第二次 Vidar-Team 新生培训



逐数



```
定义:
返回类型 名字(参数列表)
声明:
返回类型 名字(参数列表);
```



```
main函数
```

```
C11 标准:
程序开始
    int main(void) { /* ... */ }
    Or
    int main(int argc, char *argv[]) { /* ... */ }
退出
    return or call exit
```



```
#include <stdio.h>
       int max(int /*a*/, int /*b*/);
 3
      □int main()
            printf("%d\n", max(1, 2));
6
            return 0;
8
      □int max(int a, int b)
9
10
            return a > b ? a : b;
11
```



作用域

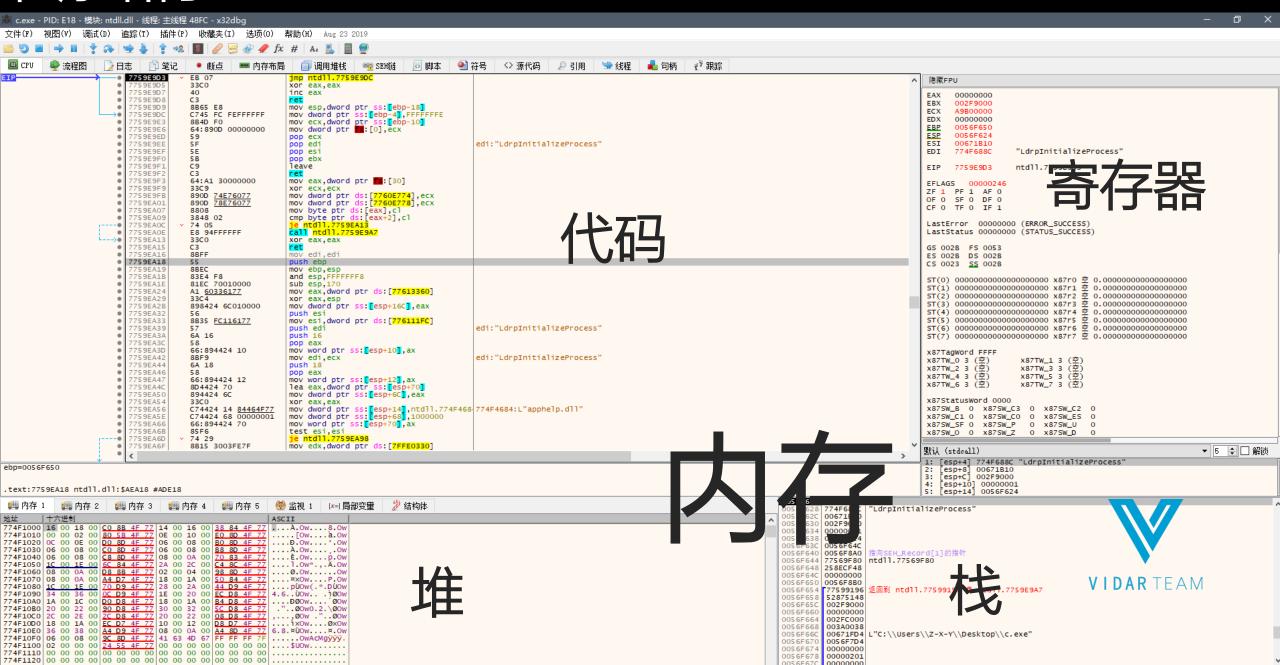
这段函数能否完成交换?



```
#include <stdio.h>
          int max(int /*a*/, int /*b*/);
 3
          void swap(int a, int b);
 4
        □int main()
                int a1 = 1, a2 = 2;
                swap(a1, a2);
                printf("a1 is: %d a2 is: %d \n", a1, a2);
                return 0;
                                               Microsoft Visual Studio Debug Console
                                               a1 is: 1 a2 is: 2
10
                                               D:\tmp\vidar2\Debug\vidar2.exe (process 4304)
                                               To automatically close the console when debugg
11
        □void swap(int a, int b)
                                               le when debugging stops.
                                               Press any key to close this window . . .
12
13
                int c = a;
14
                a = b;
15
                                                                       VIDARTEAM
                b = c;
16
```

