Subhan Khalid p200086 BSCS 4A



Tasks

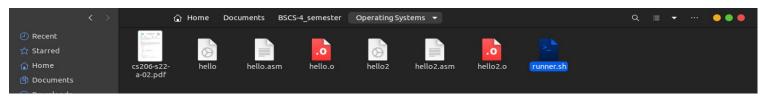
Task1

```
Visual Studio Code
                                                          hello.asm - Operating Systems - Visual Studio Code
File Edit Selection View Go Run Terminal Help
      № hello.asm × № hello2.asm
                                                                                                                                                        ▷ □ …
       ASM hello.asm
            section .data
            hello: db '.'
            helloLen: equ $-hello
            global _start
       10
            _start:
            mov ecx, 500000
       12
       13
            11:
        14
        15
                mov esi, ecx
        16
                mov eax, 4
                mov ebx, 1
               mov ecx, hello
        19
               mov edx, helloLen
        20
               int 80h
       21
       22
                mov ecx, esi
       23
       24
            loop l1
            mov ebx, 0
            int 80h
```

Task2

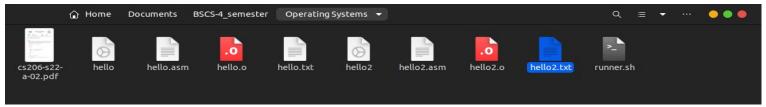
```
☑ Visual Studio Code
                                                             hello2.asm - Operating Systems - Visual Studio Code
File Edit Selection View Go Run Terminal Help
      hello.asm
                     № hello2.asm ×
                                                                                                                                                                ▷ □ …
       ASM hello2.asm
             section .data
             hello dh ' '
             helloLen: equ $-hello
              section .text
             global _start
             _start:
        11
             mov ecx, 500000
        13
        15
                  mov ebx, ecx
        16
                  mov rdi. 1
                  mov rsi, hello
        18
                  mov rdx, helloLen
        20
                 mov rax. 1
        21
                 syscall
        23
                 mov ecx, ebx
        25
             loop l1
        27
             mov rdi, 0
              mov rax. 60
              syscall
                                                                                                                        Ln 30, Col 8 Spaces: 4 UTF-8 LF Assembly (TASM) 후
```

abdul@abdul-HP-EliteBook-840-G4:~/Documents/BSCS-4_semester/Operating Systems\$ nasm -f elf64 -o hello.o hello.asm abdul@abdul-HP-EliteBook-840-G4:~/Documents/BSCS-4_semester/Operating Systems\$ nasm -f elf64 -o hello2.o hello2.asm abdul@abdul-HP-EliteBook-840-G4:~/Documents/BSCS-4_semester/Operating Systems\$ ld -s -o hello hello.o abdul@abdul-HP-EliteBook-840-G4:~/Documents/BSCS-4_semester/Operating Systems\$ ld -s -o hello2 hello2.o



abdul@abdul-HP-EliteBook-840-G4:~/Documents/BSCS-4_semester/Operating Systems\$ chmod +x runner.sh abdul@abdul-HP-EliteBook-840-G4:~/Documents/BSCS-4_semester/Operating Systems\$./runner.sh

