IN THE NAME OF ALLAH, THE GREATEST THE MOST MERCIFUL

INTERNATIONAL ISLAMIC UNIVERSITY CHITTAGONG

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Lab Assignment 2

Matric / ID No. : C211032
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Ans to the Question Number – 1

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

int main()
{
    int row, col;
    cout<<"Row and Column: ";
    cin >> row >> col;
    int arr[row][col];
    for (int i = 1; i <= row; i++)
    {
        for (int j = 1; j <= col; j++)
        {
            cin >> arr[i][j];
        }
    }
    for (int i = 1; i <= col; i++)
    {
        {
            for (int j = 1; j <= row; j++)
            {
                cout << arr[j][i] << " ";
            }
            cout << endl;
        }
    }
    return 0;
}
```

Ans to the Question Number – 2

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

```
int main()
{
    int row, col;
    cout<<"Row and Column : ";
    cin >> row >> col;

    int arr1[row][col], arr2[row][col],
sum[row][col];

    cout<<"Enter 1st Matrix:\n";

    for (int i = 1; i <= row; i++)
    {
        for (int j = 1; j <= col; j++)
        {
            cin >> arr1[i][j];
        }
    }
    cout<<"Enter 2nd Matrix:\n";
    for (int i = 1; i <= row; i++)
    {
        for (int j = 1; j <= col; j++)
        {
            cin >> arr2[i][j];
        }
    }

    cout<<"Sum of 2 Matrix:\n";
    for (int i = 1; i <= row; i++)
    {
        for (int j = 1; j <= col; j++)
        {
            sum[i][j] = arr1[i][j] + arr2[i][j];
            cout << sum[i][j] << " ";
        }
        cout << endl;
    }
    return 0;
}
```

Ans to the Question Number – 3

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

int main()
{
    int row, col;
    cin >> row >> col;
    int arr[row][col];
    for (int i = 1; i <= row; i++)
    {
        for (int j = 1; j <= col; j++)
        {
            cin >> arr[i][j];
        }
    }
    int RowSum = 0, ColSum = 0;
    for (int i = 1; i <= row; i++)
    {
        RowSum = 0;
        for (int j = 1; j <= col; j++)
        {
            RowSum += arr[i][j];
        }
        cout << "Sum of row " << i << " = " <<
RowSum << endl;
    }
    cout << endl;
    for (int i = 1; i <= col; i++)
    {
        ColSum = 0;
        for (int j = 1; j <= row; j++)
        {
            ColSum += arr[j][i];
        }
        cout << "Sum of column " << i << " = "
<< ColSum << endl;
```

```
    }
    return 0;
}
```

Ans to the Question Number – 4

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

int main()
{
    int row1, row2, col1, col2;

    cout << "Row and Column of 1st Matrix: ";
    cin >> row1 >> col1;
    int arr1[row1][col1];
    for (int i = 0; i < row1; i++)
    {
        for (int j = 0; j < col1; j++)
        {
            cin >> arr1[i][j];
        }
    }

    cout << "Row and Column of 2nd Matrix: ";
    cin >> row2 >> col2;
    int arr2[row2][col2];
    for (int i = 0; i < row2; i++)
    {
        for (int j = 0; j < col2; j++)
        {
            cin >> arr2[i][j];
        }
    }

    int multi[row1][col2];
    if (row2 != col1)
    {
```

```
        cout << "\nMultiplication is not
Possible!" << endl;
    }

    else
    {
        for (int i = 0; i < row1; i++)
        {
            for (int j = 0; j < col2; j++)
            {
                multi[i][j] = 0;
                for (int k = 0; k < col2; k++)
                {
                    multi[i][j] += arr1[i][k] *
arr2[k][j];
                }
            }
        }
        cout << "Multiplication is:\n" << endl;
        for (int i = 0; i < row1; i++)
        {
            for (int j = 0; j < col2; j++)
            {
                cout << multi[i][j] << " ";
            }
            cout << endl;
        }
    }
    return 0;
}
```

Ans to the Question Number – 5

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

```cpp
int main()
{
    int row, col;
    cout << "Row and Column : ";
    cin >> row >> col;
    int arr[row][col];
    for (int i = 1; i <= row; i++)
    {
        for (int j = 1; j <= col; j++)
        {
            cin >> arr[i][j];
        }
    }
    int cnt = 0;
    for (int i = 1; i <= row; i++)
    {
        for (int j = 1; j <= col; j++)
        {
            if (arr[i][j] == 0)
            {
                cnt++;
            }
        }
    }
    if (cnt > ((col * row) / 2))
    {
        cout << "The Matrix is a Sparse Matrix"
<< endl;
    }
    else
    {
        cout << "The Matrix is not a Sparse
Matrix" << endl;
    }

    return 0;
}
```

Ans to the Question Number – 6

```
#include<bits/stdc++.h>
#define SIZE 5

int stack[SIZE + 1], top = 0;


int menu(void)
{
    int choice;
    do
    {
        printf("1-push\n2-pop\n0-Exit\n");

        printf("Enter your choice: ");
        scanf("%d", &choice);

        if (choice < 0 || choice > 2)
            printf("\nWrong...Choice
again...\n");
    }

    while (choice < 0 || choice > 2);
    return (choice);
}

void push()
{
    if (top == SIZE)
    {
        printf("Stack Overflow\n");
    }
    else
    {
        printf("Enter a value to push : ");
        int item;
        scanf("%d", &item);
```

