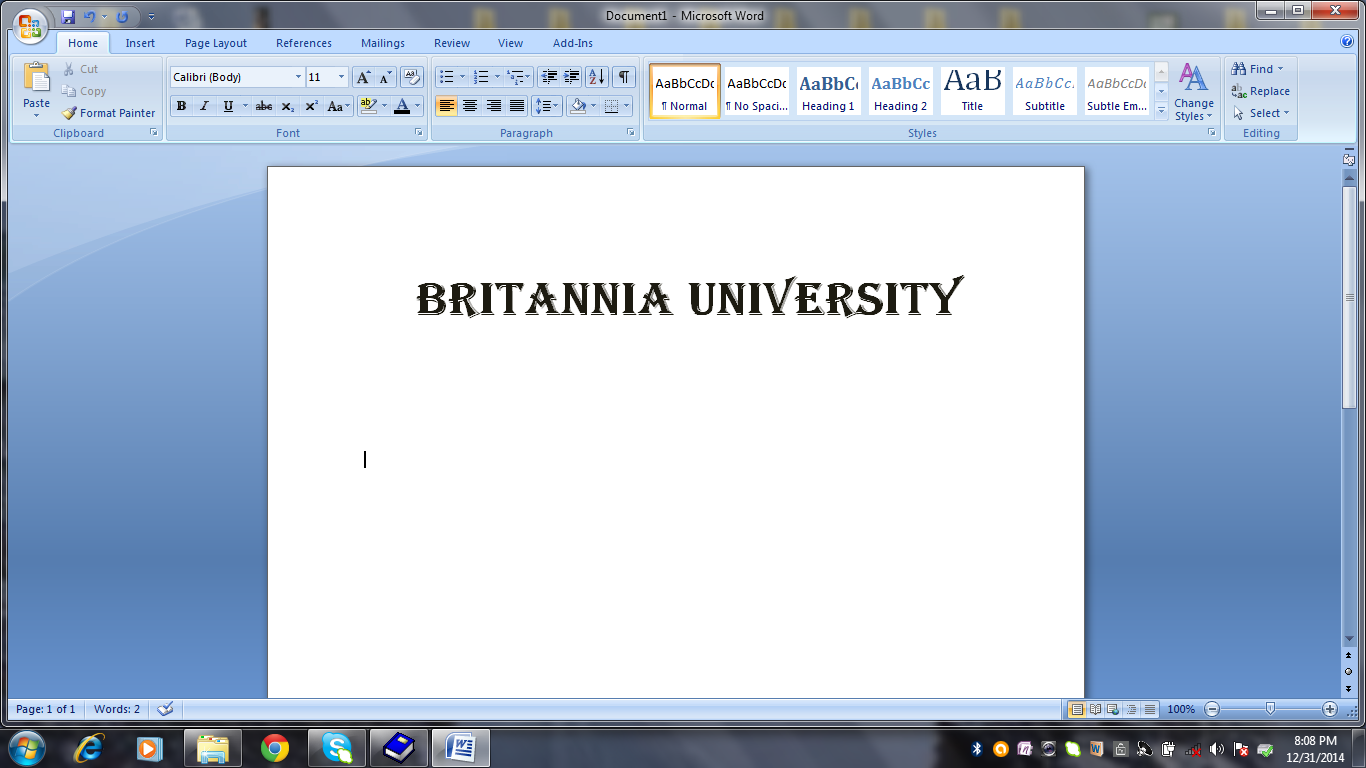


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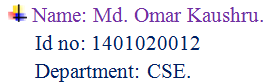
* **Lab report on:**

1. A C++ program to show forward difference table of symbolic representation.
2. A C++ program to detect errors using forward difference table.
3. A C++ program which uses Newton forward difference formulae of interpolation to find a specific value.



Date of Submission: 19-04-2016

Submitted by:

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* **A C++ program to show forward difference table of symbolic representation.**

#include <iostream>

**using** **namespace** std**;**

**int** main**()**

**{**

**int** a**[**10**][**10**],**i**,**j**,**n**,**k**,**x**,**y**;**

cin**>>**n**;**

**for(**i**=**1**;** i**<=**n**;** i**++)**

cin**>>**a**[**i**][**1**];**

y**=**n**;**

**for(**j**=**1**;** j**<**n**;** j**++)**

**{**

x**=**1**;**

**for(**i**=**1**;** i**<=(**y**-**x**);** i**++)**

**{**

a**[**i**][**j**+**1**]=** a**[**i**][**j**];**

**}**

y**--;**

**}**

y**=**n**;**

cout**<<"\n\n";**

**for(**i**=**0**;** i**<**n**;** i**++)**

**{**

**if(**i**==**0**)**

cout**<<"Y ";**

**else**

cout**<<"del^"<<**i**<<" ";**

**}**

cout**<<**endl**;**

**for(**j**=**1**;** j**<=**n**;** j**++)**

**{**

**for(**i**=**1**;** i**<=**y**;** i**++)**

**{**

cout**<<"y"<<**a**[**j**][**i**]<<" ";**

**}**

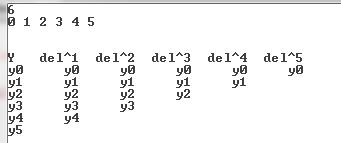
y**--;**

cout**<<**endl**;**

**}**

**}**

Sample input/output:



* A C++ program to detect errors using forward difference table.