hello.txt & hello2.txt → files created



Text files

Open ▼	+	hello2.txt	Save ··· •	Open ▼	+	hello.txt	Save	• (• •
1				1		~/Documents/BSCS-4_semester/Operating Systems			
2 real	0m0.323s			2 real	0m0.443s				
3 user	0m0.170s 0m0.153s			3 user	0m0.254s 0m0.190s				
4 sys 5	0110.1555			4 sys 5	נטפו. טויוט				
6 real	0m0.303s			6 real	0m0.431s				
7 user	0m0.166s			7 user	0m0.210s				
8 sys 9	0m0.137s			8 sys 9	0m0.221s				
10 real	0m0.319s			10 real	0m0.432s				
11 user	0m0.182s			11 user	0m0.232s				
12 sys 13	0m0.138s			12 sys 13	0m0.200s				
14 real	0m0.317s			14 real	0m0.421s				
15 user	0m0.228s			15 user	0m0.232s				
16 sys 17	0m0.088s			16 sys 17	0m0.187s				
18 real	0m0.316s			18 real	0m0.422s				
19 user	0m0.168s			19 user	0m0.245s				
20 sys 21	0m0.148s			20 sys 21	0m0.177s				
22 real	0m0.308s			22 real	0m0.431s				
23 user	0m0.200s			23 user	0m0.280s				
24 sys 25	0m0.108s			24 sys 25	0m0.152s				
26 real	0m0.321s			26 real	0m0.431s				
27 user	0m0.184s			27 user	0m0.264s				
28 sys 29	0m0.136s			28 sys 29	0m0.168s				
30 real	0m0.313s			30 real	0m0.416s				
31 user	0m0.197s			31 user	0m0.268s				
32 sys 33	0m0.116s			32 sys 33	0m0.148s				
34 real	0m0.315s			34 real	0m0.419s				
35 user	0m0.196s			35 user	0m0.232s				
36 sys 37	0m0.120s			36 sys 37	0m0.187s				
38 real	0m0.310s			38 real	0m0.420s				
39 user	0m0.175s			39 user	0m0.244s				
40 sys 41	0m0.135s			40 sys 41	0m0.176s				
42 real	0m0.312s			42 real	0m0.425s				1
43 user	0m0.196s			43 user	0m0.239s				
44 sys 45	0m0.116s			44 sys 45	0m0.187s				
46 real	0m0.321s			46 real	0m0.422s				
47 user	0m0.241s			47 user	0m0.258s				
48 sys 49	0m0.080s			48 sys 49	0m0.163s				
50 real	0m0.319s			50 real	0m0.420s				
51 user	0m0.188s			51 user 52 sys	0m0.212s 0m0.208s				
52 sys 53	0m0.131s			52 Sys	0M0.2005				
54 real	0m0.308s			54 real	0m0.430s				
55 user	0m0.148s			55 user 56 sys	0m0.259s 0m0.171s				
56 sys 57	0m0.160s			50 sys	0110.1715				
58 real	0m0.318s			58 real	0m0.428s				
59 user	0m0.185s			59 user 60 sys	0m0.268s 0m0.160s				
60 sys 61	0m0.133s			61	0110.1005				
62 real	0m0.332s			62 real	0m0.424s				
63 user	0m0.168s			63 user 64 sys	0m0.243s 0m0.179s				
64 sys 65	0m0.163s			65 65					
66 real	0m0.317s			66 real	0m0.419s				
67 user	0m0.153s			67 user 68 sys	0m0.200s 0m0.219s				
68 sys 69	0m0.164s			69	011012173				
70 real	0m0.319s			70 real	0m0.419s				
71 user	0m0.180s			71 user 72 sys	0m0.256s 0m0.164s				
72 sys	0m0.139s			. 2 3 9 3	0.1011073				

