UTM

UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING

SEMESTER 1 2023/2024

SECJ1013 – DISCRETE STRUCTURE

SECTION 3

Lab Exercise 2– CHAPTER 2，3

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WRITE A C++ PROGRAM based on the tasks below:

- Set the values:

  x1 = 1; y1 = 3; x2 = 2; y2 = 6; x3 = 5; y3 = 4;

- Find the distance between every pair of points A(1, 3), B(2, 6), and C(5, 4) using Euclidean Distance Formula.
- The output of the program:

  A(1, 3), B(2, 6), and C(5, 4)

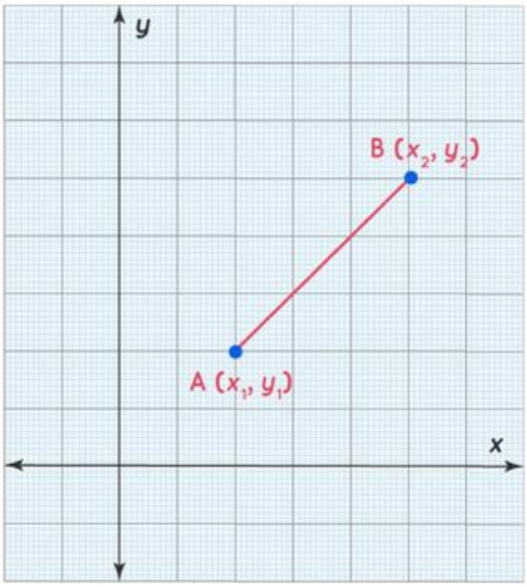
	x	y
A	1	3
B	2	6
C	5	4

AB =

AC =

BC =

Euclidean Distance Formula



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

C++ programme

```cpp
//tanzhiming a23cs0189
//lab exercise 2
#include <iostream>
#include <cmath>
#include <cstring>
using namespace std;

double euclideanDistance(int, int, int ,int);
void displayTop();
void displayMatrix();
void displayAlpha();
int main(){
    displayTop();
    displayMatrix();
    //chapter 2 postfix
    //chapter 3 for loop
    for (int i=0; i <3 ;i++){
        displayAlpha();
        switch (i)
        {
        case 0 : cout<<euclideanDistance(1,3,2,6);
            break;
        case 1 : cout<<euclideanDistance(1,3,5,4);
            break;
        default: cout<<euclideanDistance(2,6,5,4);
            break;
        }
        cout<<endl;
    }
    system("pause");
    return 0;

}

void displayTop(){
    char string1[20] = "A(1,3),";
    char string2[20] = " B(2,6), and ";
    char string3[20] = "C(5,4)";

    strcat(string1,string2);
    strcat(string1,string3);
    cout<<string1<<endl;
}
```

```
void displayMatrix(){
    cout<<"         x        y"<<endl;
    cout<<"A        1        3"<<endl;
    cout<<"B        2        6"<<endl;
    cout<<"C        5        4"<<endl;
}


void displayAlpha(){
    static int q=0; // chapter 4 lesson
    switch (q)
    {
    case 0 : cout<<"AB = ";
        break;
    case 1 : cout<<"AC = ";
        break;
    default: cout<<"BC = ";
        break;
    }
    q++;
}

double euclideanDistance(int a , int b , int c , int d) {
    double result;
    result = sqrt(pow((c - a), 2) + pow((d - b), 2));
    return result;
}
```

```
//tanzhiming a23cs0189
//lab exercise 2
#include <iostream>
#include <cmath>
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using namespace std;

double euclideanDistance(int, int, int ,int);
void displayTop();
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int main(){
  displayTop();
  displayMatrix();
  //chapter 2 postfix
  //chapter 3 for loop
  for (int i=0; i <3 ;i++){
    displayAlpha();
    switch (i)
```

```
      {
      case 0 : cout<<euclideanDistance(1,3,2,6);
        break;
      case 1 : cout<<euclideanDistance(1,3,5,4);
        break;
      default: cout<<euclideanDistance(2,6,5,4);
        break;
      }
      cout<<endl;
   }
   system("pause");
   return 0;

}

void displayTop(){
   char string1[20] = "A(1,3),";
   char string2[20] = " B(2,6), and ";
   char string3[20] = "C(5,4)";

   strcat(string1,string2);
   strcat(string1,string3);
   cout<<string1<<endl;
}
void displayMatrix(){
   cout<<"       x      y"<<endl;
   cout<<"A      1      3"<<endl;
   cout<<"B      2      6"<<endl;
   cout<<"C      5      4"<<endl;
}
void displayAlpha(){
   static int q=0; // chapter 4 lesson
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   case 0 : cout<<"AB = ";
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   default: cout<<"BC = ";
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   }
   q++;
}
double euclideanDistance(int a , int b , int c , int d) {
   double result;
   result = sqrt(pow((c - a), 2) + pow((d - b), 2));
   return result;
}
```

OUTPUT:


C:\Lab Exercise 2\main.exe
A(1,3), B(2,6), and C(5,4)
x y
A 1 3
B 2 6
C 5 4
AB = 3.16228
AC = 4.12311
BC = 3.60555
Press any key to continue . . .