2c28(%ebx),%eax
0x0000179d <+52>:  push    %eax
0x0000179e <+53>:  push    0x3c(%esp)
0x000017a2 <+57>:  call    0x12e0 <__isoc99_sscanf@plt>
0x000017a7 <+62>:  add     $0x20,%esp
0x000017aa <+65>:  cmp     $0x2,%eax
0x000017ad <+68>:  jle     0x17ca <Holoh3ro+97>
0x000017af <+70>:  cmpl    $0x7,0x4(%esp)
0x000017b4 <+75>:  ja      0x18a2 <Holoh3ro+313>
0x000017ba <+81>:  mov     0x4(%esp),%eax
0x000017be <+85>:  mov     %ebx,%edx
0x000017c0 <+87>:  add     -0x2c00(%ebx,%eax,4),%edx
0x000017c7 <+94>:  notrack jmp    *%edx
0x000017ca <+97>:  call    0x214e <illegal_move>
0x000017cf <+102>: jmp     0x17af <Holoh3ro+70>
0x000017d1 <+104>: mov     $0x61,%eax
0x000017d6 <+109>: cmpl    $0x2ac,0x8(%esp)
0x000017de <+117>: je      0x18ac <Holoh3ro+323>
0x000017e4 <+123>: call    0x214e <illegal_move>

```

→ 0x00006eb8

→ 0x57 eac381

→ eax = 0

1 0x47

a b c

→ "%d %c %d"

→ compare eax : 2

→ compare a : 7

→ eax = operand a

→ edx = ebx

→ edx = edx + (ebx + 4) - 0x2c00

→ eax = 97 (a)

→ compare b : 689