72 sys 73			
	0m0.139s	72 sys	0m0.164s
		73	
74 real	0m0.313s	74 real	0m0.426s
75 user	0m0.178s	75 user	0m0.245s
76 sys	0m0.134s	76 sys	0m0.181s
77 77	010.1343	77	
78 real	0m0.318s	78 real	0m0.423s
79 user	0m0.165s	79 user	0m0.247s
	0m0.150s	80 sys	0m0.175s
80 sys 81	טויוט. ביינו פורט. ביינו פורט פיינו פורט פיינו פורט פיינו	81	3.13.12.12.2
	0=0 314=	82 real	0m0.417s
82 real	0m0.314s	83 user	0m0.245s
83 user	0m0.149s	84 sys	0m0.172s
84 sys	0m0.165s	85	0.10.1723
85		86 real	0m0.421s
86 real	0m0.313s	87 user	0m0.197s
87 user	0m0.168s		
88 sys	0m0.144s	88 sys 89	0m0.224s
89			0-0 422-
90 real	0m0.314s	90 real	0m0.423s
91 user	0m0.191s	91 user	0m0.255s
92 sys	0m0.123s	92 sys	0m0.166s
93		93	
94 real	0m0.320s	94 real	0m0.420s
95 user	0m0.191s	95 user	0m0.232s
96 sys	0m0.127s	96 sys	0m0.188s
97		97	
98 real	0m0.321s	98 real	0m0.418s
99 user	0m0.185s	99 user	0m0.241s
100 sys	0m0.136s	100 sys	0m0.177s
101	0.10.1303	101	
102 real	0m0.317s	102 real	0m0.476s
103 user	0m0.181s	103 user	0m0.260s
	0m0.136s	104 sys	0m0.216s
104 sys 105	0H0.130S	105	
105 106 real	0m0.326s	106 real	0m0.440s
100 reat	UNU.320S		
106 real	0m0.326s	106 real	0m0.440s
106 real 107 user	0m0.326s 0m0.217s	107 user	0m0.236s
107 user		107 user 108 sys	
	0m0.217s	107 user 108 sys 109	0m0.236s 0m0.204s
107 user 108 sys 109	On0.217s On0.108s	107 user 108 sys 109 110 real	0m0.236s 0m0.204s 0m0.464s
107 user 108 sys 109 110 real	0n0.217s 0n0.108s 0n0.335s	107 user 108 sys 109	0m0.236s 0m0.204s
107 user 108 sys 109 110 real 111 user	0n0.217s 0n0.108s 0n0.335s 0n0.171s	107 user 108 sys 109 110 real	0m0.236s 0m0.204s 0m0.464s
107 user 108 sys 109 110 real 111 user 112 sys	0n0.217s 0n0.108s 0n0.335s	107 user 108 sys 109 110 real 111 user	0m0.236s 0m0.204s 0m0.464s 0m0.296s
107 user 108 sys 109 110 real 111 user 112 sys 113	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s	107 user 108 sys 109 110 real 111 user 112 sys	0m0.236s 0m0.204s 0m0.464s 0m0.296s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s	107 user 108 sys 109 110 real 111 user 112 sys 113	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.319s 0m0.193s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117	0n0.217s 0n0.108s 0m0.335s 0n0.171s 0n0.163s 0m0.319s 0n0.193s 0m0.125s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.193s 0m0.193s 0m0.125s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.248s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.351s 0m0.217s 0m0.133s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.248s 0m0.219s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.217s 0m0.31s 0m0.31s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 121	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.2248s 0m0.219s 0m0.433s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user	0m0.217s 0m0.108s 0m0.35s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.351s 0m0.217s 0m0.217s 0m0.336s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.248s 0m0.249s 0m0.219s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.217s 0m0.31s 0m0.31s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.2248s 0m0.219s 0m0.433s
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107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real	0m0.217s 0m0.108s 0m0.35s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.351s 0m0.217s 0m0.33s 0m0.346s 0m0.191s 0m0.155s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 128 real	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.248s 0m0.249s 0m0.219s 0m0.433s 0m0.249s 0m0.184s 0m0.249s
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107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys	0m0.217s 0m0.108s 0m0.35s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.351s 0m0.217s 0m0.33s 0m0.346s 0m0.191s 0m0.155s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.248s 0m0.249s 0m0.219s 0m0.433s 0m0.249s 0m0.184s 0m0.249s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 127 user 128 sys 129	0m0.217s 0m0.108s 0m0.315s 0m0.163s 0m0.193s 0m0.193s 0m0.125s 0m0.351s 0m0.217s 0m0.33s 0m0.133s 0m0.135s 0m0.135s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 real 129 user 121 user 122 user 123 user 124 sys 125 126 real 127 user 128 sys 129 user 129 sys 121	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.248s 0m0.249s 0m0.184s 0m0.249s 0m0.184s 0m0.249s 0m0.184s
