

```
1 #include <iostream>
2 #include <string>
3 #include <vector>
4 #include <ctime>
5 #include <cstdlib>
6 #include <algorithm>
7
8 bool hasUpperCase(const std::string& password) {
9     return std::any_of(password.begin(), password.end(), ::isupper);
10 }
11
12 bool hasLowerCase(const std::string& password) {
13     return std::any_of(password.begin(), password.end(), ::islower);
14 }
15
16 bool hasDigit(const std::string& password) {
17     return std::any_of(password.begin(), password.end(), ::isdigit);
18 }
19
20 bool hasSpecialChar(const std::string& password) {
21     return password.find_first_of("!@#$$%^&*()") != std::string::npos;
22 }
23
24 std::string generateStrongPassword(const std::string& input) {
25     std::string generated = input;
26
27     // Add missing character types
28     if (!hasUpperCase(generated)) {
29         generated += 'A' + (rand() % 26); // Add a random uppercase letter
30     }
31     if (!hasLowerCase(generated)) {
32         generated += 'a' + (rand() % 26); // Add a random lowercase letter
33     }
34     if (!hasDigit(generated)) {
35         generated += '0' + (rand() % 10); // Add a random digit
36     }
37     if (!hasSpecialChar(generated)) {
38         generated += "!@#$$%^&*()[" + rand() % 10; // Add a random special
39             character
40     }
41
42     // Shuffle the generated password to ensure randomness
43     std::random_shuffle(generated.begin(), generated.end());
44
45     // Ensure minimum length
46     while (generated.length() < 12) {
47         generated += 'A' + (rand() % 26); // Add random characters to meet
48             length
49     }
```

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48
49     return generated;
50 }
51
52 int main() {
53     srand(static_cast<unsigned int>(time(0))); // Seed for randomness
54     std::string password;
55
56     std::cout << "Enter a password to improve its strength: ";
57     std::cin >> password;
58
59     std::string strongPassword = generateStrongPassword(password);
60     std::cout << "Suggested stronger password: " << strongPassword <<
        std::endl;
61
62     return 0;
63 }
64
```