AIUB

CSC 3220: Compiler Design

Lab 02

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1. Iteration(Loop)

--> for

```
#include<bits/stdc++.h>
using namespace std;

int main(){
for(int i=0;i<10;i++){ // 0 1 2 3 4 5 6 7 8 9
        if(i%2!=0) continue;
        cout<<i<<" ";
}
return 0;
}
```

```
#include<bits/stdc++.h>
using namespace std;

// remove all space -- for and continue
char * removespace(string m){

char *l=  (char *)malloc(100*sizeof(char));

    int j=0;
    for(int i=0;m[i]!='\0';i++){

            if(m[i]==' ') continue;
            else{
                    l[j]=m[i];
                    j++;
            }
    }
    return l;
}

int main(){

string name="Supta Richard Philip";

//int s=name.length();
//cout<<s<<endl;

char * h = removespace(name);

cout<<h<<endl;
```

```
return 0;
}
```

---> break/ continue

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    // count the words-- for loops

    string name="Supta Richard Philip";

   // int l = name.length();
    //printf("%d\n",strlen(name));
    int c=1;
    for(int i=0;i<=name.length();i++){
            if(name[i]==' ') continue;
            c++;
    }

    cout<<c<<endl;
return 0;
}
```

2. Array

```
#include<bits/stdc++.h>
using namespace std;
// user define function
void printList(int *p, int s){
    for(int i=0;i<s;i++){ // 0 1 2 3 4
        cout<<p[i]<<endl;
}
}

int main(){
    int a[5]={10,20,30,40,50};
    printList(a,5);
return 0;
}
```

3. Functions(Recursive)

4. String

```
#include<bits/stdc++.h>
using namespace std;

int mystrlenforObject(string m){
        int c=0;
    for(int i=0;m[i]!='\0';i++){
        c++;
```

```
    }
    return c;
}

int mystrlenforArray(char m[]){
        int c=0;
    for(int i=0;m[i]!='\0';i++){
        c++;
    }
    return c;
}

int main(){
//Array and pointer are equivalent
char a[]={'I',' ','L','o','v','e',' ','C','\0'};
cout<<strlen(a)<<" "<<mystrlenforArray(a)<<endl;

char *b="I love C++";
cout<<strlen(b)<<" "<<mystrlenforArray(b)<<endl;

string c="I love Bangladesh as well.";
cout<<c.length()<<" "<<mystrlenforObject(c)<<endl;

return 0;
}
```

User Define string compare function

```
#include<bits/stdc++.h>
using namespace std;

int mystrcmp(char m[], char n[]){
    int flag =0;
    if(strlen(m)==strlen(n)){
       for(int i=0;m[i]!='\0';i++){
            if(m[i]!=n[i]){
                flag=-1;
                break;
            }
    }
    }else{
        flag=-1;
    }
    return flag;
}

int main(){
char a[]="I love C++";
char b[]="I love C++.";
cout<<mystrcmp(a,b)<<endl;
return 0;
}
```

User Define string concatination function

```
#include<bits/stdc++.h>
using namespace std;

char * mystrcat(char m[], char n[]){
   char *l= (char *)malloc((strlen(m)+strlen(n)+1)*sizeof(char));
        int j=0;
       for(int i=0;m[i]!='\0';i++){
           l[j]=m[i];
           j++;
       }

       for(int i=0;n[i]!='\0';i++){
           l[j]=n[i];
           j++;
       }
       l[++j]='\0';

    return l;
}

int main(){
char a[]="I love C++";
char b[]="I love C++";
char *p = mystrcat(a,b);
cout<<p<<endl;
return 0;
}
```

5. STL(Vector, map, list, set)/

--> vector --> Map --> set ** write a function that takes marks as arguments and return grade and cgpa.[Use functions and map(STL)]

```
#include<bits/stdc++.h>
using namespace std;

map<char,double> findCgpa(int m){
    map<char,double> gc;
    switch(m){
        case 80 ... 100:
            gc.insert({'A',4.0});
            break;
        case 60 ... 79:
             gc.insert({'B',3.0});
            break;
        case 40 ... 59:
             gc.insert({'C',2.5});
            break;
        default:
            gc.insert({'F',0.0});
            break;
```