```

0x000017e4 <+123>: call    0x214e <illegal_move>
0x000017e9 <+128>: mov     $0x61,%eax
0x000017ee <+133>: jmp     0x18ac <Holoh3ro+323>
0x000017f3 <+138>: mov     $0x73,%eax
0x000017f8 <+143>: cmpl    $0x3b3,0x8(%esp)
0x00001800 <+151>: je      0x18ac <Holoh3ro+323>
0x00001806 <+157>: call    0x214e <illegal_move>
0x0000180b <+162>: mov     $0x73,%eax
0x00001810 <+167>: jmp     0x18ac <Holoh3ro+323>
0x00001816 <+172>: mov     $0x6d,%eax
0x0000181a <+177>: cmpl    $0xd2,0x8(%esp)
0x00001827 <+185>: je      0x18ac <Holoh3ro+323>
0x00001828 <+191>: call    0x214e <illegal_move>
0x0000182d <+196>: mov     $0x6d,%eax

```

→ eax = 97 (a)

→ eax = 115 (s)

→ compare b : 997

→ eax = 115 (s)

→ eax = 109 (m)

→ compare b : 210

→ eax = 109 (m)

0x565b460

0x565b460

c = 99

mp18 = 740

compe 740 947

edx = 0x565b460 + (0x565b460 + 4) - 0x2c00

1498460128 x2 + 9 - 11269

edx = 0x565b460 + 3



0x0000182d	<+196>:	mov	\$0x6d,%eax	→ eax = 109 (m)
0x00001832	<+201>:	jmp	0x18ac <Holoh3ro+323>	
0x00001834	<+203>:	mov	\$0x61,%eax	→ eax = 97 (a)
0x00001839	<+208>:	cmpl	\$0xfffffe46,0x8(%esp)	→ compare b: ...
0x00001841	<+216>:	je	0x18ac <Holoh3ro+323>	
0x00001843	<+218>:	call	0x214e <illegal_move>	
0x00001848	<+223>:	mov	\$0x61,%eax	→ eax = 97 (a)
0x0000184d	<+228>:	jmp	0x18ac <Holoh3ro+323>	
0x0000184f	<+230>:	mov	\$0x6d,%eax	→ eax = 109 (m)
0x00001854	<+235>:	cmpl	\$0x4a,0x8(%esp)	→ compare b: 79 (j)
0x00001859	<+240>:	je	0x18ac <Holoh3ro+323>	
0x0000185b	<+242>:	call	0x214e <illegal_move>	
0x00001860	<+247>:	mov	\$0x6d,%eax	→ eax = 109 (m)
0x00001865	<+252>:	jmp	0x18ac <Holoh3ro+323>	
0x00001867	<+254>:	mov	\$0x70,%eax	→ eax = 112 (p)
0x0000186c	<+259>:	cmpl	\$0x2bf,0x8(%esp)	→ compare b: 703
0x00001874	<+267>:	je	0x18ac <Holoh3ro+323>	
0x00001876	<+269>:	call	0x214e <illegal_move>	
0x0000187b	<+274>:	mov	\$0x70,%eax	→ eax = 112 (p)
0x00001880	<+279>:	jmp	0x18ac <Holoh3ro+323>	
0x00001882	<+281>:	cmpl	\$0x301,0x8(%esp)	→ compare b: 769

0x00001882	<+281>:	cmpl	\$0x301,0x8(%esp)	
0x0000188a	<+289>:	jne	0x1893 <Holoh3ro+298>	
0x0000188c	<+291>:	call	0x214e <illegal_move>	
0x00001891	<+296>:	jmp	0x18a2 <Holoh3ro+313>	
0x00001893	<+298>:	call	0x214e <illegal_move>	
0x00001898	<+303>:	cmpl	\$0x1ee,0x8(%esp)	→ compare b: 499
0x000018a0	<+311>:	jne	0x188c <Holoh3ro+291>	

0x000018a0	<+311>:	jne	0x188c <Holoh3ro+291>	
0x000018a2	<+313>:	call	0x214e <illegal_move>	
0x000018a7	<+318>:	mov	\$0x6c,%eax	→ eax = 108 (l)
0x000018ac	<+323>:	cmp	%al,0x3(%esp)	→ compare
0x000018b0	<+327>:	jne	0x18c4 <Holoh3ro+347>	→ eax = c
0x000018b2	<+329>:	mov	0xc(%esp),%eax	
0x000018b5	<+333>:	xor	%gs:0x14,%eax	
0x000018bd	<+340>:	jne	0x18cb <Holoh3ro+354>	
0x000018bf	<+342>:	add	\$0x18,%esp	
0x000018c2	<+345>:	pop	%ebx	
0x000018c3	<+346>:	ret		
0x000018c4	<+347>:	call	0x214e <illegal_move>	
0x000018c9	<+352>:	jmp	0x18b2 <Holoh3ro+329>	
0x000018cb	<+354>:	call	0x3110 <__stack_chk_fail_local>	

0x63ffd2d9      0x00000001

bc

d  
100 → 73  
's'

Dump of assembler code for function Secret\_Society:

```

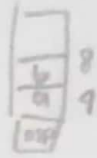
0x00001914 <+0>:    endbr32
0x00001918 <+4>:    push    %edi
0x00001919 <+5>:    push    %esi
0x0000191a <+6>:    push    %ebx
0x0000191b <+7>:    sub     $0x10,%esp
0x0000191e <+10>:   call    0x1dce <__x86.get_pc_thunk.si>
0x00001923 <+15>:   add     $0x563d,%esi
0x00001929 <+21>:   mov     %gs:0x14,%eax
0x0000192f <+27>:   mov     %eax,0xc(%esp)
0x00001933 <+31>:   xor     %eax,%eax
0x00001935 <+33>:   lea     0x8(%esp),%eax
0x00001939 <+37>:   push    %eax
0x0000193a <+38>:   lea     0x8(%esp),%eax
0x0000193e <+42>:   push    %eax
0x0000193f <+43>:   lea     -0x249d(%esi),%eax
0x00001945 <+49>:   push    %eax
0x00001946 <+50>:   push    0x2c(%esp)
0x0000194a <+54>:   mov     %esi,%ebx
0x0000194c <+56>:   call    0x12e0 <__isoc99_sscanf@plt>
0x00001951 <+61>:   add     $0x10,%esp
0x00001954 <+64>:   cmp     $0x2,%eax
0x00001957 <+67>:   jne     0x1971 <Secret_Society+93>
0x00001959 <+69>:   mov     0x4(%esp),%eax
0x0000195d <+73>:   sub     $0x2,%eax
0x00001960 <+76>:   cmp     $0x15,%eax
0x00001963 <+79>:   ja      0x1971 <Secret_Society+93>
0x00001965 <+81>:   mov     0x8(%esp),%eax
0x00001969 <+85>:   sub     $0x2,%eax
0x0000196c <+88>:   cmp     $0x15,%eax
0x0000196f <+91>:   jbe     0x1978 <Secret_Society+100>
0x00001971 <+93>:   mov     %esi,%ebx
0x00001973 <+95>:   call    0x214e <illegal_move>
0x00001978 <+100>:  mov     0x8(%esp),%ebx
0x0000197c <+104>:  mov     0x4(%esp),%edi

```

