Basic Program Structure
More on Selection (Branching)

Lesson Objectives

At the end of this lesson, you should be able to:

- Apply the following selection (branching) structures:
  - IF-ELSE statement
  - Nested IF statement
- Use Logical/ Boolean Operators to chain expressions

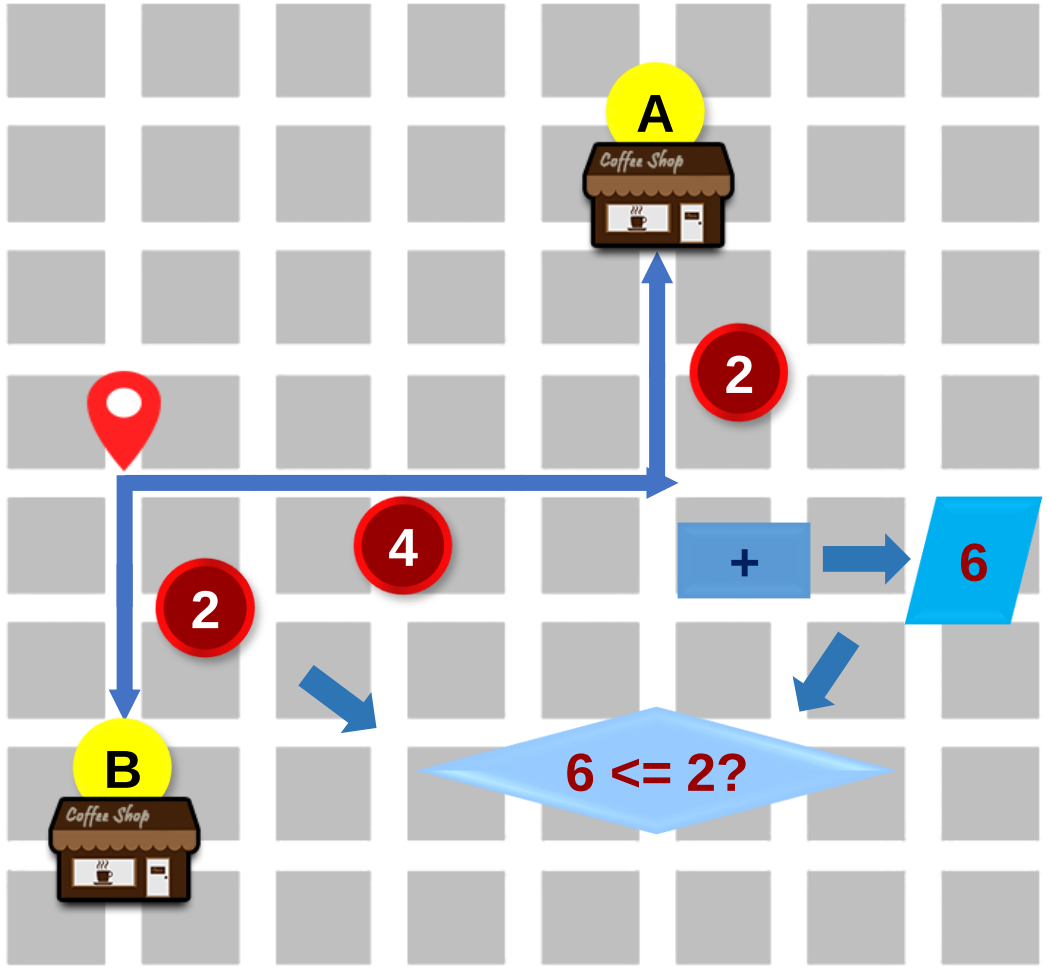
Topic Outline

IF-ELSE Statement

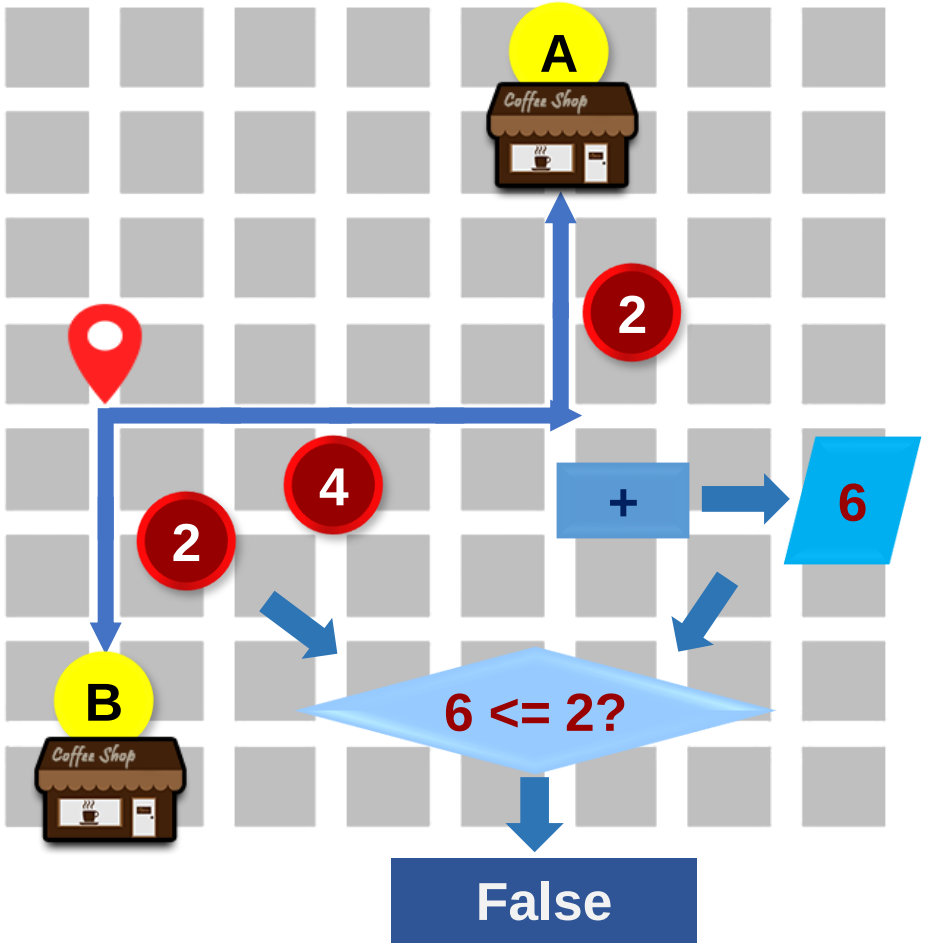
Boolean Operators