(Global Scope)

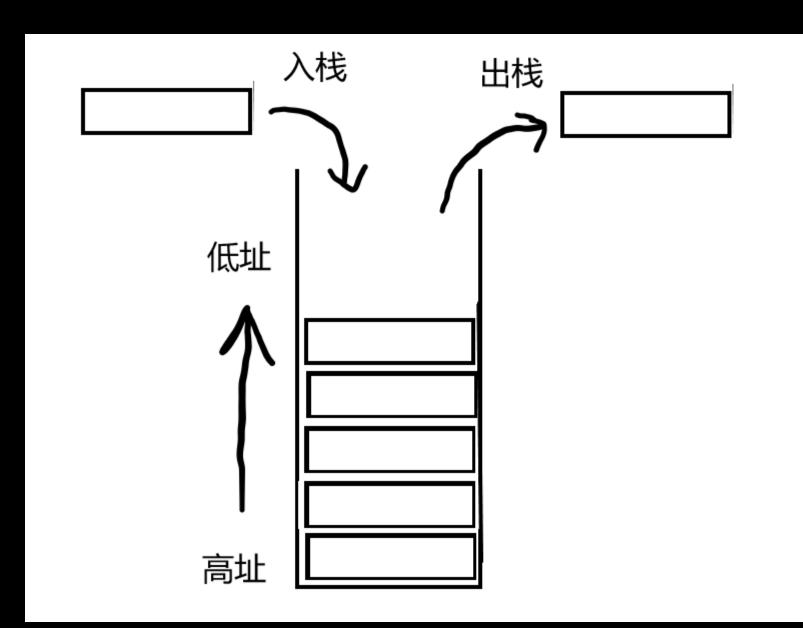
程序结构



栈 (stack)

倒序增长 后进先出 FILO (First In Last Out)







当调用一个函数时

```
#include <stdio.h>
将返回地址入栈
                    int max(int /*a*/, int /*b*/);
跳到函数去执行
                  □int main()
 将第六行地址入栈调用printf
                       printf("%d\n", max(1, 2));
 然后返回到第六号继续执行
                       return 0;
                  □int max(int a, int b)
              8
                       return a > b ? a : b;
             10
             11
```

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递归





```
#include <stdio.h>
 2
        int add(unsigned int num);
 3
      ⊟int main()
 4
                                          add (1)
 5
             printf("%d\n", ac
 6
      □int add(unsigned int
                                          add (4)
 8
9
             if (num > 1)
                                          add (5)
                  return num +
10
                                          main函数
11
             else
12
                  return 1;
                                                 VIDARTEAM
13
```

栈地址不是无限的

```
#include <stdio.h>
 int add(unsigned int num);
□int main()
      printf("%d\n", add(~0ul));
□int add(unsigned int num)
      if (num > 1)
                                        VIDARTEAM
          return num + add(num - 1);
```

```
#include <stdio.h>
 int add(unsigned int num);
□int main()
      printf("%d\n", add(~0ul));

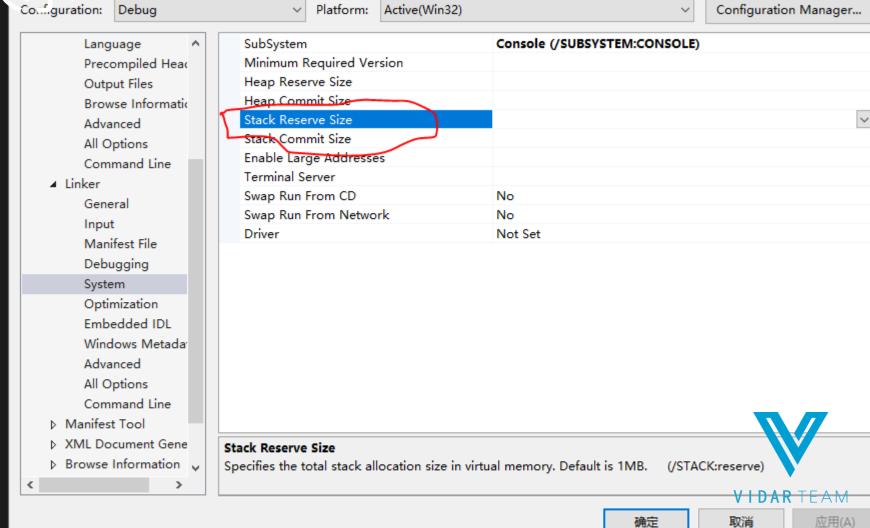
☐int add(unsigned int num)

       f (num > 1)
     Exception Unhandled
      Unhandled exception at 0x005719B9 in vidar2.exe: 0xC00000FD:
      Stack overflow (parameters: 0x00000001, 0x00802FA8).
      Copy Details
      b Exception Settings
```