```

0x0000197c <+104>:  mov     0x4(%esp),%edi
0x00001980 <+108>:  sub     $0x8,%esp
0x00001983 <+111>:  push    %ebx
0x00001984 <+112>:  push    %edi
0x00001985 <+113>:  call    0x1ed0 <func4>
0x0000198a <+118>:  add     $0x10,%esp
0x0000198d <+121>:  mov     %eax,%ecx
0x0000198f <+123>:  mov     %ebx,%eax
0x00001991 <+125>:  imul    %edi,%eax
0x00001994 <+128>:  cltd
0x00001996 <+129>:  idiv    %ecx
0x00001997 <+131>:  cmp     $0x18,%eax
0x0000199a <+134>:  jne     0x19a0 <Secret_Society+156>
0x0000199c <+136>:  mov     0xc(%esp),%eax
0x0000199e <+140>:  xor     %gs:0x14,%eax
0x000019a0 <+147>:  jne     0x19b0 <Secret_Society+165>
0x000019a3 <+149>:  add     $0x10,%esp
0x000019a6 <+152>:  pop     %ebx
0x000019a8 <+153>:  pop     %esi
0x000019aa <+154>:  pop     %edi
0x000019ad <+155>:  ret
0x000019b0 <+156>:  mov     %esi,%ebx
0x000019b2 <+158>:  call    0x214e <illegal_move>
0x000019b7 <+163>:  jmp     0x19b0 <Secret_Society+136>
0x000019ba <+165>:  call    0x11b0 <__stack_chk_fail_local>

```



"%.d %.d"

loop: pos = 2

eax = a

ecx = a - 2

ecx = a - 2 = 21

ecx = b

b - 2

ebx = b

edi = a

esp - 8

ecx = ecx (horl %d)

ecx = ebx (a)

eax = eax + edi (a = a + b)

eax / ecx = 29 = (a + b) / gcd(a, b)

1 29 a ≤ 23  
2 12 b ≤ 23  
3 8 a = 3  
4 6 b = 8  
6 4



$gcd(a, b) = gcd(b, a \% b)$

$gcd(4, 2)$

$gcd(2, 0)$

# Dump of assembler code for function func4:

```

0x000018d0 <+0>:    endbr32
0x000018d4 <+4>:    sub     $0xc,%esp
0x000018d7 <+7>:    mov     0x10(%esp),%ecx
0x000018db <+11>:   mov     0x14(%esp),%eax
0x000018df <+15>:   cmp     %eax,%ecx
0x000018e1 <+17>:   jg      0x18ef <func4+31>
0x000018e3 <+19>:   mov     %eax,%edx
0x000018e5 <+21>:   test    %ecx,%ecx
0x000018e7 <+23>:   jne     0x1900 <func4+48>
0x000018e9 <+25>:   mov     %edx,%eax
0x000018eb <+27>:   add     $0xc,%esp
0x000018ee <+30>:   ret
0x000018ef <+31>:   sub     $0x8,%esp
0x000018f2 <+34>:   push    %ecx
0x000018f3 <+35>:   push    %eax
0x000018f4 <+36>:   call    0x18d0 <func4>
0x000018f9 <+41>:   add     $0x10,%esp
0x000018fc <+44>:   mov     %eax,%edx
0x000018fe <+46>:   jmp     0x18e9 <func4+25>
0x00001900 <+48>:   sub     $0x8,%esp
0x00001903 <+51>:   push    %ecx
0x00001904 <+52>:   cltd
0x00001905 <+53>:   idiv    %ecx
0x00001907 <+55>:   push    %edx
0x00001908 <+56>:   call    0x18d0 <func4>
0x0000190d <+61>:   add     $0x10,%esp
0x00001910 <+64>:   mov     %eax,%edx
0x00001912 <+66>:   jmp     0x18e9 <func4+25>

```

$\rightarrow a$   
 $\rightarrow b$   
 $\rightarrow$  Compute  $ecx:ecx$   
 $a = b$   
 $\rightarrow edx = b$   
 $\rightarrow$  test  $ecx:ecx$   $ecx = 0$   
 $a$   
 $\rightarrow$  return  
 $\rightarrow eax = b$

$\rightarrow gcd$

$\rightarrow a$   
 $\rightarrow a \div b$   $5 \div 2 = 2$   
 $edx = 1$   
 $\rightarrow gcd(2, 1)$

$idiv \rightarrow eax$  (horiz bas)  
 $\rightarrow edx$  (vert bas)

$gcd(1, 2)$   
 $5$

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  
 [ 12, 10, 4, 1, 13, 15, 2, 11, 9, 6, 7, 5, 10, 0, 3, 3 ]

16 element

```

0x000019b0 <+0>:      endbr32
0x000019c2 <+4>:      push    %esi
0x000019c3 <+5>:      push    %ebx
0x000019c4 <+6>:      sub     $0x14,%esp
0x000019c7 <+9>:      call   0x13f0 <__x86.get_pc_thunk.bx>
0x000019cc <+14>:     add     $0x5594,%ebx
0x000019d2 <+20>:     mov     %gs:0x14,%eax
0x000019d8 <+26>:     mov     %eax,0xc(%esp)
0x000019dc <+30>:     xor     %eax,%eax
0x000019de <+32>:     lea     0x8(%esp),%eax
0x000019e2 <+36>:     push    %eax
0x000019e3 <+37>:     lea     0x8(%esp),%eax
0x000019e7 <+41>:     push    %eax
0x000019e8 <+42>:     lea     -0x249d(%ebx),%eax
0x000019ee <+48>:     push    %eax
0x000019ef <+49>:     push    0x2c(%esp)
0x000019f3 <+53>:     call   0x12e0 <__isoc99_sscanf@plt>
0x000019f8 <+58>:     add     $0x10,%esp
0x000019fb <+61>:     cmp     $0x1,%eax
0x000019fe <+64>:     jle     0x1a58 <Area15+154>
0x00001a00 <+66>:     mov     0x4(%esp),%eax
0x00001a04 <+70>:     and     $0xf,%eax
0x00001a07 <+73>:     mov     %eax,0x4(%esp)
0x00001a0b <+77>:     cmp     $0xf,%eax
0x00001a0e <+80>:     je      0x1a40 <Area15+130>
0x00001a10 <+82>:     mov     $0x0,%ecx
0x00001a15 <+87>:     mov     $0x0,%edx
0x00001a1a <+92>:     lea     -0x2be0(%ebx),%esi
0x00001a20 <+98>:     add     $0x1,%edx
0x00001a23 <+101>:    mov     (%esi,%eax,4),%eax
0x00001a26 <+104>:    add     %eax,%ecx
0x00001a28 <+106>:    cmp     $0xf,%eax
0x00001a2b <+109>:    jne     0x1a20 <Area15+98>
0x00001a2d <+111>:    movl    $0xf,0x4(%esp)
0x00001a35 <+119>:    cmp     $0xf,%edx
0x00001a38 <+122>:    jne     0x1a40 <Area15+130>
  
```