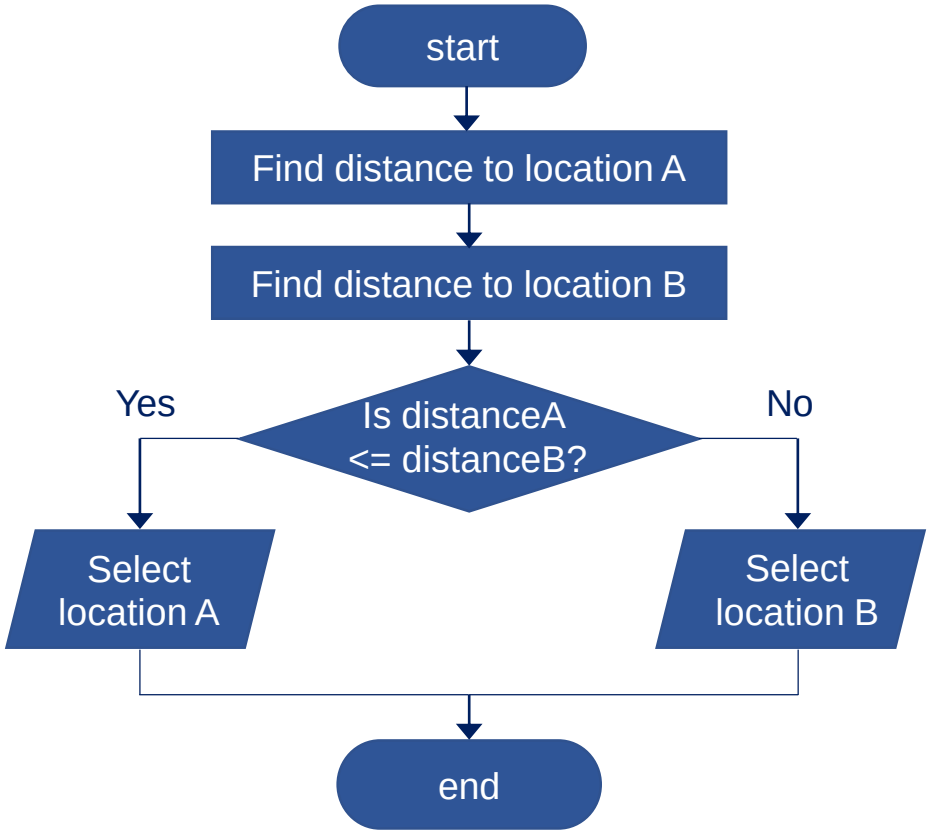
Nested IF Statement

Scenario 5: Find the Nearer Coffee Shop



Scenario 5: Find the Nearer Coffee Shop (Cont'd)





IF-ELSE Statement

A single IF-ELSE statement in the top level

Pseudocode

```
IF condition is True
THEN
    SUITE1
ELSE
    SUITE2
END IF
...
```

Execute the True part if the condition is True.

Note the same amount of indentation used.

Execute the False part if the condition is False.

