



**MUST**  
                  
**Wisdom & Virtue**

MIRPUR UNIVERSITY OF SCIENCE AND TECHNOLOGY  
DEPARTMENT OF SOFTWARE ENGINEERING

# Program Flow Types, Dijkstra's Game

*(Lecture # 3)*



***Engr. Samiullah Khan***  
*(Lecturer)*

# LECTURE CONTENTS

- Program Flow Types
- Program Flow Examples
- Dijkstra's Game



# Program to test for two equal strings

- Test cases:
  - isEqual (“cat”, “dog”) - expected **false**
  - isEqual (“Testing”, “Testing”) - expected **true**
  - isEqual (“house”, “home”) - expected **false**



# Program to check if two Strings are Equal

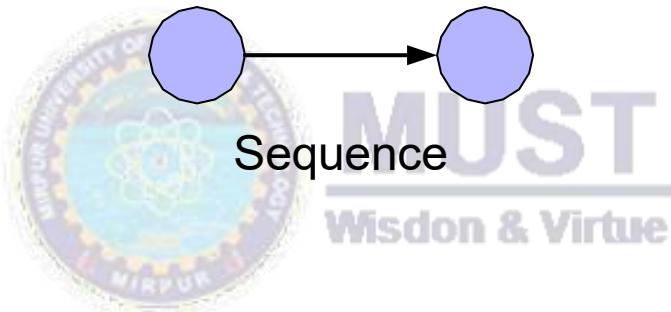
```
equal = strlen(string1) == strlen(string2);
if (equal)
    for (i = 0; i < strlen(string1); i++)
        equal = string1[i] == string2[i];
return equal;
```



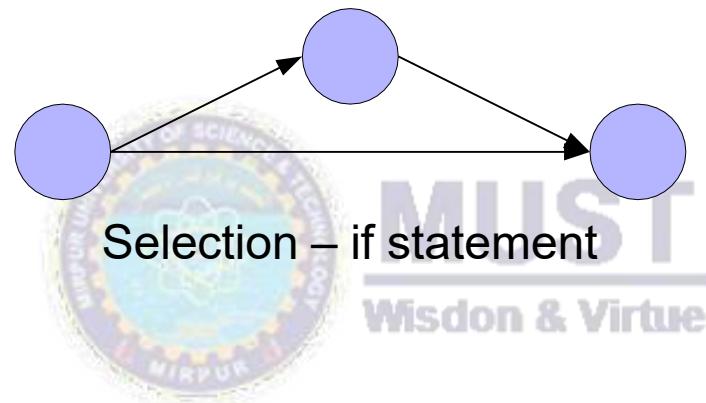
This code checks **if two strings are equal**:

1. First compares their lengths.
2. If lengths match, compares each character.
3. Returns true (1) if all match, otherwise false (0).

