PRI LAB 3

BY

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PALINDROME

3 PALINDROME

- Problem:
  - Is palindrome?
- Sample Input:
  - Abcdcba
  - qwe
- Sample Output:
  - Yes
  - No

4 PALINDROME SOLUTION VERSION 1 (CHAR)

```
char a[100];
int i = 0, j = 0;
cout << "Enter a sentence and when you finish press (;)=";
cin >> a[i];
while (a[i] != ';'){
    i++;
    cin >> a[i];
}
i--;
while (i>j){
    if (a[i] == a[j]){
        i--;
        j++;
    }
    else{
        cout << "No, not a palindrome " << endl;
        exit(0);
    }
}
cout << "Yes, it is a palindrome " << endl;
```

5 PALINDROME SOLUTION VERSION 2 (STRING)

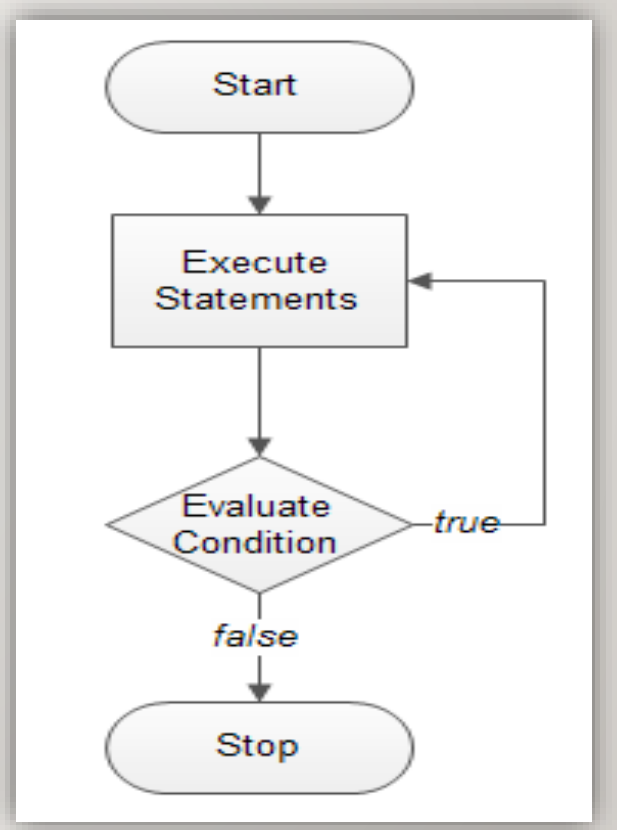
```
string str="abcdcba";
int i=0,j=str.size()-1;
bool isPal=true;
while(i<j){
    if(str[i]!=str[j]){
        isPal=false;
    }
    i++;
    j--;
}
cout<<isPal<<endl;
```

DO WHILE LOOP

7 DO WHILE LOOP

- Similar to while structure:
  - Makes loop continuation test at end, not beginning.
  - Loop body executes at least once.
- Format:

```
do {
        statement
} while ( condition );
```



DO WHILE LOOP EXAMPLE

```
char ch;
do
{
    cout << "press Q or q to quit,any other to continue= ";
    cin >> ch;
    if (ch != 'Q' && ch != 'q')
        cout << "you want to continue" << endl;
    else
        cout << "you quit ! " << endl;
} while (ch != 'Q' && ch != 'q');
```

SWITCH

10 SWITCH

- Its objective is to check several possible constant values for an expression, something similar to using of several if and else if sentences.
- Data type & switch:
  - Can use: char, int, bool, short, long, byte.
  - Cant use: double, float.

11 SWITCH FORMAT

```
switch (expression) {
  case constant1:
    block of instructions 1
    break;
  case constant2:
    block of instructions 2
    break;
  .
  .
  .
  default:
    default block of instructions
  }
```

SWITCH VS IF STATEMENT

```
if (x == 1) {
  cout << "x is 1";
  }
else if (x == 2) {
  cout << "x is 2";
  }
else {
  cout << "value of x unknown";
  }
```

```
switch (x) {
  case 1:
    cout << "x is 1";
    break;
  case 2:
    cout << "x is 2";
    break;
  default:
    cout << "value of x unknown";
  }
```

13 SWITCH EXAMPLE

```
char grade = 'D';
switch (grade) {
case 'A':
     cout << "Excellent!" << endl;
     break;
case 'B':
case 'C':
     cout << "Well done" << endl;
     break;
case 'D':
     cout << "You passed" << endl;
     break;
case 'F':
     cout << "Better try again" << endl;
     break;
default:
     cout << "Invalid grade" << endl;
}
cout << "Your grade is " << grade << endl;
```