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107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user	0m0.217s 0m0.108s 0m0.315s 0m0.163s 0m0.193s 0m0.193s 0m0.125s 0m0.351s 0m0.217s 0m0.33s 0m0.133s 0m0.135s 0m0.135s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 129 user 121 user 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.248s 0m0.219s 0m0.184s 0m0.229s 0m0.184s 0m0.227s 0m0.30s 0m0.430s 0m0.239s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 129 real 129 user 121 user 122 sys 123 user 124 sys 125 real 127 user 128 sys 129 129 real 129 user 121 user 122 real 123 user 124 sys 125 real 127 user 128 sys 129 130 real 131 user 132 sys	0m0.217s 0m0.108s 0m0.35s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.217s 0m0.31s 0m0.31s 0m0.31s 0m0.33s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 real 129 user 121 user 122 user 123 user 124 sys 125 127 user 128 real 129 real 129 real 129 real 121 user 122 user 123 user 124 sys 125 127 user 128 real 129 user 129 user 121 user 122 user 123 user 124 user 125 user 127 user 128 real 129 real 129 real 129 real 129 real 129 real 129 real 121 user 128 sys 129 real 129 user 129 user 129 user 129 user 129 user 129 user 121 user 122 user 123 user 124 user 125 user 127 user 128 user 129 user 129 user 129 user 129 user 120 sys 121 user 122 user 123 user 124 user 125 user 127 user 128 user 129 user 129 user 129 user 129 user 129 user 129 user 129 user 129 user 130 user 131 user	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.248s 0m0.219s 0m0.433s 0m0.219s 0m0.433s 0m0.22s 0m0.217s 0m0.422s 0m0.217s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 129 user 121 sys 129 user 121 sys 122 sys 123 user 124 sys 125 user 127 user 128 sys 129 real 131 user 132 sys 133 user 133 user	0m0.217s 0m0.108s 0m0.35s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.351s 0m0.217s 0m0.33s 0m0.117s 0m0.133s 0m0.155s 0m0.346s 0m0.191s 0m0.155s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 120 sys 121 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 129 sys 129 sys 129 sys 129 sys 121 127 user 128 sys 129 sys 129 sys 129 sys 129 sys 129 sys 121 ser 121 sys 122 real 123 user 124 sys 125 sys 127 user 128 sys 129 sys 129 sys 129 sys 129 sys 129 sys 129 sys 121 ser 127 user 128 sys 129 sys 130 real 131 user 132 sys 133 sys	omo.236s omo.204s omo.464s omo.296s omo.168s omo.242s omo.193s omo.48s omo.242s omo.219s omo.219s omo.184s omo.229s omo.217s omo.184s omo.225s omo.217s omo.239s omo.239s omo.239s omo.239s omo.239s omo.239s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 132 sys 131 ser 132 sys 133 real	0m0.217s 0m0.108s 0m0.35s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.351s 0m0.217s 0m0.33s 0m0.117s 0m0.133s 0m0.155s 0m0.346s 0m0.191s 0m0.155s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 131 user 132 sys 133 134 real	omo.236s omo.204s omo.464s omo.296s omo.168s omo.242s omo.193s omo.468s omo.248s omo.248s omo.219s omo.184s omo.249s omo.184s omo.271s omo.400s omo.400s omo.400s omo.400s omo.400s omo.400s omo.400s omo.400s omo.417s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 129 user 121 sys 129 user 121 sys 122 sys 123 user 124 sys 125 user 127 user 128 sys 129 real 131 user 132 sys 133 user 133 user	0m0.217s 0m0.108s 0m0.35s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.217s 0m0.217s 0m0.33s 0m0.346s 0m0.191s 0m0.155s 0m0.327s 0m0.327s 0m0.327s 0m0.338s 0m0.327s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 132 sys 131 user 132 sys 131 user 132 sys 131 user 132 sys 133 user 134 