

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

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length
49     }
50
51     return generated;
52 }
53
54 int main() {
55     srand(static_cast<unsigned int>(time(0))); // Seed for randomness
56     string password;
57
58     cout << "Enter a password to improve its strength: ";
59     cin >> password;
60
61     string strongPassword = generateStrongPassword(password);
62     cout << "Suggested stronger password: " << strongPassword << endl;
63
64     return 0;
65 }
66
```