Bangladesh University of Business and Technology

Department of Computer Science and Engineering

CSE 232: Data Structures Lab

Solution to Lab 02 Tasks

Task 1

Write a program which will take a string as input and capitalize it (The first character of the string should be a capital letter).

Sample Input: lab	Sample Output: Lab
Sample Input: TaSKs	Sample Output: TaSKS

Sample Solution:

```cpp
#include <iostream>
using namespace std;
int main()
{
    string str;
    cin >> str;
    if (str[0] >= 'a' && str[0] <= 'z')
        str[0] = str[0] - 32;
    cout << str << endl;
}
```

Task 2

Write a program that will take two strings as input and compare them lexicographically (abb is greater than aba. The words in a dictionary are sorted in a lexicographical order). The letters' case does not matter, that is an uppercase letter is considered equivalent to the corresponding lowercase letter.
If the first string is less than the second one, print "-1".
If the second string is less than the first one, print "1".
If the strings are equal, print "0".

Sample Input: aaaa aaaA	Sample Output: 0
Sample Input: abcdefg AbCdEfF	Sample Output: 1

Sample Solution:

```cpp
#include <iostream>
using namespace std;

int main()
{
    string str1, str2;
    cin >> str1 >> str2;
    int l = max(str1.size(), str2.size());
    for (int i = 0; i < l; i++)
    {
        if (str1[i] >= 'a' && str1[i] <= 'z')
            str1[i] = str1[i] - 32;
        if (str2[i] >= 'a' && str2[i] <= 'z')
            str2[i] = str2[i] - 32;
    }
    if (str1 > str2)
        cout << "1" << endl;
    else if (str2 > str1)
        cout << "-1" << endl;
    else
        cout << "0" << endl;
}
```

Task 3

Write a program that will take a string as input and change it so that it either only consists of lowercase letters, or only consists of uppercase letters. You should change the string in a way so that the least number of characters are changed.

For example, "HoUse" should be changed to "house", "ViP" should be changed to "VIP".

If the word contains an equal number of lowercase and uppercase letters, change all the uppercase letters to lowercase letters.

Sample Input: ExaMPlE	Sample Output: EXAMPLE
Sample Input: oPtIOn	Sample output: option

Sample Solution:

```cpp
#include <iostream>
using namespace std;

int main()
{
    string str;
    int countUpper = 0, countLower = 0;
    cin >> str;
    for (int i = 0; i < (int)str.size(); i++)
    {
        if (str[i] >= 'a' && str[i] <= 'z')
            countLower++;
        if (str[i] >= 'A' && str[i] <= 'Z')
            countUpper++;
    }
    if (countLower >= countUpper)
    {
        for (int i = 0; i < (int)str.size(); i++)
        {
            if (str[i] >= 'A' && str[i] <= 'Z')
                str[i] = str[i] + 32;
        }
    }
    else
    {
        for (int i = 0; i < (int)str.size(); i++)
        {
            if (str[i] >= 'a' && str[i] <= 'z')
                str[i] = str[i] - 32;
        }
    }
    cout << str << endl;
}
```

Task 4

Write a program that will take a word/phrase as input and check whether it's a palindrome or not. A palindrome is a word which reads the same backwards as forwards. Ignore the cases, e.g. an uppercase letter should be considered the same as its lowercase counterpart. For example, "mADam" is a palindrome.

Sample Input: mADam	**Sample Output:** Palindrome
Sample Input: Tacocat	**Sample output:** Palindrome
Sample Input: Lime	**Sample Input:** Not palindrome

Sample Solution:

```cpp
#include <iostream>
using namespace std;

int main()
{
    string str, rev;
    getline(cin, str);
    for (int i = 0; i < (int)str.size(); i++)
        if (str[i] >= 'A' && str[i] <= 'Z')
            str[i] = str[i] + 32;
    for (int i = 0; i < (int)str.size(); i++) // For handling spaces in a string
        if (str[i] == ' ')
        {
            string b = str.substr(0, i);
            string e = str.substr(i + 1, (int)str.size() - i - 1);
            str = b + e;
        }
    rev = str;
    reverse(rev.begin(), rev.end());
    if (str == rev)
        cout << "Palindrome" << endl;
    else
        cout << "Not Palindrome" << endl;
}
```

Task 5 [Bonus]

Write a program that will take a string as input. It will check whether after deleting several letters, the resulting word becomes "hello" or not. Ignore the cases, e.g. an uppercase letter should be considered the same as its lowercase counterpart.

Sample Input:	Sample Output:
ahheellouu	YES
Sample Input:	Sample output:
HELlo	YES
Sample Input:	Sample Input:
hlelo	NO

Sample Solution:

```cpp
#include <iostream>
using namespace std;

int main()
{
    string str;
    cin >> str;
    string pattern = "hello";
    int j = 0;
    for (int i = 0; i < (int)str.size(); i++)
        if (str[i] == pattern[j])
            j++;
    if (j == 5)
        cout << "YES" << endl;
    else
        cout << "NO" << endl;
}
```