```

0x00001a38 <+122>:    jne     0x1a40 <Area15+130>
0x00001a3a <+124>:    cmp     %ecx,0x8(%esp)
0x00001a3e <+128>:    je      0x1a45 <Area15+135>
0x00001a40 <+130>:    call   0x214e <illegal_move>
0x00001a45 <+135>:    mov     0xc(%esp),%eax
0x00001a49 <+139>:    xor     %gs:0x14,%eax
0x00001a50 <+146>:    jne     0x1a5f <Area15+161>
0x00001a52 <+148>:    add     $0x14,%esp
0x00001a55 <+151>:    pop     %ebx
0x00001a56 <+152>:    pop     %esi
0x00001a57 <+153>:    ret
0x00001a58 <+154>:    call   0x214e <illegal_move>
0x00001a5d <+159>:    jmp     0x1a60 <Area15+66>
0x00001a5f <+161>:    call   0x1110 <__stack_chk_fail_local>
  
```

"%d" "%d"  
 a b

eax = 6  
 or: a and 0xf (a%16)  
 1111

a = (a%16)  
 compare (a%16): 15

global label

ecx = 0  
 edx = 0  
 esi = ebx - 0x2be0  
 edx = 0 + 1 = 1

eax = 0x56559380 +  
 4 \* 2

ecx = 0x56559388  
 compare 0x56559388: 15  
 edx = 2

eax = 0x56559380 +  
 4 \* 0x56559388  
 ecx = 0x56559388 +

edx = 2, ecx = 0x56559380

problem : 3 (120-3)  
 3 117



a b c d e f  
1 2 3 4 5 6

Dump of assembler code for function Green\_Necromancer:

```

0x00001a64 <+0>: endbr32
0x00001a68 <+4>: push %ebp
0x00001a69 <+5>: push %edi
0x00001a6a <+6>: push %esi
0x00001a6b <+7>: push %ebx
0x00001a6c <+8>: sub $0x64,%esp
0x00001a6f <+11>: call 0x13f0 <__x86.get_pc_thunk.bx>
0x00001a74 <+16>: add $0x54ec,%ebx
0x00001a7a <+22>: mov %gs:0x14,%eax
0x00001a80 <+28>: mov %eax,0x54(%esp)
0x00001a84 <+32>: xor %eax,%eax
0x00001a86 <+34>: lea 0x24(%esp),%eax
0x00001a8a <+38>: push %eax
0x00001a8b <+39>: push 0x7c(%esp)
0x00001a8f <+43>: call 0x2236 <read_six_numbers>
0x00001a94 <+48>: lea 0x30(%esp),%ebp
0x00001a98 <+52>: add $0x10,%esp
0x00001a9b <+55>: movl $0x0,0xc(%esp)
0x00001aa3 <+63>: lea 0x34(%esp),%eax
0x00001aa7 <+67>: mov %eax,0x8(%esp)
0x00001aab <+71>: jmp 0x1ace <Green_Necromancer+106>
0x00001aad <+73>: call 0x214e <illegal_move>
0x00001ab2 <+78>: jmp 0x1adb <Green_Necromancer+119>
0x00001ab4 <+80>: add $0x4,%esi
0x00001ab7 <+83>: cmp %esi,0x8(%esp)
0x00001abb <+87>: je 0x1acb <Green_Necromancer+103>
0x00001abd <+89>: mov (%esi),%eax
0x00001abf <+91>: cmp %eax,-0x4(%edi)
0x00001ac2 <+94>: jne 0x1ab4 <Green_Necromancer+80>
0x00001ac4 <+96>: call 0x214e <illegal_move>
0x00001ac9 <+101>: jmp 0x1ab4 <Green_Necromancer+80>
0x00001acb <+103>: add $0x4,%ebp
0x00001ace <+106>: mov %ebp,%edi

```

→ ebp = address b  
→ set = 0  
→ eax = address f + 9 (1)  
→ op18 = address frq 19  
→ esi = address c  
compare address 9 : address 1  
→ eax = 2  
→ compare 1 : 2  
→ edi = address b