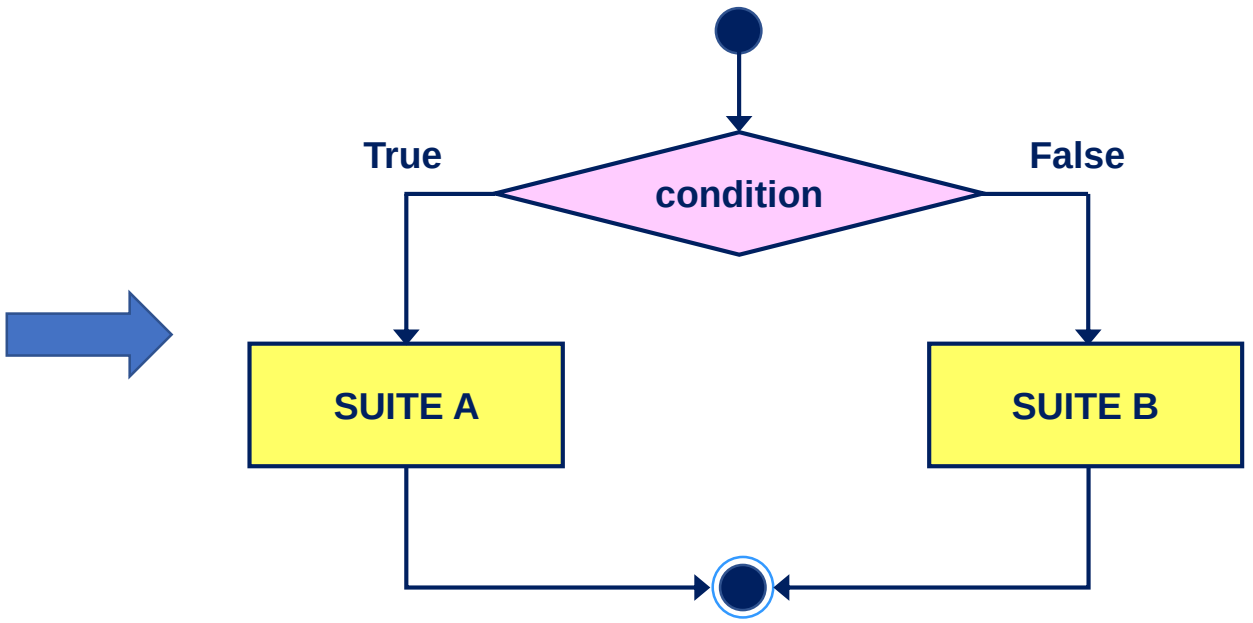
Continue the sequence by executing the next instruction.

IF-ELSE Statement (Cont'd)

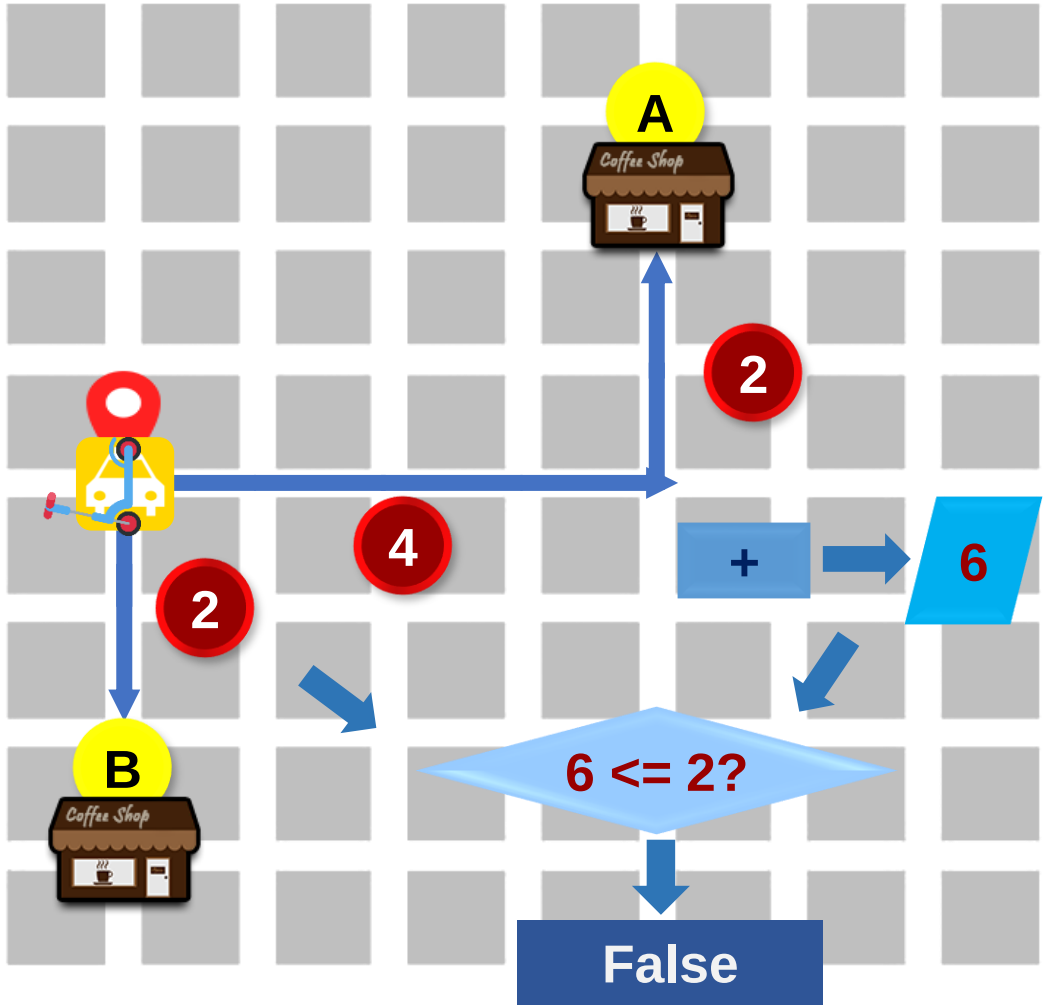
Alternatively, when visualized as a flowchart:

Pseudocode

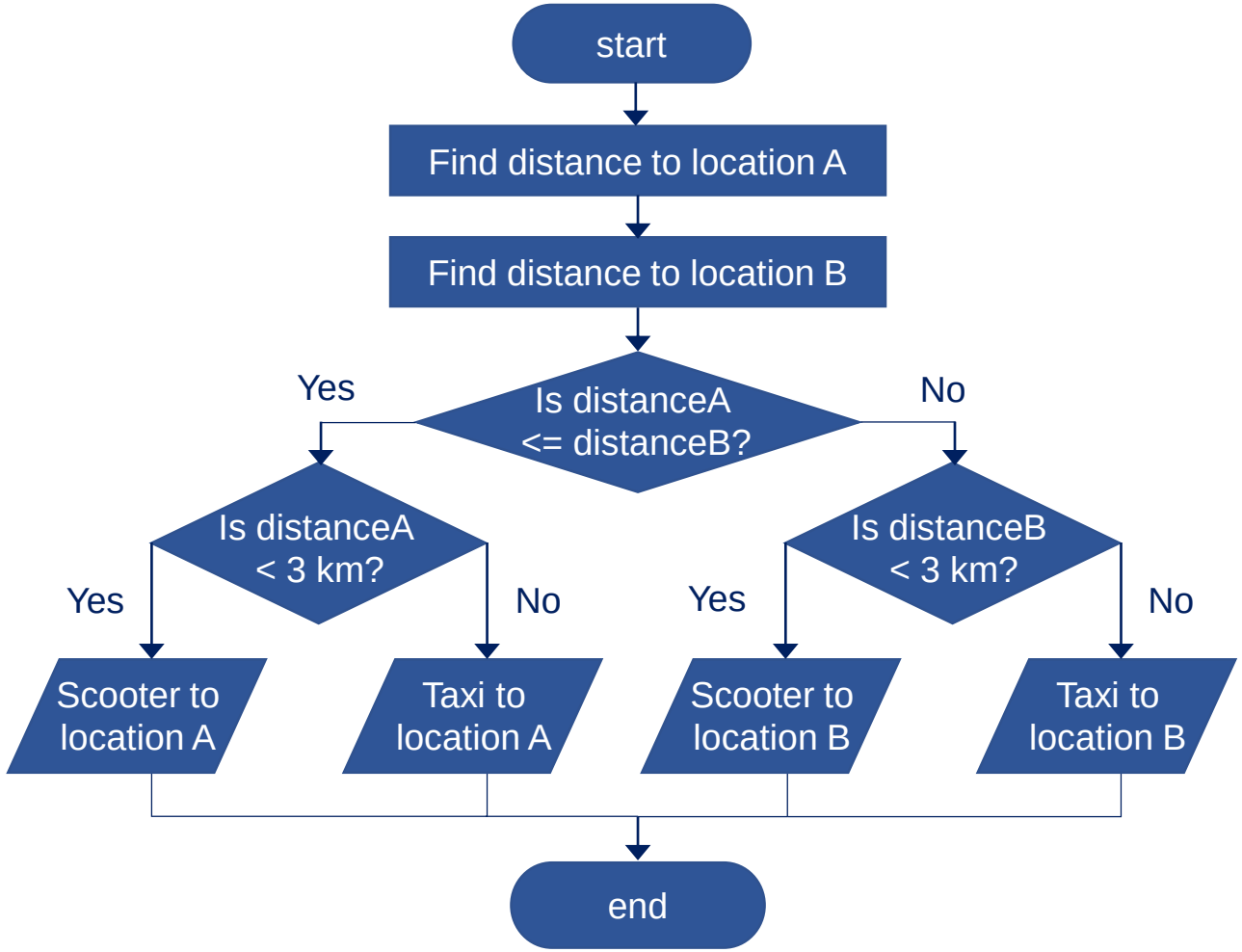
```
IF condition is True
THEN
      SUITE A
ELSE
      SUITE B
END IF
...
```