不要使用可变数组







递归的优点

·简洁

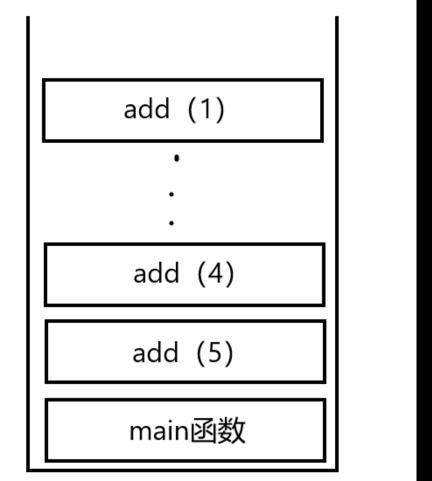
·把复杂问题简单化



递归的缺点

·占用内存多

·效率较低





```
inline
#include <stdio.h>
                               #include <stdio.h>
        inline int pf();
                              □int main()
      □int main()
                                  printf("from inline\n");
          int i=pf();
                                  int i=0;
          printf("%d", i);
                                  printf("%d", i);
      □inline int pf()
 8
          printf("from inline\n");
10
11
          return 0;
                                                   VIDARTEAN
12
```





#define num 1 printf("%d", num);

```
#include <stdio.h>
  #define add(a,b) a+b
⊟int main()
         printf("%d", add(1,2)*3);
         return 0;
     Microsoft Visual Studio Debug Console
     D:\tmp\vidar2\Debug\vidar2.exe (process 12488) exited with code 0.
```

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##

```
#include <stdio.h>
  #define add(a,b) (a##b)
□int main()
         printf("%d", add(1,2));
         return 0;
     Microsoft Visual Studio Debug Console
     D:\tmp\vidar2\Debug\vidar2.exe (process 11416) exited with code 0.
```

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类型



```
unsigned / signed char
unsigned / signed short (int)
   unsigned / signed int
unsigned / signed long (int)
unsigned/ signed long long
            (int)
            float
          double
        double long
```



sizeof(type)