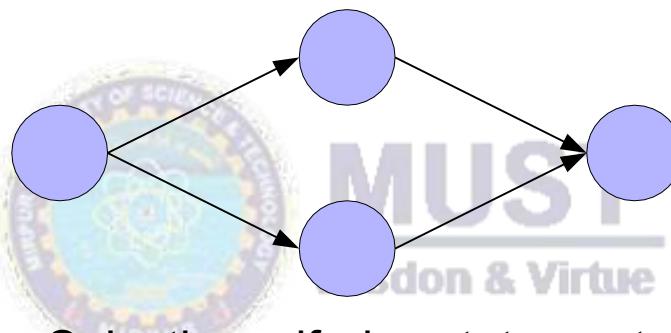
# Program Flow



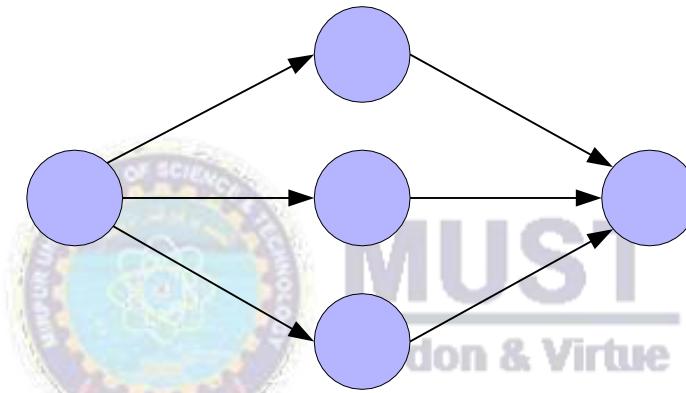
# Program Flow



# Program Flow

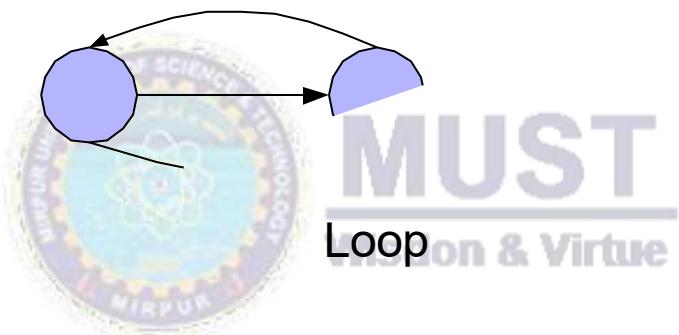


# Program Flow



Selection – case statement

# Program Flow

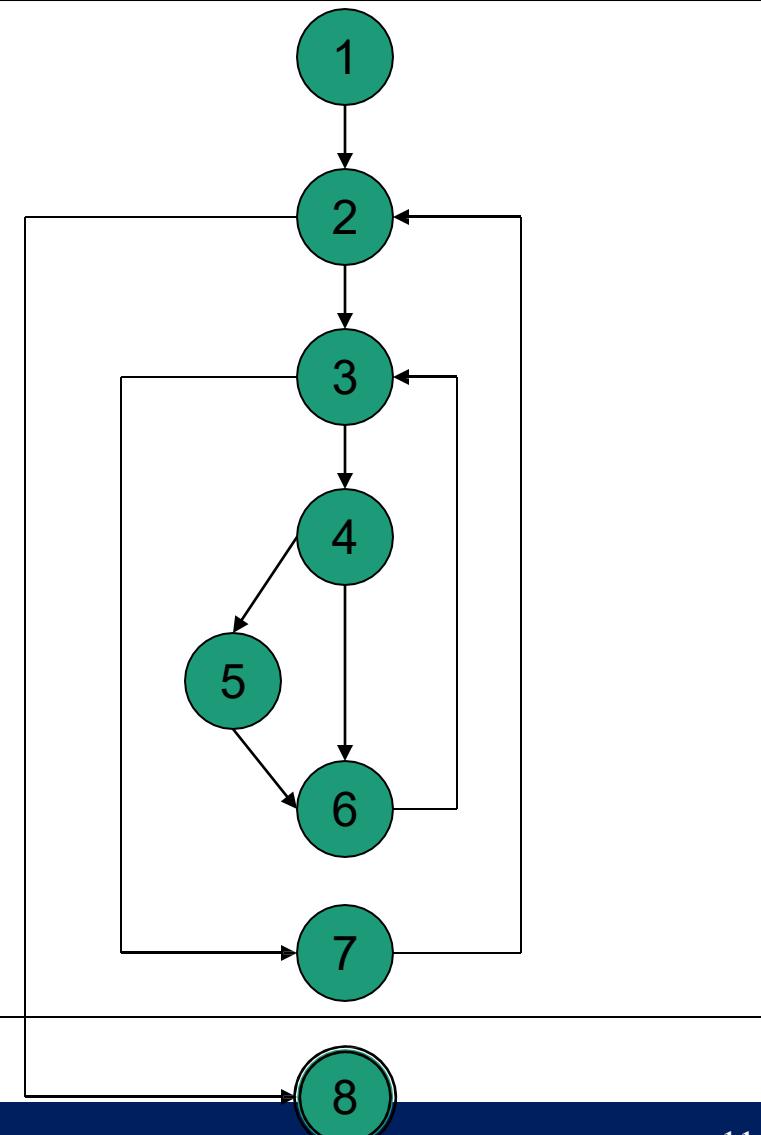


# Flow graph for bubble sort

```
sorted = false;           // 1
while (!sorted) {         // 2
    sorted = true;
    for (int i = 0; i < SIZE-1; i++) { // 3
        if (a[i] > a[i+1]) {           // 4
            swap(a[i], a[i+1]);       // 5
            sorted = false;
        }
    }                               // 6
}                                 // 7
//8
```

