```c
1  //
2  // Created by hfwei on 2023/11/30.
3  // Visualization:https://pythontutor.com/render.html#code=//%0A//%
   20Created%20by%20hfwei%20on%202023/11/30.%0A//%0A%0A%23include%20%
   3Cstdio.h%3E%0A%0Aint%20main%28void%29%20%7B%0A%20%20char%20msg%5B%5D%
   20%3D%20%22Hello%20World!%22%3B%0A%20%20printf%28%22%25s%5Cn%22,%20msg
   %29%3B%0A%0A%20%20msg%5B0%5D%20%3D%20'N'%3B%0A%20%20printf%28%22%25s%
   5Cn%22,%20msg%29%3B%0A%0A%20%20//%20string%20literal%3B%0A%20%20//%
   20may%20be%20stored%20in%20read-only%20memory%0A%20%20char%20*ptr_msg%
   20%3D%20%22Hello%20World!%22%3B%0A%0A%20%20//%20undefined%20behavior%
   0A%0A%20%20//%20On%20Linux%20%28or%20Debug%20mode%20on%20Windows%29%3A
   %20interrupted%20by%20signal%2011%3A%20SIGSEGV%0A%20%20//%20SIG%3A%
   20signal%3B%20SEGV%3A%20segmentation%20violation%0A%0A%20%20//%20On%
   20Windows%3A%20Process%20finished%20with%20exit%20code%20-1073741819%
   20%280xC0000005%29%0A%20%20//%20See%20https%3A//learn.microsoft.com/en
   -us/openspecs/windows_protocols/ms-erref/596a1078-e883-4972-9bbc-
   49e60bebca55%0A%20%20ptr_msg%5B0%5D%20%3D%20'N'%3B%0A%20%20printf%28%
   22%25s%5Cn%22,%20msg%29%3B%0A%0A%20%20return%200%3B%0A%7D&
   cppShowMemAddrs=true&cumulative=true&curInstr=7&heapPrimitives=
   nevernest&mode=display&origin=opt-frontend.js&py=c_gcc9.3.0&
   rawInputLstJSON=%5B%5D&textReferences=false
4  // See String literals: https://en.cppreference.com/w/c/language/
   string_literal
5  //
6
7  #include <stdio.h>
8  #include <stdlib.h>
9
10 int main(void) {
11   // it is actually char msg[] = { 'H', 'e', ..., '\0' };
12   char msg[] = "Hello World!";
13   printf("%s\n", msg);
14
15   // array name is read-only
16   // msg = "Hello";
17
18   msg[0] = 'N';
19   printf("%s\n", msg);
20
21   // string literal;
22   // may be stored in read-only memory
23   char *ptr_msg = "Hello World!";
24
25   // undefined behavior
26
27   // On Linux (or Debug mode on Windows): interrupted by signal 11:
   SIGSEGV
28   // SIG: signal; SEGV: segmentation violation
29
30   // On Windows: Process finished with exit code -1073741819 (
   0xC0000005)
31   // See https://learn.microsoft.com/en-us/openspecs/windows_protocols
   /ms-erref/596a1078-e883-4972-9bbc-49e60bebca55
```

```c
32    ptr_msg[0] = 'N';
33    printf("%s\n", msg);
34
35    // using malloc
36    char *malloc_msg = malloc(20);
37    malloc_msg = "Hello World!";
38    malloc_msg[0] = 'N';
39
40    return 0;
41 }
```