```

0x00001ad0 <+108>: mov -0x4(%ebp),%eax
0x00001ad3 <+111>: sub $0x1,%eax
0x00001ad6 <+114>: cmp $0x5,%eax
0x00001ad9 <+117>: ja 0x1aad <Green_Necromancer+73>
0x00001adb <+119>: addl $0x1,0xc(%esp)
0x00001ae0 <+124>: mov 0xc(%esp),%eax
0x00001ae4 <+128>: cmp $0x5,%eax
0x00001ae7 <+131>: jg 0x1aad <Green_Necromancer+137>
0x00001ae9 <+133>: mov %ebp,%esi
0x00001aeb <+135>: jmp 0x1abd <Green_Necromancer+89>
0x00001aed <+137>: mov $0x0,%esi
0x00001af2 <+142>: mov %esi,%edi
0x00001af4 <+144>: mov 0x1c(%esp,%esi,4),%ecx
0x00001af8 <+148>: mov $0x1,%eax
0x00001afd <+153>: lea 0x598(%ebx),%edx
0x00001b03 <+159>: cmp $0x1,%ecx
0x00001b06 <+162>: jle 0x1b12 <Green_Necromancer+174>
0x00001b08 <+164>: mov 0x8(%edx),%edx

```

edi = 1  
ecx = 2  
eax = 1  
edx = head  
compare ecx : 1  
2 : 1

→ eax = 1  
→ eax = 0  
→ compare 0 : 5  
→ set = 1  
→ eax = 1  
→ compare 1 : 5  
→ esi = address b  
→ esi = 0  
→ edi = 0  
→ ecx = esp + 0 + 28 (1) → 9  
→ eax = 1  
→ edx = ebx + 0x598  
0x598 = 1464 (head)  
→ compare ecx : 1  
2 : 1

edx  
= 0x598 (1464)

edx = 0  
edi = 0

ecx = 2

```

0x00001b08 <+164>: mov    0x8(%edx),%edx
0x00001b0b <+167>: add    $0x1,%eax
0x00001b0e <+170>: cmp    %ecx,%eax
0x00001b10 <+172>: jne    0x1b08 <Green_Necromancer+164>
0x00001b12 <+174>: mov    %edx,0x34(%esp,%edi,4)
0x00001b16 <+178>: add    $0x1,%esi
0x00001b19 <+181>: cmp    $0x6,%esi
0x00001b1c <+184>: jne    0x1af2 <Green_Necromancer+142>
0x00001b1e <+186>: mov    0x34(%esp),%esi
0x00001b22 <+190>: mov    0x38(%esp),%eax
0x00001b26 <+194>: mov    %eax,0x8(%esi)
0x00001b29 <+197>: mov    0x3c(%esp),%edx
0x00001b2d <+201>: mov    %edx,0x8(%eax)
0x00001b30 <+204>: mov    0x40(%esp),%eax
0x00001b34 <+208>: mov    %eax,0x8(%edx)
0x00001b37 <+211>: mov    0x44(%esp),%edx

```

edx = value (edx+8)  
ecx = 2  
compare 2:2

→ g = head  
→ ecx = 1  
→ compare 1:6  
→ 0x5655c4f8  
→ 0x5655c509  
→ 80x = 0x5655c509  
→ edx =