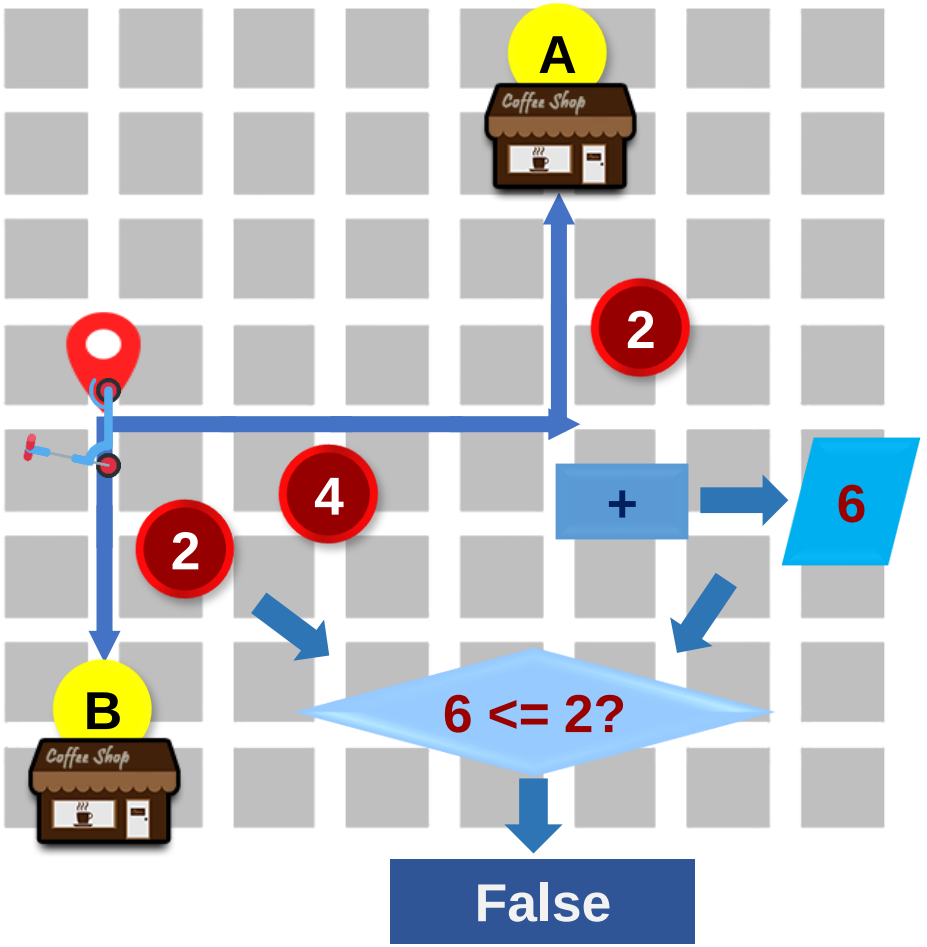


Scenario 6: Decide Transportation to the Nearer Coffee Shop



Scenario 6: Decide Transportation to the Nearer Coffee Shop





IF Statement

Pseudocode

```
IF condition1 is True THEN
      DO THIS SUITE
END IF
...
```

For each IF statement, there is an associated block for its True part.

Logical/ Boolean Operators

Logical operators connect Boolean values and expressions and **return** a Boolean value as a result.

A	B	not A	A and B	A or B
False	False	True	False	False
False	True	True	False	True
True	False	False	False	True
True	True	False	True	True

Operator	Example	Meaning
not	**not** num < 0	**Flip T/ F**
and	(num1 > num2) **and** (num2 > num3)	**Return True only if both are True**
or	(num1 > num2) **or** (num2 > num3)	**Return True if either one is True**