编译时确定



数组和字符串

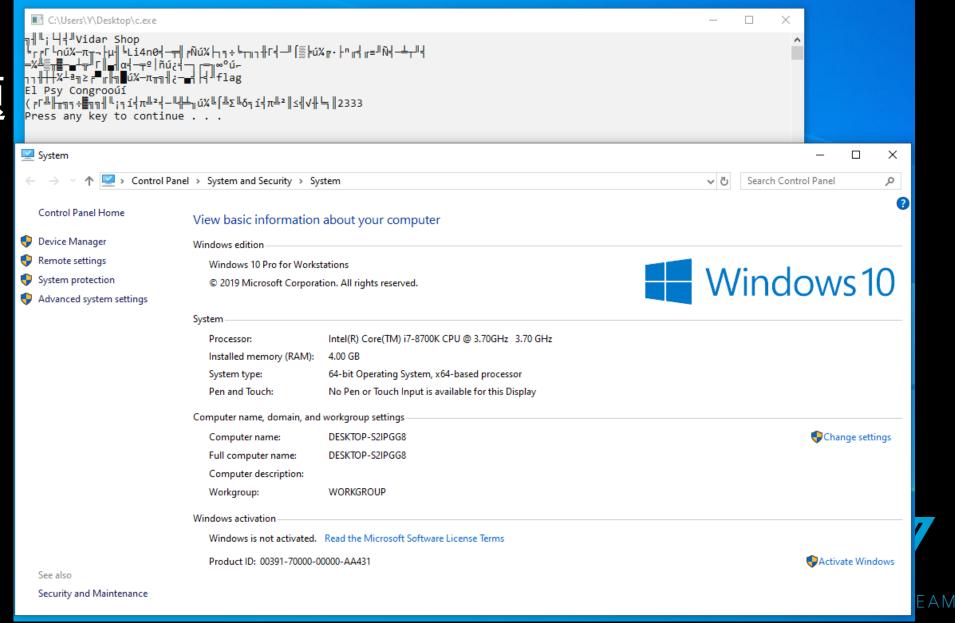


```
□int main()
       char a[0x100];
       for (int i = 1; i <= 0xff; ++i)
            a[i-1] = i;
       a[0xff] = 0;
       printf("%s", a);
       return 0;
    Microsoft Visual Studio Debug Console
                                                        VIDARTEAM
       D:\tmp\vidar2\x64\Debug\vidar2.exe (process 4920) exited with code 0
```