```
            top++;
            stack[top] = item;
        }
    }
    void pop()
    {
        if (top == 0)
        {
            printf("Stack Underflow\n");
        }
        else
        {
            int item;
            item = stack[top];
            top--;
        }
    }

    void display()
    {
        if (top == 0)
        {
            printf("The Stack is Empty\n");
        }
        else
        {
            printf("The Stack elements are : ");
            for (int i = 1; i <= top; i++)
            {
                printf("%d ", stack[i]);
            }
            printf("\n");
        }

    }

    int main()
    {
        int choice;
```

```
    do
    {
        choice = menu();
        switch (choice)
        {
        case 1:
            push();
            display();
            break;
        case 2:
            pop();
            display();
            break;
        case 0:
            printf("End of operation\n");
            break;
        }
    }
    while (choice != 0);
    return 0;
}
```

Ans to the Question Number – 7

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

int main()
{
    stack<string>s;
    cout << "Postfix expression : " << endl;
    while (1)
    {
        string str;
        cin >> str;
        s.push(str);

        if (s.top() == "+")
```

```
        {
            s.pop();
            int a = stoi(s.top());
            s.pop();
            int b = stoi(s.top());
            s.pop();

            string ans = to_string(b + a);
            s.push(ans);
        }
        else if (s.top() == "-")
        {
            s.pop();
            int a = stoi(s.top());
            s.pop();
            int b = stoi(s.top());
            s.pop();

            string ans = to_string(b - a);
            s.push(ans);
        }

        else if (s.top() == "*")
        {
            s.pop();
            int a = stoi(s.top());
            s.pop();
            int b = stoi(s.top());
            s.pop();

            string ans = to_string(b * a);
            s.push(ans);
        }
        else if (s.top() == "/")
        {
            s.pop();
            int a = stoi(s.top());
            s.pop();
            int b = stoi(s.top());
```

```
            s.pop();

            string ans = to_string(b / a);
            s.push(ans);
        }
        else if (s.top() == "^")
        {
            s.pop();
            int a = stoi(s.top());
            s.pop();
            int b = stoi(s.top());
            s.pop();

            int p = pow(b, a);

            string ans = to_string(p);
            s.push(ans);
        }
        else if (s.top() == ")")
        {
            s.pop();
            cout << s.top() << endl;
            break;
        }
    }
    return 0;
}
```

Ans to the Question Number – 8

Ans to the Question Number – 9

(A)

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


int main()
{

    string str;
    getline(cin, str);

    int cnt = 0;
    for (int i = 0; str[i] != '\0'; i++)
    {
        cnt++;
    }
    cout << "The Length of the string is: " <<
cnt;
    return 0;
}
```

(B)

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


int main()
{
    string str1, str2;
    getline(cin, str1);
    for (int i = 0; str1[i] != '\0'; i++)
    {
        str2 += str1[i];
    }
```

```
      cout << "The copied string is : " << str2;
    return 0;
}
```

(C)

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


int main()
{
    int i, j;
    char str1[200], str2[200];

    cout << "Enter 1st string: ";
    cin.getline(str1, 200);
    cout << "Enter 2nd string: ";
    cin.getline(str2, 200);

    while (str1[i] != '\0')
    {
        i++;
    }
    j = 0;
    while (str2[j] != '\0')
    {
        str1[i] = str2[j];
        i++;
        j++;
    }
    str1[i] = '\0';
    cout << "After Concatenate,the string is : "
<< str1;
    return 0;
}
```

(D)

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
    int i, j;

    string str1, str2;
    cout << "Enter 1st string: ";
    getline(cin, str1);
    cout << "Enter 2nd string: ";
    getline(cin, str2);

    i = 0, j = 0;
    while (str1[i] != '\0')
    {
        i++;
    }
    while (str2[j] != '\0')
    {
        j++;
    }
    int temp = 1;
    if (i != j)
        temp = 0;
    else
    {
        for (i = 0, j = 0; str1[i] != '\0'; i++,
j++)
        {
            if (str1[i] != str2[j])
            {
                temp = 0;
                break;
            }
        }

    }
```

```
    if (temp == 1)
        cout << "Strings are equal" << endl;
    else
        cout << "Strings are not equal" << endl;
    return 0;
}
```

(E)

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

int main()
{
    string str;
    cout<<"Enter the String: ";
    getline(cin,str);

    int n=0;
    while (str[n] != '\0')
    {
        n++;
    }

    for (int i = 0; i < n / 2; i++)
    {
        char ch = str[i];
        str[i] = str[n - i - 1];
        str[n - i - 1] = ch;
    }
    cout<<"String After Reverse: "<<str;

    return 0;
}
```

Ans to the Question Number – 10

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
    string str, add;
    int n;
    getline(cin, str);
    cin >> add >> n;

    int l1 = str.size();
    int l2 = add.size();
    int sz = l1 + l2;

    int i, j;
    for (i = sz - 1, j = l1 - 1; i > n; i--, j--
)
    {
        str[i] = str[j];
    }

    for (i = n - 1, j = 0; j < l2; i++, j++)
    {
        str[i] = add[j];
    }
    for (i = 0; i < sz; i++)
    {
        cout << str[i];
    }
    return 0;
}
```