Quick Check

What is the value of the given expression?

```
(not(10>=20) and not(10<30)
```

Quick Check: Answer

What is the value of the given expression?

```
(not(10>=20) and not(10<30))
```

Answer **False**

Nested IF Statement

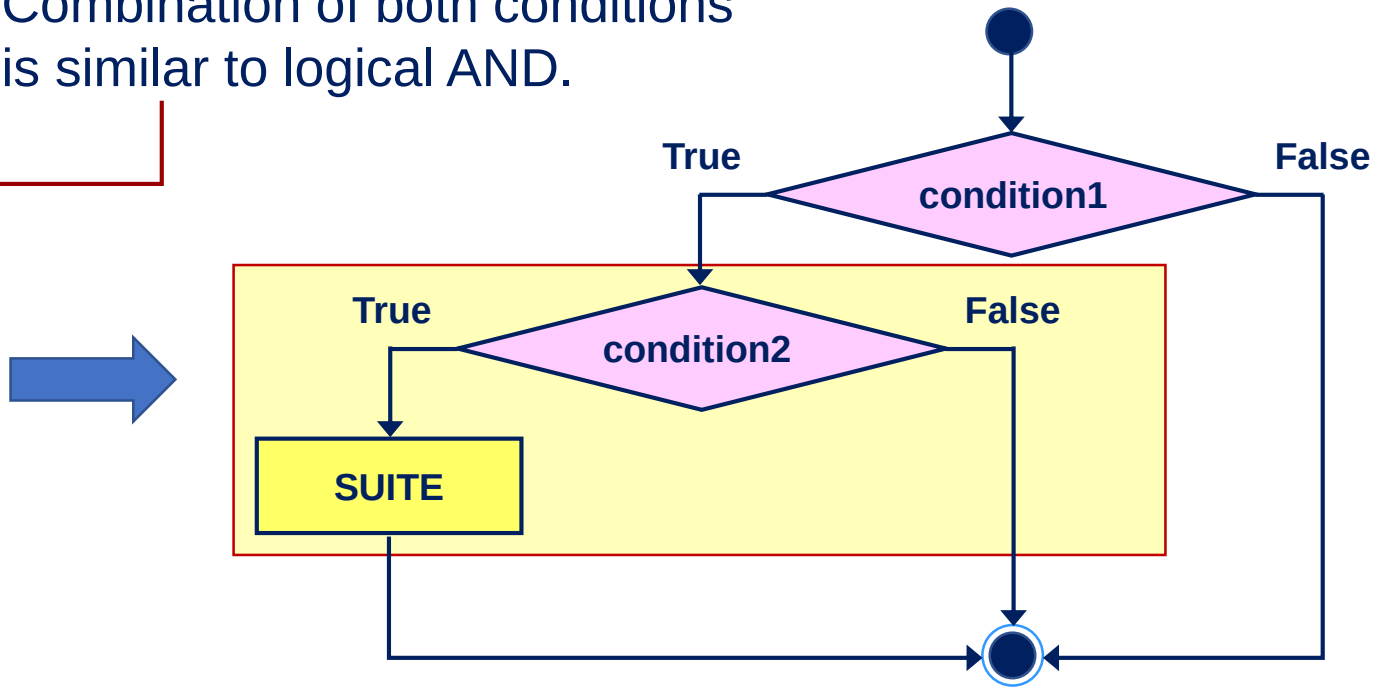
Inside the True Block

Can there be another IF statement(s) inside the True Block?

Pseudocode

```
IF condition1 is True THEN
  IF condition2 is True THEN
    DO THIS SUITE
  END IF
END IF
...
```

Combination of both conditions is similar to logical AND.



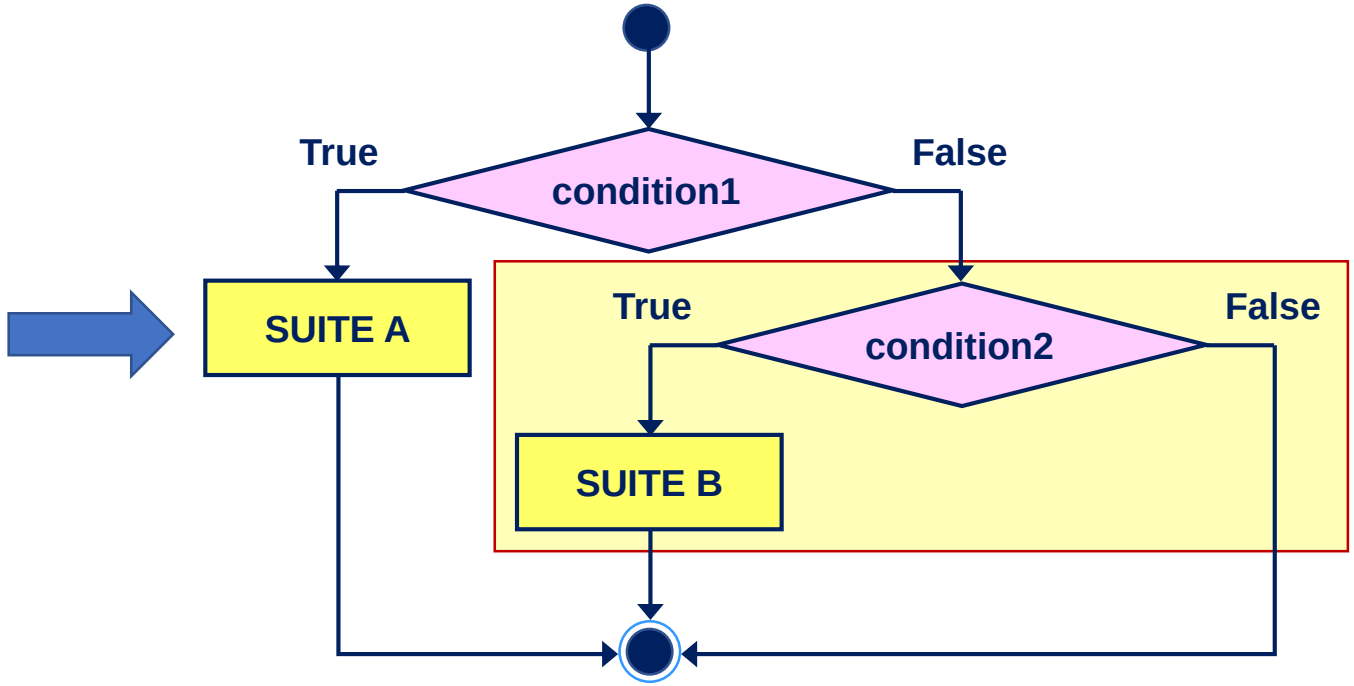
Nested IF Statement (Cont'd)