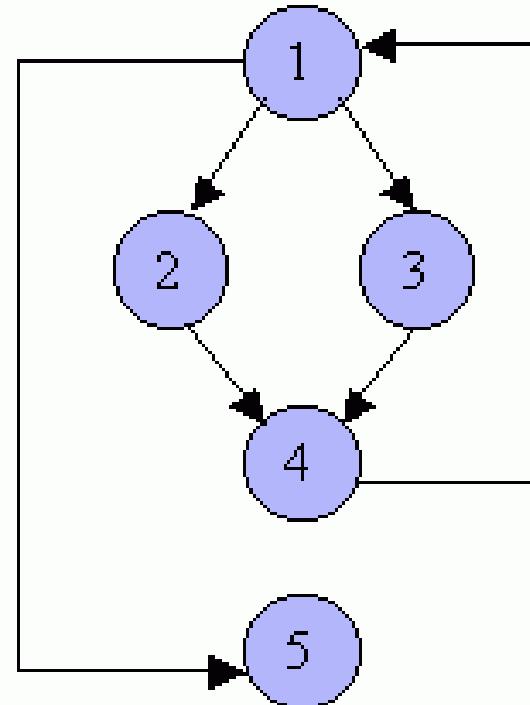


MUST  
Wisdom & Virtue



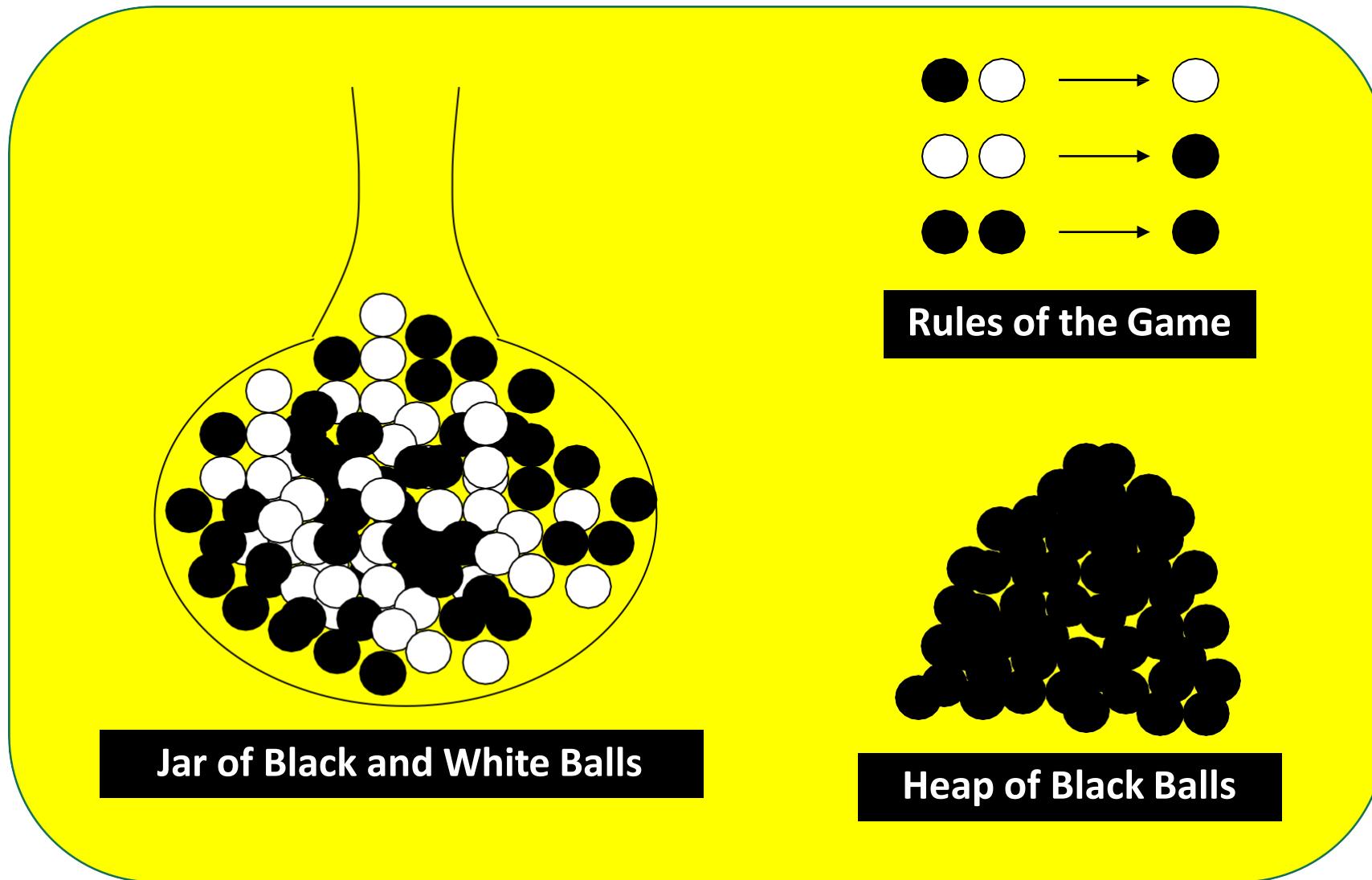
```
for (i = 0; i < N; i++) {  
    if (condition1)  
        // do something here  
    else  
        // do something here  
    // something here  
}
```

