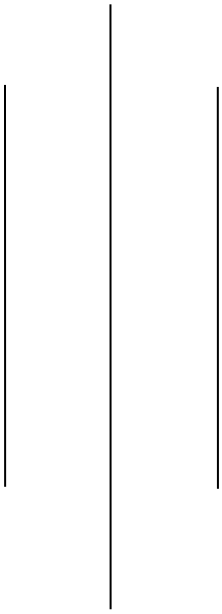
National College of Computer Studies

Paknajol, Kathmandu



Lab Report on
Theory of Computation

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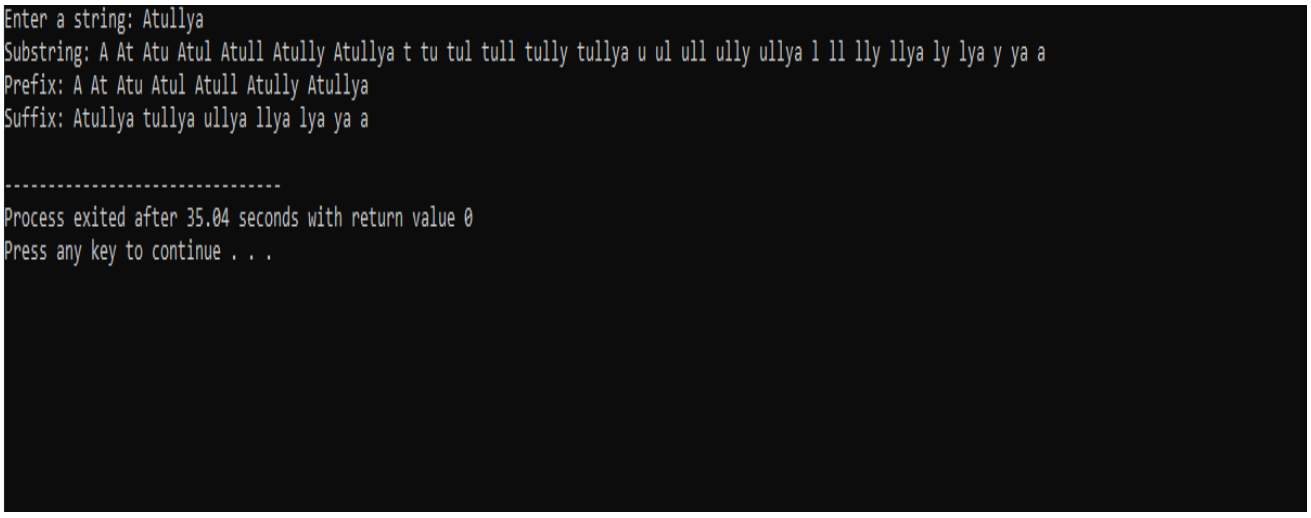
1. **Write a Program to find prefixes, suffixes and substrings from a given string.**

```
#include <iostream>
#include <string>
using namespace std;
int main() {
    string str;
    cout << "Enter a string: ";
    cin >> str;
    cout << "Substring: ";
    for (int i = 0; i < str.length(); i++) {
        for (int j = i; j < str.length(); j++) {
            cout << str.substr(i, j - i + 1) << " ";
        }
    }
    cout << endl;
    cout << "Prefix: ";
    for (int i = 0; i < str.length(); i++) {
        cout << str.substr(0, i + 1) << " ";
```

```
    }
    cout << endl;
    cout << "Suffix: ";
    for (int i = 0; i < str.length(); i++) {
        cout << str.substr(i) << " ";
    }
    cout << endl;

    return 0;
}
```

OUTPUT



2. Write a Program to validate C identifiers and keywords.

```
#include <iostream>
#include <string.h>
#include <set>
using namespace std;
int main()
{
    char str[100];
    int i, l, flag = 0;
    cout << "Enter a string: ";
    cin >> str;
    l = strlen(str);
    if (!((str[0] >= 'a' && str[0] <= 'z') || (str[0] >= 'A' && str[0] <= 'Z') ||
str[0] == '_')) {
        cout << "Invalid identifier" << endl;
        return 0;
    }
    // Check if remaining characters are letters, digits or underscore
    for (i = 1; i < l; i++)
```

```
    {
        if (!((str[i] >= 'a' && str[i] <= 'z') || (str[i] >= 'A' && str[i] <= 'Z') || (str[i] >= '0' && str[i] <= '9') || str[i] == '_'))
        {
            cout << "Invalid identifier" << endl;
            return 0;
        }
    }
    set<string> keywords = {"auto", "break", "case", "char", "const", "continue", "default", "do", "double", "else", "enum", "extern", "float", "for", "goto", "if", "int", "long", "register", "return", "short", "signed", "sizeof", "static", "struct", "switch", "typedef", "union", "unsigned", "void", "volatile", "while"};
    if (keywords.find(str) != keywords.end())  {
        cout << "Keyword" << endl;
   }
    else {
        cout << "Valid identifier" << endl;
    }
    return 0;
}
```

OUTPUT

```
Enter a string: auto
Keyword

------------------------------
```

```
Enter a string: ReactJS
Valid identifier
```

```
Enter a string: 1nstagram@
Invalid identifier

--------------------------------
```