ASCII编码



中文问题



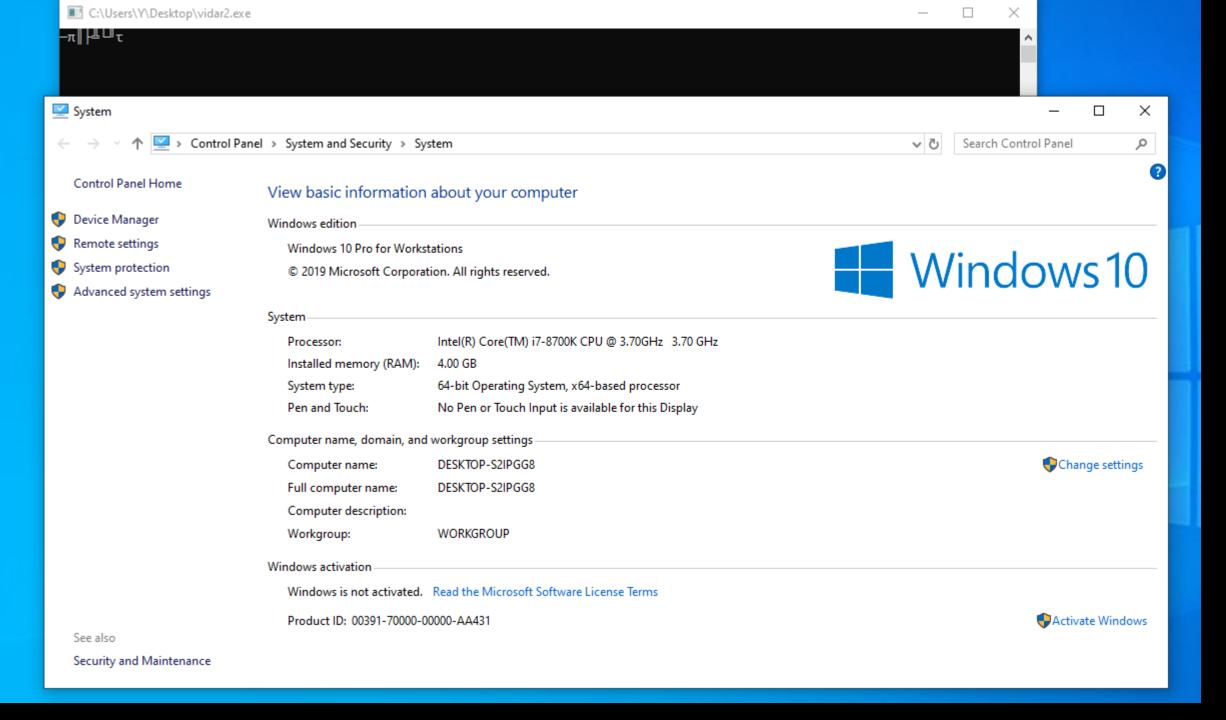
为什么

程序输出

```
二进制->编码对于字符串
中文->二进制
□#include <stdio.h>
  #include <Windows.h>
 ⊟int main()
     //SetConsoleOutputCP(936);
     printf("你好世界\n");
     getchar();
     return 0;
```

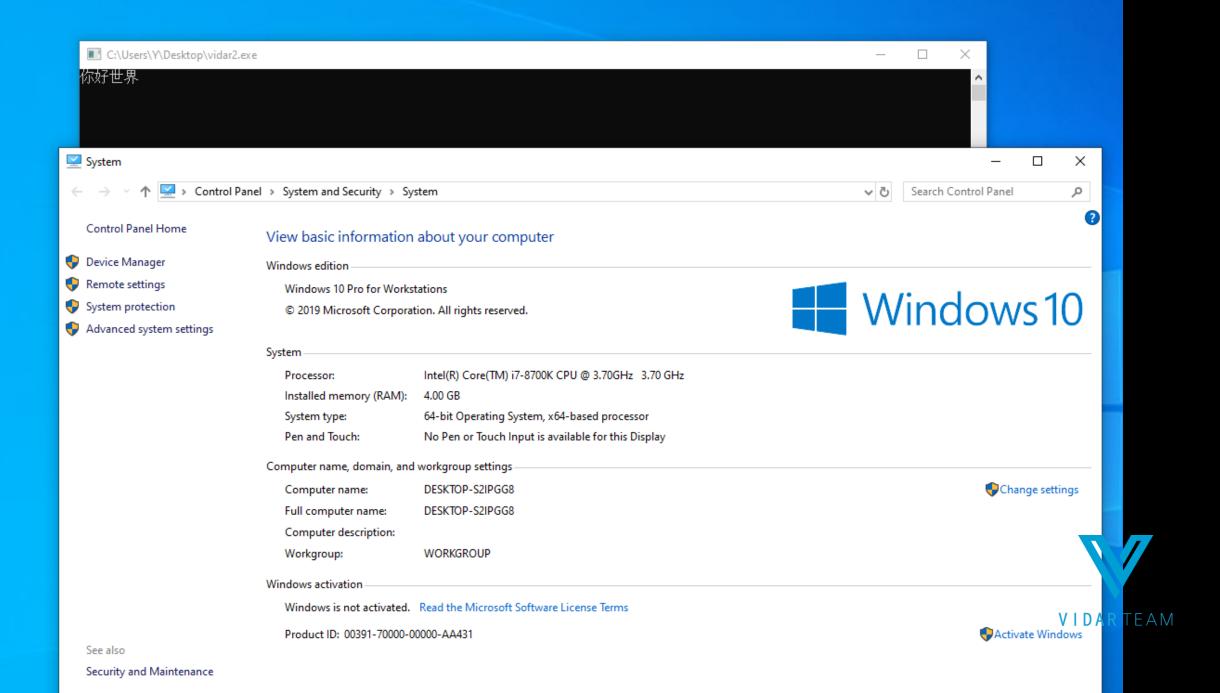
操作系统打印字符





设置控制台编码

```
□#include <stdio.h>
 #include <Windows.h>
⊟int main()
       SetConsoleOutputCP(936);
       printf("你好世界\n");
       getchar();
       return 0;
                        ANSI/OEM Simplified Chinese (PRC, Singapore); VIDAR TEAM
      936
             gb2312
                        Chinese Simplified (GB2312)
```