#include <iostream>

#include <cstdio>

**using** **namespace** std**;**

**int** main**()**

**{**

**int** i**,**j**,**n**,**k**,**x**,**y**;**

**float** a**[**10**][**10**];**

cin**>>**n**;**

cout**<<"Enter xi:"<<**endl**;**

**for(**i**=**0**;** i**<=**n**;** i**++)**

cin**>>**a**[**i**][**0**];**

cout**<<"Enter yi:"<<**endl**;**

**for(**i**=**0**;** i**<=**n**;** i**++)**

cin**>>**a**[**i**][**1**];**

y**=**n**-**1**;**

**for(**j**=**2**;** j**<=(**n**+**1**);** j**++)**

**{**

**for(**i**=**0**;** i**<=**y**;** i**++)**

**{**

a**[**i**][**j**]=**a**[**i**+**1**][**j**-**1**]-**a**[**i**][**j**-**1**];**

**}**

y**--;**

**}**

y**=**n**+**1**;**

cout**<<"\nThe difference table is:\n\n";**

cout**<<"x y ";**

**for(**i**=**1**;** i**<=**n**;** i**++)**

cout**<<"d^"<<**i**<<" ";**

cout**<<"\n\n";**

**for(**i**=**0**;** i**<=**n**;** i**++)**

**{**

**for(**j**=**0**;** j**<=**y**;** j**++)**

**{**

printf**("%.2f ",**a**[**i**][**j**]);**

**}**

y**--;**

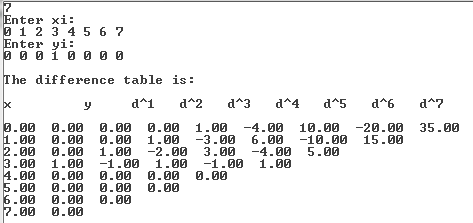
cout**<<**endl**;**

**}**

**return** 0**;**

**}**

**Sample input/output:**



* A C++ program which uses Newton forward difference formulae of interpolation to find a specific value.

#include <iostream>

#include <cstdio>

**using** **namespace** std**;**

**int** fact**(int** n**)**

**{**

**int** f**=**1**;**

**for(int** i**=**1**;** i**<=**n**;** i**++)**

**{**

f**=**f**\***i**;**

**}**

**return** f**;**

**}**

**float** pp**(float** p**,int** n**)**

**{**

**float** s**=**p**;**

**for(int** i**=**2**;** i**<=**n**;** i**++)**

**{**

s**=**s**\*(**p**-(**i**-**1**));**

**}**

**return** s**;**

**}**

**int** main**()**

**{**

**int** i**,**j**,**n**,**k**;**

**float** a**[**10**][**10**],**sum**,**p**,**q**,**h**,**x**,**x0**,**y**;**

cin**>>**n**;**

cout**<<"Enter xi"<<**endl**;**

**for(**i**=**0**;** i**<=**n**;** i**++)**

cin**>>**a**[**i**][**0**];**

cout**<<"Enter yi"<<**endl**;**

**for(**i**=**0**;** i**<=**n**;** i**++)**

cin**>>**a**[**i**][**1**];**

y**=**n**-**1**;**

**for(**j**=**2**;** j**<=(**n**+**1**);** j**++)**

**{**

**for(**i**=**0**;** i**<=**y**;** i**++)**

**{**

a**[**i**][**j**]=**a**[**i**+**1**][**j**-**1**]-**a**[**i**][**j**-**1**];**

**}**

y**--;**

**}**

y**=**n**+**1**;**

cout**<<**endl**;**

cout**<<"x y ";**

**for(**i**=**1**;** i**<=**n**;** i**++)**

cout**<<"d^"<<**i**<<" ";**

cout**<<"\n\n";**

**for(**i**=**0**;** i**<=**n**;** i**++)**

**{**

**for(**j**=**0**;** j**<=**y**;** j**++)**

**{**

printf**("%.4f ",**a**[**i**][**j**]);**

**}**

y**--;**

cout**<<**endl**;**

**}**

cout**<<"\nEnter x of y(x):";**

cin**>>**x**;**

i**=**j**=**0**;**

x0**=**a**[**i**][**j**];**

h**=**a**[**i**+**1**][**j**]-**x0**;**

p**=(**x**-**x0**)/**h**;**

sum**=**a**[**i**][**j**+**1**]+**p**\***a**[**i**][**j**+**2**];**

**if(**n**>**2**)**

**{**

cout**<<"\n";**

**for(**i**=**2**;** i**<=**n**;** i**++)**

**{**

sum**=**sum**+((**pp**(**p**,**i**)\***a**[**0**][**i**+**1**])/**fact**(**i**));**

**}**

**}**

cout**<<"\n"<<"y("<<**x**<<") is: "<<**sum**<<**endl**;**

**return** 0**;**

**}**

**Sample input/output:**