```

0x00001b37 <+211>: mov    0x44(%esp),%edx
0x00001b3b <+215>: mov    %edx,0x8(%eax)
0x00001b3e <+218>: mov    0x48(%esp),%eax
0x00001b42 <+222>: mov    %eax,0x8(%edx)
0x00001b45 <+225>: movl   $0x0,0x8(%eax)
0x00001b4c <+232>: mov    $0x5,%edi
0x00001b51 <+237>: jmp    0x1b5b <Green_Necromancer+247>
0x00001b53 <+239>: mov    0x8(%esi),%esi
0x00001b56 <+242>: sub    $0x1,%edi
0x00001b59 <+245>: je     0x1b6b <Green_Necromancer+263>
0x00001b5b <+247>: mov    0x8(%esi),%eax
0x00001b5e <+250>: mov    (%eax),%eax
0x00001b60 <+252>: cmp    %eax,(%esi)
0x00001b62 <+254>: jle    0x1b53 <Green_Necromancer+239>
0x00001b64 <+256>: call   0x214e <illegal_move>
0x00001b69 <+261>: jmp    0x1b53 <Green_Necromancer+239>
0x00001b6b <+263>: mov    0x4c(%esp),%eax
0x00001b6f <+267>: xor    %gs:0x14,%eax
0x00001b76 <+274>: jne    0x1b80 <Green_Necromancer+284>
0x00001b78 <+276>: add    $0x5c,%esp
0x00001b7b <+279>: pop    %ebx
0x00001b7c <+280>: pop    %esi
0x00001b7d <+281>: pop    %edi
0x00001b7e <+282>: pop    %ebp
0x00001b7f <+283>: ret
0x00001b80 <+284>: call   0x3110 <__stack_chk_fail_local>

```

→ 80x = 0x5655c509  
→ 80x = 326  
→ compare 326:336

compare 326:336

edx 0x5655c4f8

1. 0x00000146 = 326

2. aland: 0x5655c509, val: 326

3. 0x5655c510, val: 321

9. 0x5655c51c, val: 517

5. 0x5655c528, val: 960

6. 0x5655c030, val: 939

3, 1, 2, 6, 9, 5

test:

Compare 321: 326

Compare 326: 366

Compare 366: 979

Compare 979: 517



ebx = 0x4b460

Dump of assembler code for function Tanigox\_secret\_lair:

```

0x00001bda <+0>:      endbr32
0x00001bde <+4>:      push    %esi
0x00001bdf <+5>:      push    %ebx
0x00001be0 <+6>:      sub     $0x4,%esp
0x00001be3 <+9>:      call   0x13f0 <__x86.get_pc_thunk.bx>
0x00001be8 <+14>:     add     $0x5378,%ebx
0x00001bee <+20>:     call   0x2284 <read_line>
0x00001bf3 <+25>:     sub     $0x4,%esp
0x00001bf6 <+28>:     push    $0xa
0x00001bf8 <+30>:     push    $0x0
0x00001bfa <+32>:     push    %eax
0x00001bfb <+33>:     call   0x1360 <strtol@plt>
0x00001c00 <+38>:     mov     %eax,%esi
0x00001c02 <+40>:     lea     -0x67(%eax),%eax
0x00001c05 <+43>:     add     $0x10,%esp
0x00001c08 <+46>:     cmp     $0x7eb,%eax
0x00001c0d <+51>:     ja      0x1dba <Tanigox_secret_lair+480>
0x00001c13 <+57>:     sub     $0x8,%esp
0x00001c16 <+60>:     push    %esi
0x00001c17 <+61>:     lea     0x544(%ebx),%eax
0x00001c1d <+67>:     push    %eax
0x00001c1e <+68>:     call   0x1b85 <fun7>
0x00001c23 <+73>:     add     $0x10,%esp
0x00001c26 <+76>:     cmp     $0x5,%eax
0x00001c29 <+79>:     jne     0x1dc4 <Tanigox_secret_lair+490>
0x00001c2f <+85>:     sub     $0xc,%esp
0x00001c32 <+88>:     lea     -0x2ba0(%ebx),%eax
0x00001c38 <+94>:     push    %eax
0x00001c39 <+95>:     call   0x1290 <puts@plt>
0x00001c3e <+100>:    add     $0x8,%esp
0x00001c41 <+103>:    lea     -0x2b74(%ebx),%eax
0x00001c47 <+109>:    push    %eax
0x00001c48 <+110>:    push    $0x1
0x00001c4a <+112>:    call   0x1320 <__printf_chk@plt>
0x00001c4f <+117>:    add     $0x8,%esp

```

162  
103  
49

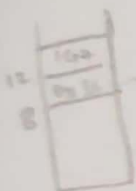
ebx = 103

Compare ebx: 2027

ebx = 149

ebx = 0x4b460

Compare ebx: 5



# Dump of assembler code for function **fun7**:

