

## Task 1 rewritten

### 1. Screenshots for Task 1.

<pre>start:     mov ebx, 100000     mov eax, 0     add eax, ebx</pre>	<pre>C:\Users\eve\Desktop&gt;r4.exe the overflow occurred: sum(N) of this value can't be stored in 32bit C:\Users\eve\Desktop&gt;_</pre>
<pre>start:     mov ebx, 65536     mov eax, 0     add eax, ebx</pre>	<pre>Copyright (c) 2006 Microsoft Corporation. All right C:\Users\eve\Desktop&gt;r4.exe the overflow occurred: sum(N) of this value can't be stored in 32bit C:\Users\eve\Desktop&gt;_</pre>
<pre>start:     mov ebx, 65535     mov eax, 0     add eax, ebx</pre>	<pre>Microsoft Windows [Version 6.0.6001] Copyright (c) 2006 Microsoft Corporation. C:\Users\eve\Desktop&gt;r4.exe 2147450880 Gauss was right! C:\Users\eve\Desktop&gt;</pre>
<pre>start:     mov ebx, 12345     mov eax, 0     add eax, ebx</pre>	<pre>Copyright (c) 2006 Microsoft Corporation. C:\Users\eve\Desktop&gt;r4.exe 76205685 Gauss was right! C:\Users\eve\Desktop&gt;</pre>
<pre>start:     mov ebx, 999     mov eax, 0     add eax, ebx</pre>	<pre>Copyright (c) 2006 Microsoft Corporation. C:\Users\eve\Desktop&gt;r4.exe 499500 Gauss was right! C:\Users\eve\Desktop&gt;_</pre>
<pre>start:     mov ebx, 100     mov eax, 0     add eax, ebx</pre>	<pre>Microsoft Windows [Version 6.0.6001] Copyright (c) 2006 Microsoft Corporation. C:\Users\eve\Desktop&gt;r4.exe 5050 Gauss was right! C:\Users\eve\Desktop&gt;_</pre>
<pre>start:     mov ebx, 42     mov eax, 0     add eax, ebx</pre>	<pre>C:\Users\eve\Desktop&gt;r4.exe 903 Gauss was right! C:\Users\eve\Desktop&gt;</pre>
<pre>start:     mov ebx, 5     mov eax, 0     add eax, ebx</pre>	<pre>Microsoft Windows [Version 6.0.6001] Copyright (c) 2006 Microsoft Corporation. C:\Users\eve\Desktop&gt;r4.exe 15 Gauss was right! C:\Users\eve\Desktop&gt;_</pre>

<pre> start:     mov ebx, 0     mov eax, 0 </pre>	<pre> Copyright (c) 2000 Microsoft Corporation C:\Users\eve\Desktop&gt;r4.exe N must be greater than 0 </pre>
<pre> start:     mov ebx, -1     mov eax, 0     add eax, ebx </pre>	<pre> Copyright (c) 2000 Microsoft Corporation C:\Users\eve\Desktop&gt; C:\Users\eve\Desktop&gt;r4.exe N must be greater than 0 C:\Users\eve\Desktop&gt; </pre>

I also added comments on this task:

```

13  start:
14      mov ebx, 100          ; N = 100
15      mov eax, 0
16      add eax, ebx          ; i = N
17
18      mov ecx, 0
19      add ecx, ebx          ; j = N
20
21      mov edx, 0
22      add edx, ebx          ; k = N
23
24      cmp ebx, 0            ; if N <= 0: call warning, this won't have any reasonable fot this task result
25      jle warning0
26
27  sumN1:
28      dec ebx                ; N -= 1
29      add eax, ebx           ; i += N
30      cmp eax, 2147483647    ; if N > 65536, then sum(N) > 2147483647, it will cause overflow for signed registers
31      jo warning            ; so we compare i to 2147483647 to prevent overflow
32      cmp ebx, 0            ; if N != 0, loop must be processed again
33      jne sumN1             ; when N = 0, it means that i got sum(N)
34      mov ebx, eax          ; N = i; we need it because i (EAX), will be rewritten in further code
35
36  sumN2:
37      inc ecx                ; j += 1
38      mov eax, ecx           ; i = j
39      mul edx                ; i *= k
40
41      shr eax, 1             ; i /= 2, or shift EAX right by 1 bit
42      shl edx, 31            ; shift edx left by 31 bit
43      add eax, edx           ; ^^ this is basically division on 64-bit integer by 2
44
45      jo warning            ; call warning if overflow happens
46      cmp eax, ebx           ; if sumN1 = sumN2, task completed successfully
47      je end_sum
48      jne end_wrong
49
50  end_wrong:
51      print str$(edx), 13, 10, 0
52      print "What happened?.. Was Gauss wrong?.."
53      ret
54
55  end_sum:
56      print str$(eax), 13, 10, 0
57      print "Gauss was right!"
58      ret
59
60  warning:
61      print "the overflow ocured: ", 13, 10, 0
62      print "sum(N) of this value can't be stored in 32bit", 13, 10, 0
63      ret
64
65  warning0:
66      print "N must be greater than 0", 13, 10, 0
67      ret
68  END start

```