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| **STRING DATA STRUCTURE - PROGRAMS**  **NAME:** MUHAMMAD IBTISAM AFZAL  **REGISTRATION NO:** *FA22-BCS-073*  **SUBMITTED TO:** Mam Tahreem |

**ASSIGNMENT NO. 2**

**Question 1: Write down C/C++ Codes for the following functions of strings data structure:**

1. **Removing punctuations from a given string**

#include <iostream>

using namespace std;

int main(){

cout<<”Enter a string: ”<< endl;

string str;

getline(cin, str);

for (int i=0; i<str.length(); i++){

int num= (int) str[i];

if ((num>=33 & num<=64) || (num>=91 & num<96) || (num>=123 & num<=126)) {

str.erase (I, 1);

}}

Cout << str << endl;

Return 0;

}

1. **Rearrange characters in a string such that no two adjacent are same.**

#include<iostream>

Using namespace std;

Int main(){

Cout<<”Enter a string: “ <<endl;

string str;

getline(cin, str);

for (int i=0; i<str.length()-1; i++){

if (str[i] == str[i+1]){

char temp = str[i+1];

str[i+1] = str[str.length()-1 ];

str[str.length()-1] = temp; } }

cout << str << endl;

return 0; }

1. **Program to check if input is an integer or a string**

#include<iostream>

Using namespace std;

Bool Is\_Number( string str){

Int start = 0;

If (str[start] == ‘+’ || str[start] == ‘-‘) {

Start++; }

For (; start < str.length(); start++){

If (str[start] < ‘o’ & str [start] > ‘9’){

Return false; } }

Return true; }

Int main(){

Cout<<”Enter a string: “ <<endl;

string str;

getline(cin, str);

if (Is\_Number(str)){

cout << “Integer” << endl:

else {

cout << “string” << endl;}

return 0; }

1. **C++ program to find second most frequent character**

#include <iostream>

#include <unordered\_map>

using namespace std;

char findMostFrequentChar(string str) {

unordered\_map<char, int> charCount;

char mostFrequentChar;

int maxCount = 0;

for (char c : str) {

charCount[c]++;

if (charCount[c] > maxCount) {

maxCount = charCount[c];

mostFrequentChar = c;

}

}

return mostFrequentChar;

}

int main() {

string str = "Hello, World!";

char mostFrequentChar = findMostFrequentChar(str);

cout << "The most frequent character is: " << mostFrequentChar << endl;

return 0;

}

1. **C++ Program to Sort an array of names or strings.**

#include <iostream>

using namespace std;

int main() {

cout << "How many names.";

int size ;

cin >> size;

string array [size];

cout<<"Enter "<< size << "names";

for (int i=0; i< size ; i++) {

cin >>array[i]; }

for (int i=0; i< size -1; i++){

for (int j=0; j< size; j++){

if (array [j]> array [j+1]} {.

string name= array [j+1];

array [j+1] = array [j];

array [j] = name; }}}

for (int i=0;i< size ; j++){

cout << array [1] << " "; }

return 0;

}

1. **C++ program to concatenate a string given number of times**

#include <iostream>

#include <string>

using namespace std;

string concatenateString(string str, int times) {

string result = "";

for (int i = 0; i < times; i++) {

result += str;

}

return result;

}

int main() {

string input = "Hello";

int times = 3;

string concatenatedString = concatenateString(input, times);

cout << "Concatenated String: " << concatenatedString << endl;

return 0;

}

1. **std::string::append vs std::string::push\_back() vs Operator += in C++**

In C++ There are several ways to add characters to a string object:

**Std::string::append():**

append is a member function of the std::string class that is used to add a sequence of characters to end of existing string.

**Example:**

Std::string:: str 1 = “Hello”;

Std::string:: str 2 = “World”;

Std.append(str2);

After this str1 contain “Hello World”.

**Std::string::puch\_back():**

Push\_back() is a member function of the std::string class that is used to add a single character to the end of the existing string.

**Example:**

Std:: String:: str1 = "Hello";

Str.push\_back(‘!’);

After this : str will contain “Hello!”

**Operaton + =**

The += operator is an overloaded of the std::string class that is used to concatenate two strings.

**Example:**

std::string :: str1 = "Hello";

Std::string str2 = “World!”;

Str1+= str2;

After this str1 will str1 will contain Hello world!"

1. **Comparing two strings in C++**

#include <iostream>

#include <string>

using namespace std;

int main() {

string str1, str2;

cout << "Enter string 1: ";

cin >> str1;

cout << "Enter string 2: ";

cin >> str2;

if (str1 == str2) {

cout << "Both strings are equal." << endl;

} else {

cout << "Strings are not equal." << endl;

}

return 0;

}

1. **Extract all integers from string in C++**

#include <iostream>

using namespace std;

int main() {

cout<<"enter a string"<<endl;

string str;

cin>>str;

string num\_str=" ";

for(int start=0; start<str.length(); start++) // Fixed error: added parentheses after str.length{

if(str[start]>='0' && str[start]<='9') // Fixed error: changed >= to >='0' and <=9 to <='9' {

num\_str+= str[start];

} }

cout<<"the extract integers are"<<num\_str<<endl;

return 0;

}

1. **C++ program to Replace a word in a text by another given word**

#include <iostream>

#include <string>

using namespace std;

int main() {

string text = "efficient.";

string oldWord = "sample";

string newWord = "replacement";

size\_t pos = text.find(oldWord);

while (pos != string::npos) {

text.replace(pos, oldWord.length(), newWord);

pos = text.find(oldWord, pos + newWord.length());

}

cout << "good " << text << endl;

return 0;