Inside the False Block

Can there be another IF statement(s) inside the **False Block**?

Pseudocode

```
IF condition1 is True THEN
        DO SUITE A
ELSE    IF condition2 is True THEN
          DO SUITE B
        END IF
END IF
...
```



Nested IF Statement (Cont'd)

Inside the True Block of the True Block

Can there be another IF statement(s) inside the True Block of a True Block?

Pseudocode

```
IF condition1 is True THEN
  IF condition2 is True THEN
    IF condition3 is True THEN
      DO THIS SUITE
    END IF
  END IF
END IF
...
```

We do this only if condition1, condition2, and condition3 are true, similar to logical AND.

Try creating its equivalent flowchart.

Use the previous flowchart as a reference.

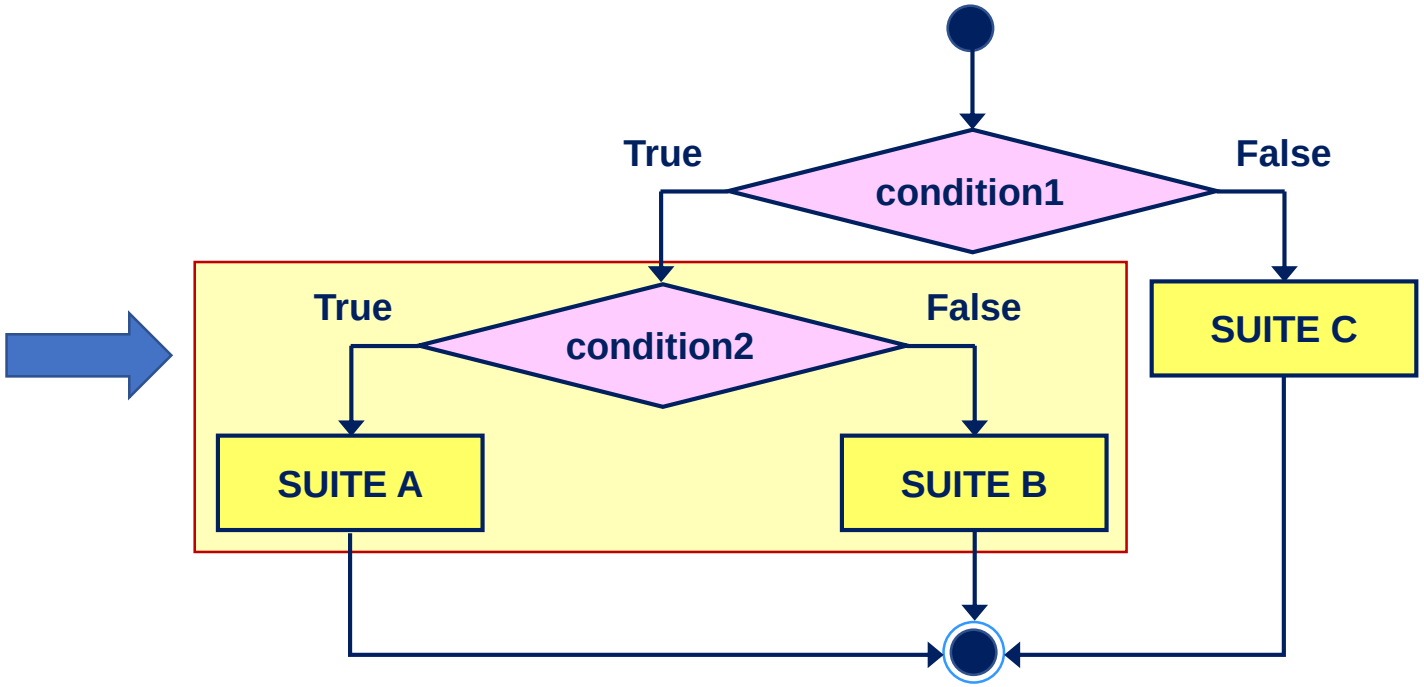
Nested IF Statement (Cont'd)

IF-ELSE Statement(s) Inside the True Block

Can there be another IF-ELSE statement(s) inside the True Block?