//1  
//2  
//3  
//4  
//5

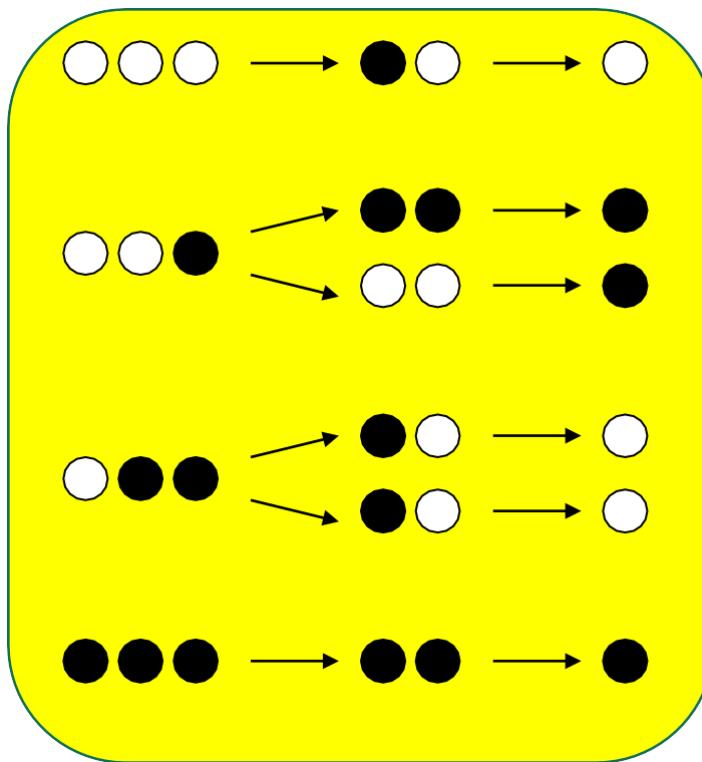


$2^N$  Paths

# Dijkstra's Game



# A THREE-BALL GAME



# Mathematical Model

$$f(b,w) = \begin{cases} (2 \text{ black out, 1 black in}) & b-2+1, w \equiv b-1, w \\ (2 \text{ white out, 1 black in}) & b+1, w-2 \\ (1 \text{ of each out, 1 white in}) & b-1, w-1+1 \equiv b-1, w \end{cases}$$



**MUST**

- Total number of balls is reduced by exactly one in each move.
- Parity of the white ball does not change

Thanks