```

0x56556b85 <+0>:      endbr32
0x56556b89 <+4>:      push    %ebx
0x56556b8a <+5>:      sub     $0x8,%esp
0x56556b8d <+8>:      mov     0x10(%esp),%edx
0x56556b91 <+12>:     mov     0x14(%esp),%ecx
0x56556b95 <+16>:     test    %edx,%edx
0x56556b97 <+18>:     je      0x56556bd3 <fun7+78>
0x56556b99 <+20>:     mov     (%edx),%ebx
0x56556b9b <+22>:     cmp     %ecx,%ebx
0x56556b9d <+24>:     jg      0x56556bab <fun7+38>
0x56556b9f <+26>:     mov     $0x0,%eax
0x56556ba4 <+31>:     jne     0x56556bbe <fun7+57>
0x56556ba6 <+33>:     add     $0x8,%esp
0x56556ba9 <+36>:     pop     %ebx
0x56556baa <+37>:     ret
0x56556bab <+38>:     sub     $0x8,%esp
0x56556bae <+41>:     push    %ecx
0x56556baf <+42>:     push    0x4(%edx)
0x56556bb2 <+45>:     call    0x56556b85 <fun7>
0x56556bb7 <+50>:     add     $0x10,%esp
0x56556bba <+53>:     add     %eax,%eax
0x56556bbc <+55>:     jmp     0x56556ba6 <fun7+33>
0x56556bbe <+57>:     sub     $0x8,%esp
0x56556bc1 <+60>:     push    %ecx
0x56556bc2 <+61>:     push    0x8(%edx)
0x56556bc5 <+64>:     call    0x56556b85 <fun7>
0x56556bca <+69>:     add     $0x10,%esp
0x56556bcd <+72>:     lea     0x1(%eax,%eax,1),%eax
0x56556bd1 <+76>:     jmp     0x56556ba6 <fun7+33>
0x56556bd3 <+78>:     mov     $0xffffffff,%eax
0x56556bd8 <+83>:     jmp     0x56556ba6 <fun7+33>

```

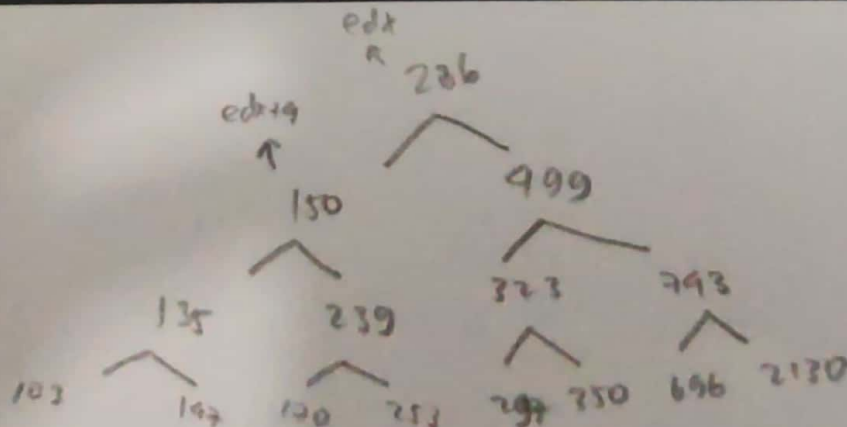
End of assembler dump.



→ edx = 0x10  
→ ecx = 147

→ ebx = 286 (n)  
→ comp 286 : 147

→ push 147  
→ push 150  
→ (n+1)  
delay



if (inp > \*p):  
 return 2 + fun7(child  
 heap, input + 1  
 )  
else if (inp < \*p):  
 return 2 + fun7  
 (childfun, input)