ASCII编码 只有英文 char只有一个字节 发生了什么



```
char bbb[6];
                                  memcpy(bbb, "卧槽", sizeof("卧槽"));
                                  printf(bbb);
       10
       11
                                  return 0;
                            Z] 国标码查询;汉字国家标准编码: X
       12
                                    a qqxiuzi.cn/bianma/guobiaoma.php
                                               看雪安全论坛 - ww... 🚇 Download music,... 🜖 UnKnoWnCheaTs... 🚺
                                 Google Translate
                                                                                                   CM 塞爱维(CIV)文明联... % r00tk
                                                                                       323万个编程源码...
                           千千秀字
                                                                                汉字国标码查询
                                               输入: 国标码▼
                                                                                               ■ D:\tmp\vidar2\Debug\vidar2.exe
                                                ced4
                                               查询
                      Value
                      0x00affe
                                               GB2312字符: GBK字符: GB18030字符: FI
[0x00000000]
                      0xce '?'
[0x00000001]
                      0xd4 '?'
[0x00000002]
                      0xb2 '?'
[0x00000003]
                      0xdb '?
[0x00000004]
                      0x00 '\0
                                               国标码是汉字的国家标准编码,目前主要有GB2312、GBK、GB18030三种。
[0x00000005]
                      0xcc '?'
ocals Watch 1
                                                 1. GB2312编码方案于1980年发布, 收录汉字6763个, 采用双字节编码。
                                                 2 GRK编码方案于1995年发布 - 收录汉字21003个 - 平田双字节编码
```

```
□#include <stdio.h>
           #include <wchar.h>
                                                     Wchar t
           #include <locale.h>
           #include <Windows.h>
                                                      ■ 选择Microsoft Visual Studio Debug Console
         ⊟int main()
                                                     D:\tmp\vidar2\Debug\vidar2.exe (process 120
                                                     To automatically close the console when deb
                                                     le when debugging stops.
                                                     Press any key to close this window . . .
                  int i = 1;
                  setlocale(LC ALL, "");
                  wchar_t aaa[3];
 9
                  wcscpy_s(aaa, L"卧槽");
10
                  wprintf(L"%s", aaa);
11
```

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解决方案2 -- utf-8

Unicode 和 UTF-8 之间的转换关系表 (x 字符表示码点占据的位)

码点的位 数	码点起值	码点终值	字节序列	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
7	U+0000	U+007F	1	0xxxxxxx					
11	U+0080	U+07FF	2	110xxxxx	10xxxxxx				
16	U+0800	U+FFFF	3	1110xxxx	10xxxxxx	10xxxxxx			
21	U+10000	U+1FFFFF	4	11110xxx	10xxxxxx	10xxxxxx	10xxxxxx		
26	U+200000	U+3FFFFF F	5	111110xx	10xxxxxx	10xxxxxx	10xxxxxx	10xxxxxx	
31	U+400000 0	U+7FFFFF FF	6	1111110x	10xxxxxx	10xxxxxx	10xxxxxx	10xxxxxx	10xxxxx

```
□#include <stdio.h>
       #include <wchar.h>
       #include <locale.h>
       #include <Windows.h>
     ⊟int main()
           SetConsoleOutputCP(65001);
           char bbb[100];
           memcpy(bbb, "卧槽",sizeof("卧槽"));
10
           printf(bbb);
           return 0;
```

```
#include <stdio.h>
       char a[11] = {"Vidar-Team"};
      □int main()
          if (a == "Vidar-Team")
            printf("yes\n");
          else
            printf("no\n");
          return 0;
10
                                     VIDARTEAM
```

```
char a[9] = { "Vidar-Team" };
a type?
char *
"Vidar-Team" type?
const char *
```



在内存中,a会放在哪个段上?

```
.data:004198B0 ?a@@3PADA db 'Vidar-Team',0
.data:004198BB align 10h

"Vidar-Team"?

.rdata:00417588 aVidarTeam 0 db 'Vidar-Team',0
.rdata:00417593 align 4
```



调试



Thanks