```
    }
    return gc;
}

int main(){

    int marks;
    cin>>marks;
    map<char,double> m = findCgpa(marks);
    for (map<char,double>::iterator itr = m.begin(); itr != m.end(); ++itr) {
        cout << itr->first
             << '\t' << itr->second << '\n';
    }

return 0;
}
```

5. Array, Funcion and pointer

6. File Operations

input program from .cpp file

```
#include <iostream>
using namespace std;
int main(){
    int a,b; //input variables
    cin >> a >> b; //take input from stdin
    cout << a+b*a << endl;
    /*
    cout << a+b;
    */
    return 0;
}
```

```
#include <bits/stdc++.h>
using namespace std;

int main(){
    ifstream infile;
    infile.open("in.cpp");
    //ofstream outfile;
    //outfile.open("copy_in.cpp");
    string line;
    string allline;
    while(!infile.eof()){

        getline(infile,line);
        //cout<<line<<endl;
        allline+=line+"\n";
    }
    cout << allline;
```

```
    //outfile<<allline;
    infile.close();
    //outfile.close();
    return 0;
}
```

Tokenizing a string using stringstream

```
// Tokenizing a string using stringstream
#include <bits/stdc++.h>
using namespace std;

int main()
{


    ifstream infile;
    infile.open("in.cpp");

    string allline;
    string line;
    while(!infile.eof()){

        getline(infile,line);
        //cout<<line<<endl;
        allline+=line+"\n";
    }

    // Vector of string to save tokens
    vector <string> tokens;

    // stringstream class check1
    stringstream check1(allline);

    string intermediate;

    // Tokenizing w.r.t. space ' '
    while(getline(check1, intermediate, ' '))
    {
        tokens.push_back(intermediate);
    }

    // Printing the token vector
    for(int i = 0; i < tokens.size(); i++)
        cout << tokens[i] <<endl;
}
```

User define Tokenizer

```
#include <bits/stdc++.h>
using namespace std;

vector<string> mystrtok(string str, char delim)
```

```
{
    vector<string> tokens;
    string temp = "";
    for(int i = 0; i < str.length(); i++)
    {
        if(str[i] == delim)
        {
            tokens.push_back(temp);
            temp = "";
        }
        else
            temp += str[i];
    }
    tokens.push_back(temp);
    return tokens;
}

int main()
{
    string s = "Learn in-demand tech skills in half the time";
    vector<string> tokens = mystrtok(s, ' ');
    for(string s: tokens)
        cout << s << endl;
}
```

remove all space -- for and continue

```
#include<bits/stdc++.h>
using namespace std;
// remove all space -- for and continue
char * removespace(string m){

char *l=  (char *)malloc(100*sizeof(char));

    int j=0;
    for(int i=0;m[i]!='\0';i++){

            if(m[i]==' ') continue;
            else{
                    l[j]=m[i];
                    j++;
            }
    }


    return l;

}

int main(){

string name="Supta Richard Philip";
```

```
//int s=name.length();
//cout<<s<<endl;

char * h = removespace(name);

cout<<h<<endl;

return 0;
}
```

5. Home Work/ Assignment Task

--> write a function that takes marks as arguments and return grade and cgpa.[Use functions and map(STL)] --> Write a C++ program to check a string is palindrome or not. --> Write a C++ program to find all prefix and sufix of a string. --> word ladder in c++ using BFS and dictionary.txt file

> - *Write a myStrlen function which is the same as the library strlen function. Assume the prototype is int myStrlen(char a[]); // int myStrlen(char* a);*

- Write the myStrcpy function which is the same as the library strcpy function. Assume the prototype is void myStrcpy(char a[], char b[]); // void myStrcpy(char* a, char* b);
- Write the myStrcat function which is the same as the library strcat function. Assume the prototype is void myStrcat(char a[], char b[]); // void myStrcat(char* a, char* b);
- Write the myStrcmp function which is the same as the library strcmp function. Assume the prototype is int myStrcmp(char a[], char b[]); // int myStrcmp(char* a, char* b);