



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



MUST
Wisdom & Virtue

Program to test for two equal strings

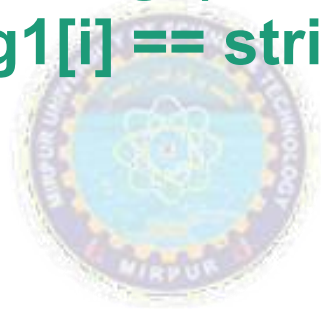
- Test cases:

- 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;
```

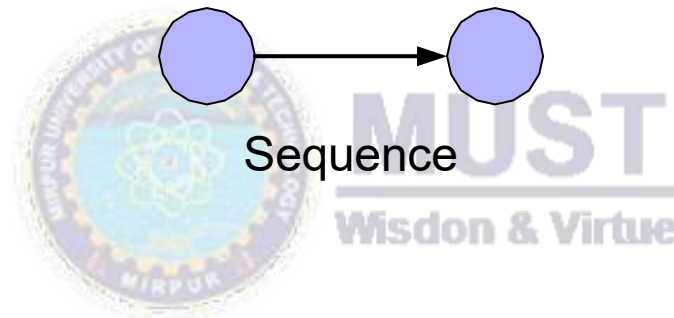


MUST
Wisdom & Virtue

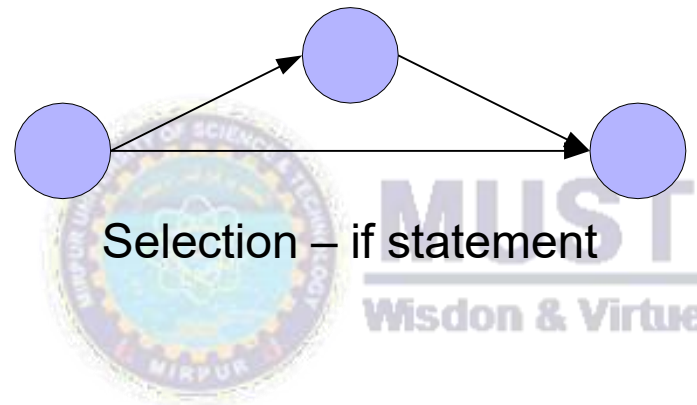
This code checks **if two strings are equal**:

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

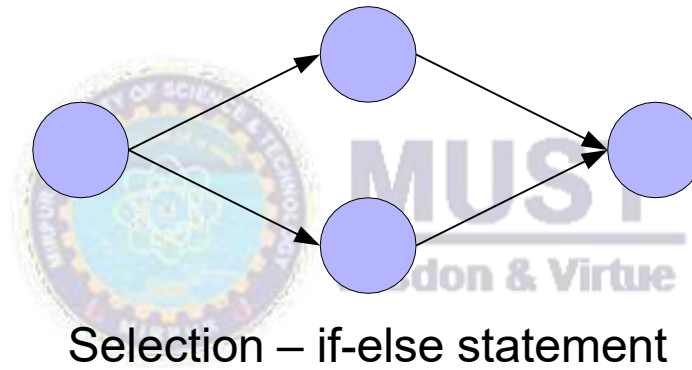
Program Flow



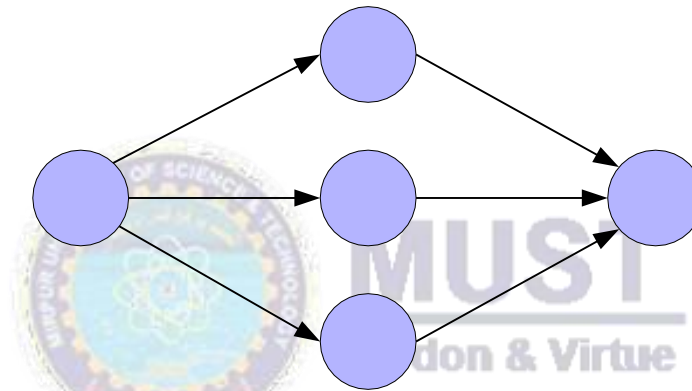
Program Flow



Program Flow

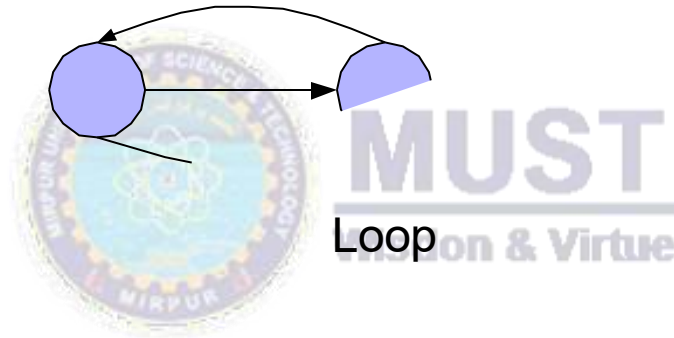


Program Flow



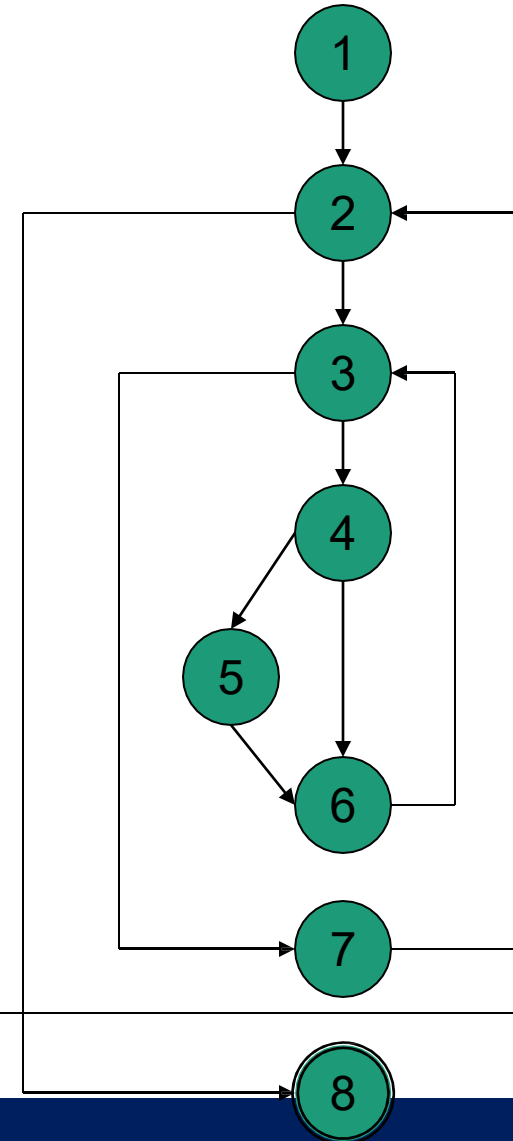
Selection – case statement

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
```