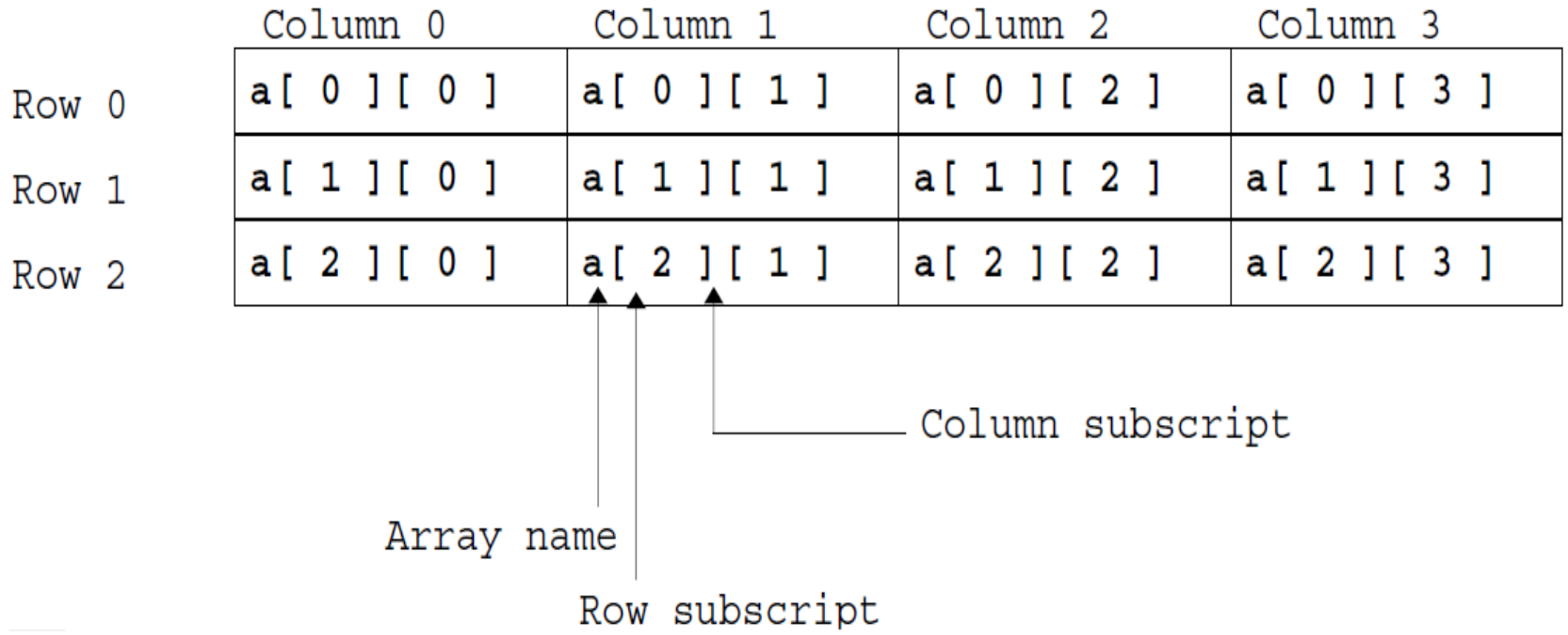
2D ARRAY

15 2D ARRAY

- Syntax:
  - array [i] [j]
  - Tables with rows and columns
  - Specify row, then column
  - array [0] : is an array of 4 elements
  - array [0] [0] : is the first element of the array
- Initialization:
  - int a[2][2]={{1,2},{3,4}};

1	2
3	4

16 2D ARRAY


Column 0
Column 1
Column 2
Column 3
Row 0
Row 1
Row 2
a[0][0]
a[0][1]
a[0][2]
a[0][3]
a[1][0]
a[1][1]
a[1][2]
a[1][3]
a[2][0]
a[2][1]
a[2][2]
a[2][3]
Column subscript
Array name
Row subscript

2D ARRAY EXAMPLE (INPUT & OUTPUT)

```
int a[5][3];
cout << "enter the element of the array:" << endl;
for (int i = 0; i<5; i++)
    for (int j = 0; j<3; j++)
        cin >> a[i][j];

for (int i = 0; i<5; i++)
{
    for (int j = 0; j<3; j++)
        cout << a[i][j] << "   ";
    cout << endl;
}
```

EXERCISES
SUM OF ARRAY

- Problem 1:
  - Write a program that print the sum of 2D array
- Problem 2:
  - Write a program that print the sum of each row of 2D array

HOMEWORK'S

HOMEWORK 1

- Problem:
  - Find the sum of squares of numbers from 1 to n.
- Sample Input:
  - 4
- Sample Output:
  - 30

HOMEWORK 2

- Problem:
  - Encrypt a sentence by shifting its characters 3 steps each.
- Sample Input:
  - ab zx 22 dr.
- Sample Output:
  - de ca 22 gu.

HOMEWORK 3

- Problem:
  - Calculate the factorial.
- Sample Input:
  - 3
  - 1 5 10
- Sample Output:
  - 1 120 3628800

23 HOMEWORK 4

- Problem:
  - Write a program that takes two 2D arrays as input (the two array have the same number of rows and columns) and output anew 2D array that contains their sum

24 THE END