Ans to the Question Number – 11

```
#include<bits/stdc++.h>
```

```
using namespace std;
int main()
{
    string str, newstr;
    getline(cin, str);

    int length, pos, i = 0;
    cin >> length;
    cin >> pos;
    int strLen = str.length();
    for (i = 0; i < pos; i++)
    {
        newstr[i] = str[i];
    }

    for (int j = (length + pos); j < strLen;
j++)
    {
        newstr[i] = str[j];
        i++;
    }
    cout << "Editted Text is : ";
    for (int k = 0; k < i; k++)
    {
        cout << newstr[k];
    }
    return 0;
}
```

Ans to the Question Number – 12

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

```cpp
int main()
{
    string str1, str2;
    cin >> str1 >> str2;
    int maxx = str1.size() - str2.size() + 1;
    int ans;

    for (int i = 0; i < maxx; i++)
    {
        bool found = 0;

        for (int j = 0; j < str2.size(); j++)
        {
            if (str2[j] != str1[j + i])
            {
                found = 1;
            }
        }

        if (found == 0)
        {
            ans=i+1;
            break;
        }
    }

    if(ans>0)
    {
        cout << "Found at index: " << ans <<
endl;
    }
    else
    {
        cout<<"Not found"<<endl;
    }

    return 0;
}
```

Ans to the Question Number – 13

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

int main()
{

    string str1, str2, str3;
    cin >> str1 >> str2 >> str3;
    int len1 = str1.size();
    int len2 = str2.size();
    int len3 = str3.size();
    int tolen = len1 - len2 + len3;
    int l1 = len1 - len2 ;


    int maxx = str1.size() - str2.size() + 1;
    int pos;

    for (int i = 0; i < maxx; i++)
    {
        bool found = 0;

        for (int j = 0; j < str2.size(); j++)
        {
            if (str2[j] != str1[j + i])
            {
                found = 1;
            }
        }

        if (found == 0)
        {
            pos = i + 1;
            break;
        }
    }
```

```
    if (pos > 0)
    {
        for (int i = pos - 1; i < len1; i++)
        {
            str1[i] = str1[i + len2];
        }

        string newstr;
        for (int i = 0; i < pos - 1; i++)
        {
            newstr[i] = str1[i];
        }
        int l = pos - 1;
        for (int i = 0; i < len3; i++)
        {
            newstr[l] = str3[i];
            l++;
        }

        for (int i = pos - 1; i < str1.size();
i++)
        {
            newstr[l] = str1[i];
            l++;
        }

        for (int i = 0; i < (str1.size() +
len3); i++)
        {
            cout << newstr[i];
        }

    }
    else
    {
        cout << "Not found" << endl;
    }
```

```
    return 0;
}
```

Ans to the Question Number – 14

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

int main()
{
    string s;
    getline(cin,s);
    int frq[26] = {0};

    int i, j;
    while (s[i] != '\0')
    {
        if (s[i] >= 'a' && s[i] <= 'z')
        {
            j = s[i] - 'a';
            frq[j]++;
        }
        i++;
    }

    for (i = 0; i < 26; i++)
    {
        if (frq[i] > 0)
        {
            cout << char(i + 'a') << "
occurrence " << frq[i] << " times." << endl;
        }
    }
    return 0;
}
```

Ans to the Question Number – 15

```cpp
#include<iostream>
using namespace std;
int main()
{
    int b, d, i, j , k, value, arr[200];
    string s;
    cin >> s;
    cin >> b >> d;
    int ls;
    ls = s.size();
    int m = 1, decimal = 0;
    for (i = ls - 1; i >= 0; i--)
    {
        if ('0' <= s[i] && s[i] <= '9')
            value = (int)s[i] - '0';
        else value = (int)s[i] - 'A' + 10;
        decimal += (value * m);
        m *= b;
    }
    j = 0;
    while (decimal)
    {
        arr[j++] = decimal % d;
        decimal /= d;
    }
    k = j;
    for (i = j - 1; i >= 0; i--)
    {
        if (arr[i] >= 10)
            cout << (char)(arr[i] - 10 + 'A');
        else
            cout << arr[i];
    }
    return 0;
}
```

Ans to the Question Number – 16

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

int main()
{
    int x, y, a, b, t, gcd, lcm;
    cout << "Enter two integers: " << endl;
    cin >> x >> y;
    a = x;
    b = y;
    while (b != 0)
    {
        t = b;
        b = a % b;
        a = t;
    }
    gcd = a;
    lcm = (x / gcd)* y;

    cout << "GCD: " << gcd << endl;
    cout << "LCM: " << lcm << endl;
    return 0;
}
```