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

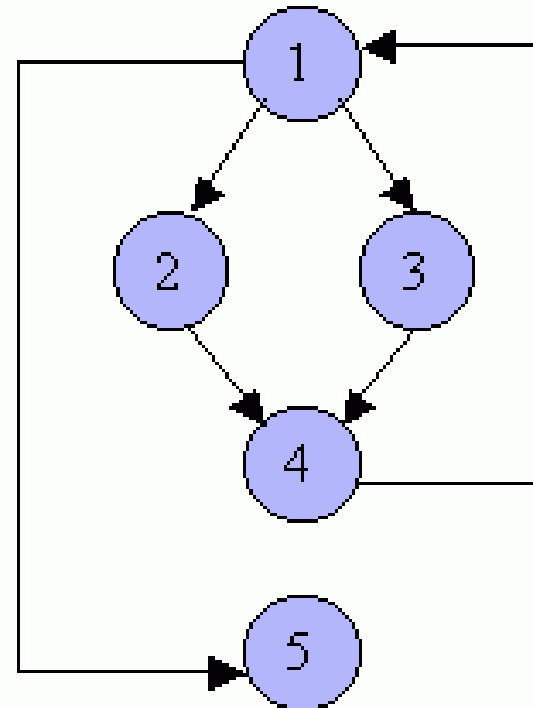
//1

//2

//3

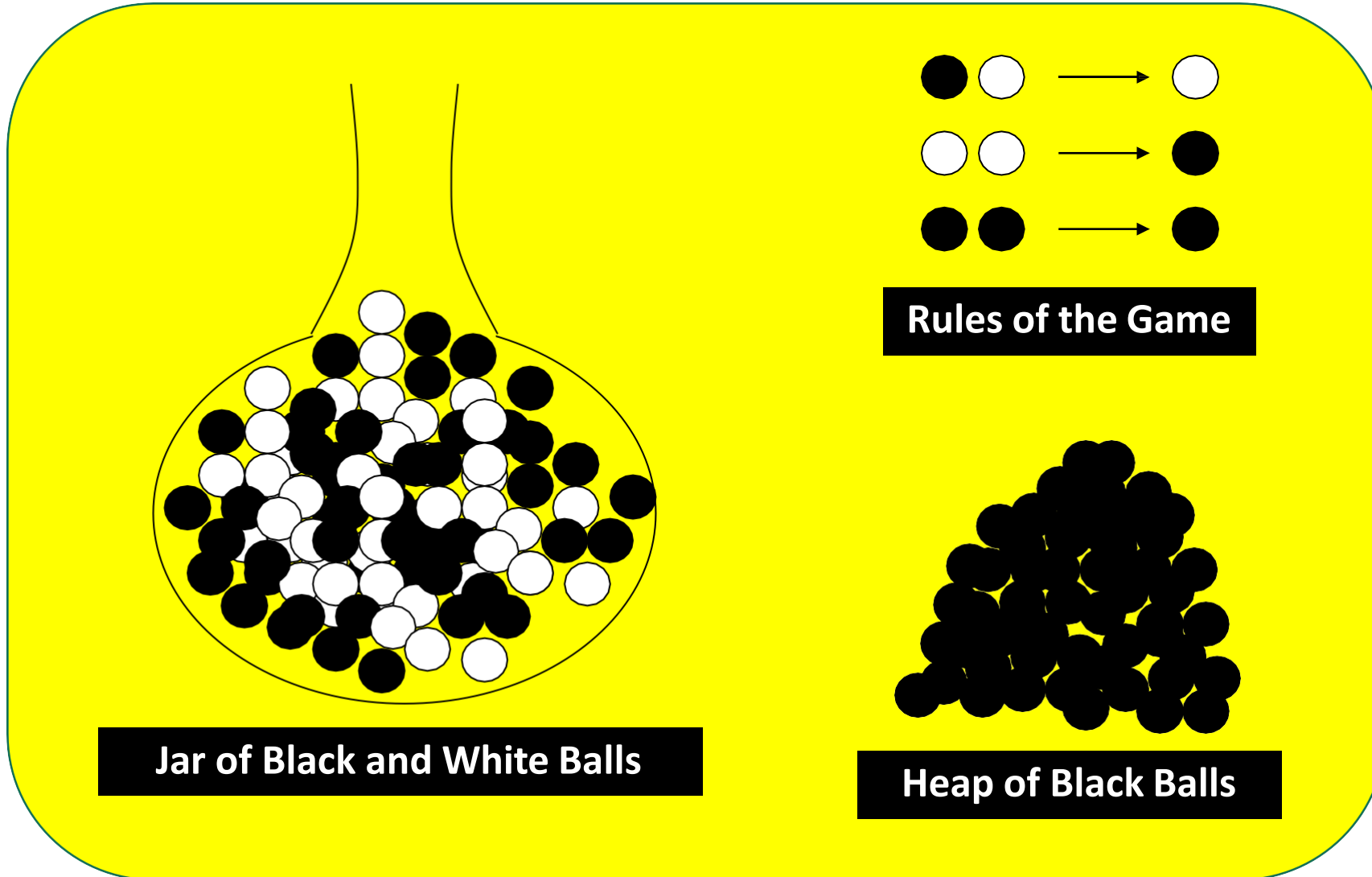
//4

//5

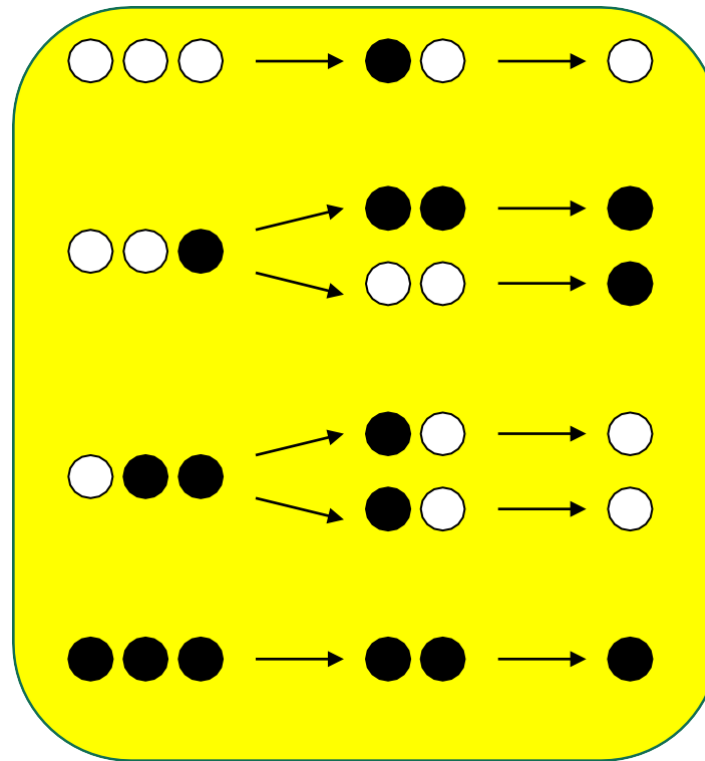


2^N Paths

Dijkstra's Game



A THREE-BALL GAME



Mathematical Model

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



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

Thanks