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1  /*
2  Daniel Avila May 13th, 2020 Section 19
3  Lab 14: Recursion
4  Description: Using recursion to simplify functions use for its purpose
5  */
6  #include <iostream>
7  #include <string>
8  using namespace std;
9
10 //function to find the gcd of two numbers
11 int gcd(int x, int y)
12 {
13     if (x % y == 0)//tests the second value for the greatest gcd
14     {
15         return y;//sends value of second number
16     }
17     else
18     {
19         return gcd(y, (x % y));//keeps calculating until it equals zero; to 1
20     }
21 }
22 //function that reverses a user input string
23 void frequency(string input, int position)
24 {
25     if (position < input.length())//start position is the beginning; 0
26     {
27         frequency(input, position + 1);//next letter in the string
28         cout << input[position]; //displays the string backwards
29     }
30 }
31 //function to test if string is a palindrome
32 bool palindromeTest(string input)
33 {
34     if (input.size() <= 1)//tests for single char string input
35     {
36         return true;//always is a palindrome
37     }
38     else if (input[0] == input[input.size() - 1])//checking for same letters from ↗
39         start and end
40     {
41         //if it does, then it will go to the set of letters
42         return palindromeTest(input.substr(1, input.size() - 2));//checking for ↗
43         next set of letters
44     }
45     else
46     {
47         return false;//two letters don't match so automatically it is not a ↗
48         palindrome
49     }
50 }
51
52 int main()
```

```
50 {
51     int int1, int2;
52     cout << "Enter two integers" << endl;
53     cin >> int1 >> int2;
54     cout << "The greatest common divisor of " << int1 << " and ";
55     cout << int2 << " is " << gcd(int1, int2) << endl << endl; //function is called
56     cin.ignore(); //to get rid of previous input
57
58     string str1;
59     cout << "The unaltered string is:" << endl;
60     getline(cin, str1);
61     cout << "The string backwards is:" << endl;
62     frequency(str1, 0); //calls funtion that displays the string reversed
63     cout << endl << endl;
64
65     string str2;
66     cout << "Enter possible palindrome:" << endl;
67     getline(cin, str2);
68     if (palindromeTest(str2)) //if statement that checks for T/F return
69     {
70         cout << "The string " << str2 << " is a Palindrome" << endl; //if it's true
71     }
72     else
73     {
74         cout << "The string " << str2 << " is Not a Palindrome" << endl; //if it's false
75     }
76
77     system("pause>nul");
78     return 0;
79 }
```

Enter two integers

890

245

The greatest common divisor of 890 and 245 is 5

The unaltered string is:

gateman

The string backwards is:

nametag

Enter possible palindrome:

racecar

The string racecar is a Palindrome