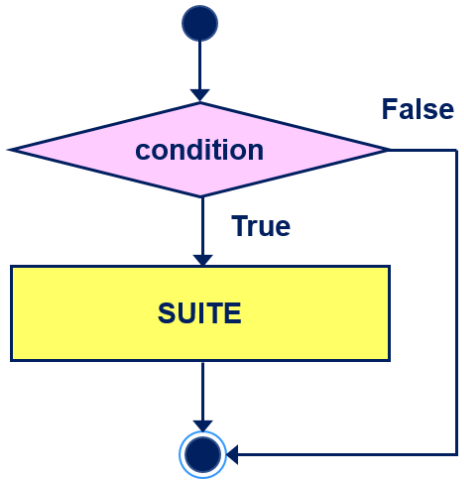
Pseudocode

```
IF condition1 is True THEN
      IF condition2 is True THEN
            DO SUITE A
      ELSE
            DO SUITE B
      END IF
ELSE
      DO SUITE C
END IF
...
```

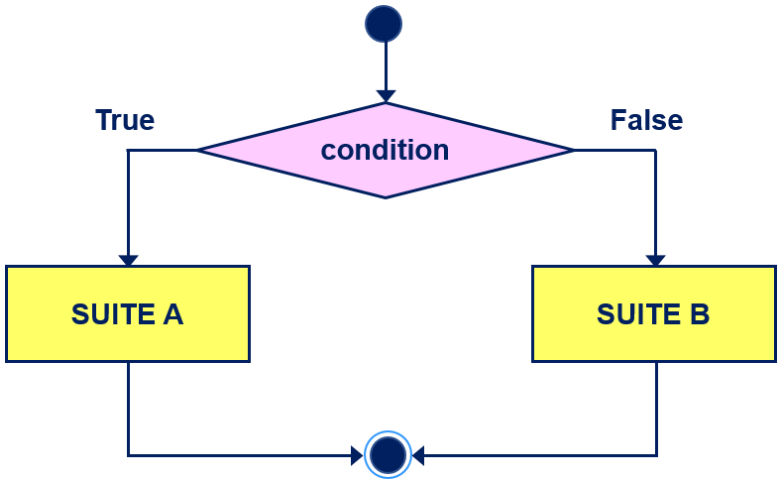


Summary

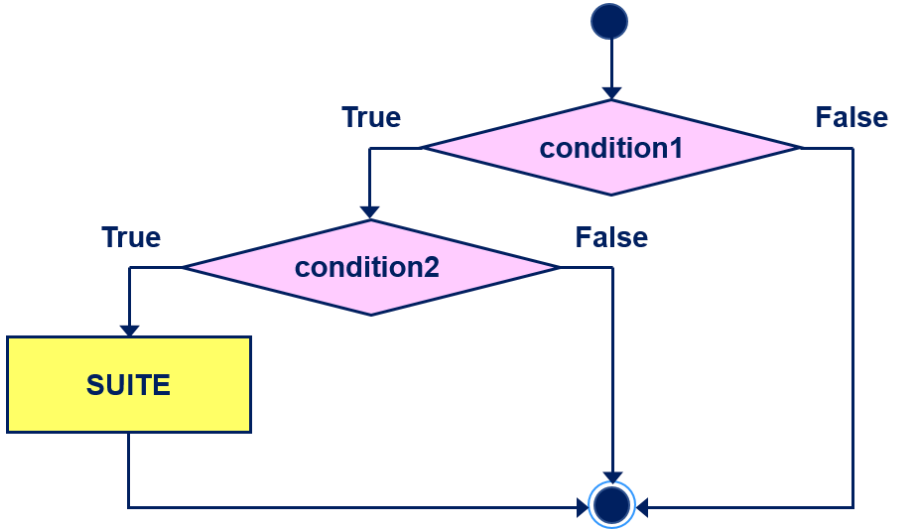
IF Statement



IF-ELSE Statement



Nested IF Statement



References for Images

No.	Slide No.	Image	Reference
1	11		Search [Online Image]. Retrieved April 18, 2018 from https://pixabay.com/en/database-search-database-search-icon-2797375/.
2	16, 17, 18, 19		Question problem [Online Image]. Retrieved April 18, 2018 from https://pixabay.com/en/question-problem-think-thinking-622164/.
3	9, 10		By Twitter, CC BY 4.0, retrieved April 18, 2018 from https://commons.wikimedia.org/w/index.php?curid=59970363.
4	17		Survey icon [Online Image]. Retrieved April 18, 2018 from https://pixabay.com/en/survey-icon-survey-icon-2316468/.