real 135 user	0m0.236s 0m0.204s 0m0.464s 0m0.296s 0m0.168s 0m0.434s 0m0.242s 0m0.193s 0m0.468s 0m0.248s 0m0.248s 0m0.219s 0m0.1184s 0m0.249s 0m0.184s 0m0.205s 0m0.217s 0m0.430s 0m0.227s 0m0.430s 0m0.217s 0m0.430s 0m0.217s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 132 user 131 user 132 user 133 user 134 user 135 user 135 user	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.217s 0m0.331s 0m0.217s 0m0.133s 0m0.191s 0m0.155s 0m0.155s 0m0.97s 0m0.327s 0m0.38s 0m0.186s 0m0.186s 0m0.186s 0m0.186s 0m0.182s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 132 sys 133 134 real 135 user 136 sys	omo.236s omo.204s omo.464s omo.296s omo.168s omo.242s omo.193s omo.468s omo.248s omo.248s omo.219s omo.184s omo.249s omo.184s omo.271s omo.400s omo.400s omo.400s omo.400s omo.400s omo.400s omo.400s omo.400s omo.417s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 129 user 121 sys 129 user 121 sys 129 user 121 sys 129 user 129 sys 129 user 121 sys 129 user 131 user 132 user 132 user 133 user 134 real 135 user 136 sys	0m0.217s 0m0.108s 0m0.35s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.217s 0m0.217s 0m0.33s 0m0.346s 0m0.191s 0m0.155s 0m0.327s 0m0.327s 0m0.327s 0m0.338s 0m0.327s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 132 user 132 user 134 real 135 user 136 sys 137	omo.236s omo.204s omo.464s omo.464s omo.168s omo.168s omo.242s omo.193s omo.468s omo.248s omo.249s omo.219s omo.184s omo.249s omo.184s omo.22s omo.184s omo.205s omo.217s omo.430s omo.239s omo.191s omo.417s omo.417s omo.216s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 132 sys 131 user 132 sys 133 real 134 real 135 user 136 sys 137	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.321s 0m0.217s 0m0.133s 0m0.346s 0m0.191s 0m0.155s 0m0.327s 0m0.327s 0m0.338s 0m0.186s 0m0.186s 0m0.130s 0m0.327s 0m0.318s 0m0.186s 0m0.130s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 129 user 121 user 128 sys 129 120 sys 121 user 123 user 124 sys 125 126 real 127 user 127 user 128 sys 129 130 real 131 user 132 user 132 sys 133 real 135 user 136 sys 137 user 138 real 137 user 138 real 138 real	omo.236s omo.204s omo.464s omo.296s omo.168s omo.168s omo.242s omo.193s omo.468s omo.248s omo.219s omo.433s omo.249s omo.184s omo.217s omo.184s omo.217s omo.217s omo.217s omo.217s omo.216s omo.216s omo.216s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 132 sys 133 real 134 real 135 user 136 sys 137 real 138 real	0n0.217s 0n0.108s 0m0.315s 0n0.171s 0n0.163s 0m0.319s 0m0.193s 0n0.125s 0m0.351s 0m0.217s 0m0.33s 0m0.133s 0m0.346s 0m0.191s 0m0.155s 0m0.327s 0m0.230s 0m0.97s 0m0.318s 0m0.186s 0m0.186s 0m0.130s 0m0.327s 0m0.327s 0m0.327s 0m0.318s 0m0.186s 0m0.130s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 132 user 132 user 134 real 135 user 136 sys 137	omo.236s omo.204s omo.464s omo.464s omo.168s omo.168s omo.242s omo.193s omo.468s omo.248s omo.249s omo.219s omo.184s omo.249s omo.184s omo.22s omo.184s omo.205s omo.217s omo.430s omo.239s omo.191s omo.417s omo.417s omo.216s
107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 130 real 131 user 132 sys 131 user 132 sys 133 real 134 real 135 user 136 sys 137	0m0.217s 0m0.108s 0m0.335s 0m0.171s 0m0.163s 0m0.319s 0m0.193s 0m0.125s 0m0.321s 0m0.217s 0m0.133s 0m0.346s 0m0.191s 0m0.155s 0m0.327s 0m0.327s 0m0.338s 0m0.186s 0m0.186s 0m0.130s 0m0.327s 0m0.318s 0m0.186s 0m0.130s	107 user 108 sys 109 110 real 111 user 112 sys 113 114 real 115 user 116 sys 117 118 real 119 user 120 sys 121 122 real 123 user 124 sys 125 126 real 127 user 128 sys 129 129 user 121 user 128 sys 129 120 sys 121 user 123 user 124 sys 125 126 real 127 user 127 user 128 sys 129 130 real 131 user 132 user 132 sys 133 real 135 user 136 sys 137 user 138 real 137 user 138 real 138 real	omo.236s omo.204s omo.464s omo.296s omo.168s omo.168s omo.242s omo.193s omo.468s omo.248s omo.219s omo.433s omo.249s omo.184s omo.217s omo.184s omo.217s omo.217s omo.217s omo.217s omo.216s omo.216s omo.216s

