

# CPU Instructions

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## A simple C program

```
typedef unsigned int uint;

uint f(uint n)
{
    uint s = 0;
    for (uint i = 1; i <= n; i += 3)
        s += i;
    return s;
}
```

# Translation by GCC

```
0: 85 ff      test  %edi,%edi    %edi = input parameter n
2: 74 1c      je    20
4: b8 01 00 00 00  mov  $0x1,%eax    %eax = i (loop variable)
9: 45 31 c0   xor   %r8d,%r8d   %r8d = s (running sum)
c: 0f 1f 40 00  nopl  0x0(%rax)
10: 41 01 c0   add   %eax,%r8d
13: 83 c0 03   add   $0x3,%eax
16: 39 c7      cmp   %eax,%edi
18: 73 f6      jae  10
1a: 44 89 c0   mov   %r8d,%eax   %eax = return value
1d: c3        retq
1e: 66 90     xchg  %ax,%ax
20: 45 31 c0   xor   %r8d,%r8d   special case for n=0
23: 44 89 c0   mov   %r8d,%eax
26: c3        retq
```