# TP 2 - Problem 8 - I

```
1  #include <cstring>
2  #include <iostream>
3
4  #define SHOW(arg) std::cout << "Macro SHOW “" #arg "”: " << (arg) << '\n';
5
6  // Only to learn pointer arithmetic.
7  void reverseString1(char *chr_ptr) {
8    // The “strlen” function returns a size_t variable which is an unsigned
9    // one.
10   size_t n{std::strlen(chr_ptr)};
11   if (n > 1) {
12     char *end_ptr{chr_ptr + n};
13     n /= 2;
14     // We know that n > 0 so it is safe to decrement it.
15     do {
16       char tmp{*chr_ptr};
17       *chr_ptr++ = *--end_ptr;
18       *end_ptr = tmp;
19     } while (--n > 0);
```

# TP 2 - Problem 8 - II

```
20      }
21    }
22
23    // Only to learn pointer arithmetic.
24    void reverseString2(char *chr_ptr) {
25      char *end_ptr{chr_ptr};
26      // Search for the null character.
27      while (*end_ptr != '\0')
28        ++end_ptr;
29      // Now, “end_ptr” points to the null character: it will be
30      // pre-decremented before dereferencing.
31      while (chr_ptr < end_ptr) {
32        char tmp{*chr_ptr};
33        *chr_ptr++ = *--end_ptr;
34        *end_ptr = tmp;
35      }
36    }
37
38    int main() {
39      {
```

# TP 2 - Problem 8 - III

```
40        char string[]{""};
41        reverseString1(string);
42        SHOW(string)
43        reverseString2(string);
44        SHOW(string)
45      }
46      {
47        char string[]{"a"};
48        reverseString1(string);
49        SHOW(string)
50        reverseString2(string);
51        SHOW(string)
52      }
53      {
54        char string[]{"ab"};
55        reverseString1(string);
56        SHOW(string)
57        reverseString2(string);
58        SHOW(string)
59      }
```

# TP 2 - Problem 8 - IV

```
60      {
61        char string[]{"abc"};
62        reverseString1(string);
63        SHOW(string)
64        reverseString2(string);
65        SHOW(string)
66      }
67
68      return 0;
69    }
```

# TP 2 - Problem 8 - V

Output:

```
1  Macro SHOW “string”:
2  Macro SHOW “string”:
3  Macro SHOW “string”: a
4  Macro SHOW “string”: a
5  Macro SHOW “string”: ba
6  Macro SHOW “string”: ab
7  Macro SHOW “string”: cba
8  Macro SHOW “string”: abc
```