		1421	0=0.444=
142 real	0m0.323s	142 real	0m0.441s
143 user	0m0.167s	143 user	0m0.226s
144 sys	0m0.155s	144 sys	0m0.214s
145		145	
146 real	0m0.326s	146 real	0m0.428s
147 user	0m0.189s	147 user	0m0.250s
148 sys	0m0.136s	148 sys	0m0.178s
149		149	
150 real	0m0.322s	150 real	0m0.423s
151 user	0m0.182s	151 user	0m0.250s
152 sys	0m0.141s	152 sys	0m0.173s
153		153	
154 real	0m0.321s	154 real	0m0.421s
155 user	0m0.198s	155 user	0m0.248s
156 sys	0m0.123s	156 sys	0m0.172s
157		157	
158 real	0m0.308s	158 real	0m0.422s
159 user	0m0.200s	159 user	0m0.281s
160 sys	0m0.108s	160 sys	0m0.140s
161		161	
162 real	0m0.330s	162 real	0m0.462s
163 user	0m0.167s	163 user	0m0.265s
164 sys	0m0.163s	164 sys	0m0.197s
165		165	
166 real	0m0.349s	166 real	0m0.465s
167 user	0m0.208s	167 user	0m0.313s
168 sys	0m0.140s	168 sys	0m0.152s
169	011012105	169	
170 real	0m0.335s	170 real	0m0.430s
171 user	0m0.194s	171 user	0m0.259s
172 sys	0m0.141s	172 sys	0m0.171s
173	011012125	173	
174 real	0m0.322s	174 real	0m0.417s
175 user	0m0.199s	175 user	0m0.201s
176 eve	AmA 123c	176 sys	0m0.216s
174 real	0m0.322s	174 real	0m0.417s
175 user	0m0.199s	175 user	0m0.201s
176 sys	0m0.123s	176 sys	0m0.216s
177		177	
178 real	0m0.341s	178 real	0m0.467s
179 user	0m0.192s	179 user	0m0.224s
180 sys	0m0.149s	180 sys	0m0.244s
181		181	
182 real	0m0.334s	182 real	0m0.425s
183 user	0m0.185s	183 user	0m0.264s
184 sys 185	0m0.149s	184 sys 185	0m0.161s
185 186 real	0m0.345s	186 real	0m0.425s
187 user	0m0.177s	187 user	0m0.266s
188 sys	0m0.168s	188 sys	0m0.159s
189	010.1003	189	0110:1373
190 real	0m0.310s	190 real	0m0.424s
191 user	0m0.209s	191 user	0m0.218s
192 sys	0m0.100s	192 sys	0m0.206s
193		193	
194 real	0m0.313s	194 real	0m0.416s
195 user	0m0.177s	195 user	0m0.232s
196 sys	0m0.136s	196 sys	0m0.184s
197		197	
198 real	0m0.315s	198 real	0m0.414s
199 user	0m0.179s	199 user	0m0.271s
200 sys	0m0.135s	200 sys	0m0.143s
		_	

Average of the user time taken across the 50 experiments. Avg \rightarrow hello.txt

0.253+0.280+0.251+0.224+0.220+0.247+0.236+0.241+0.271+0.224+0.210+0.238+0 = 12.139							
12.139÷50					0.24278		
0.24278							
7	8	9		5	С		
4	5	6	×	()		
1	2	3	-	x ²	✓		
0		%	+		=		

Avg → hello2.txt

0.323+0.166+0.182+0.228+0.168+0.200+0.184+0.197+0.196+0.175+0.196+0.241+0 = 9.524							
9.524÷50			0.19048				
0.19048	0.19048						
7	8	9	÷	5	С		
4	5	6		(
1	2	3		x ²	✓		
0		%	+		=		

Number of experiments run:

Average 'user time' for hello (int-based calls):

I Average 'user time' for hello2 (syscall-based calls): S

Percentage speedup: (I-S)*100/I

N = 50I = 0.24278

S = 0.19048

percentage = 21.542136914

0.24278-0.19048	=	0.0523
0.0523×100	=	5.23
5.23÷0.24278	=	21.54213