

4

Conditional Statements

by
CSA 101 : Problem Solving with
Programming

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Conditional Statements

Simple if Statement



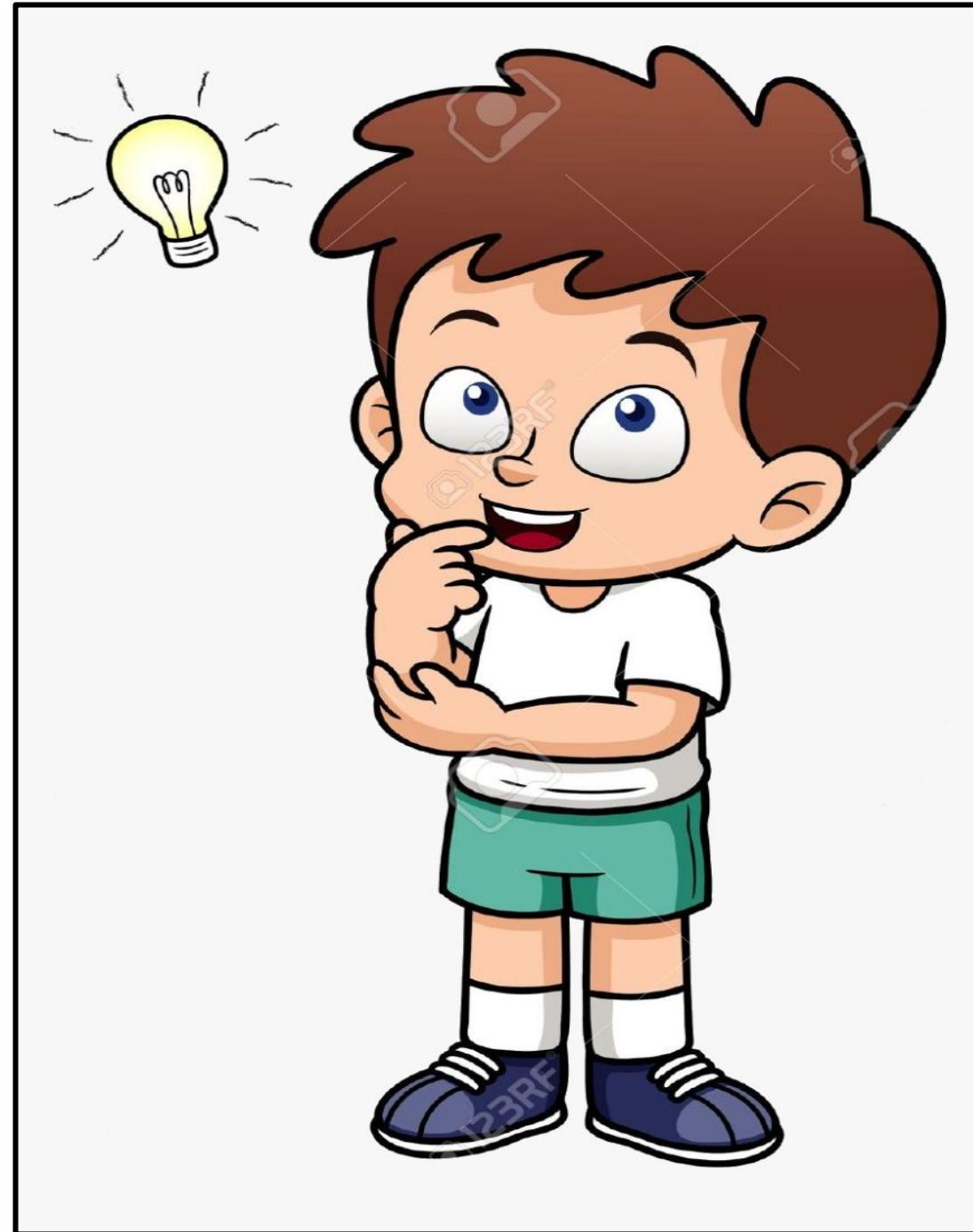
Newton's Apple :

Newton's mom was busy preparing for a special dinner that evening because some of her closest friends were coming over. She wanted to make a fresh fruit salad to serve as a light and delicious dessert. She called out to Newton and said:

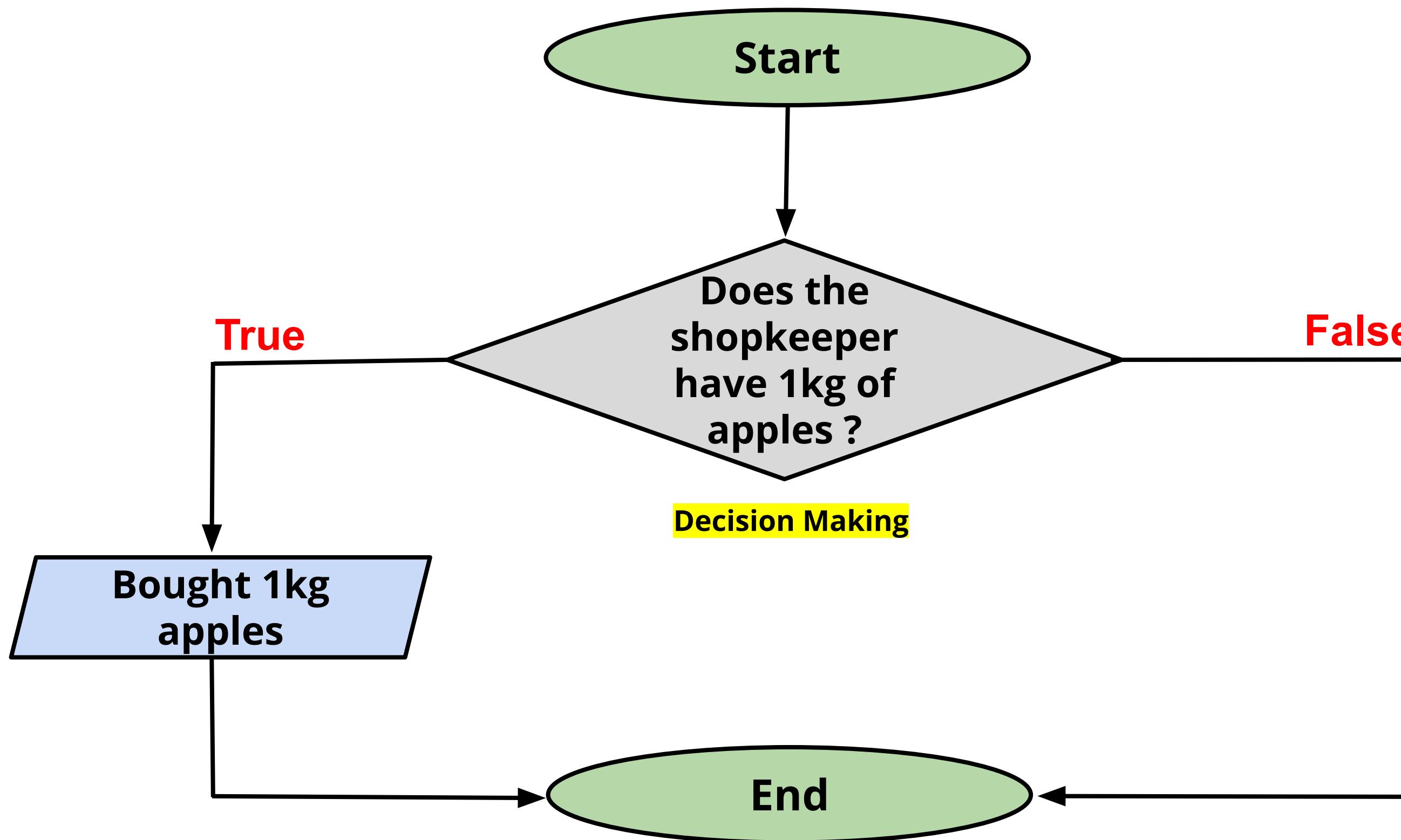
“Newton, please go to the market and bring 1kg apples if the shopkeeper has them.”



What steps does Newton follow to complete his mom's task ?



Flow Chart :



Simple if Statement :

- The if statement **executes a block of code only when the condition is True**.
- If the condition is **False**, the if block is skipped and the next statement in the program runs.

Syntax

```
if condition:  
    # Code to execute if condition is True  
  
    # Next statement (executes regardless of condition)
```

Indentation

Question - 1 : Newton's apple

Newton's mom is preparing a fruit salad. She told him:

"Go to the shop. If the shopkeeper has apples, buy 1 kg of apples."

Your task is to write a program that takes the shopkeeper's response and prints the appropriate action.

Example 1 : Yes

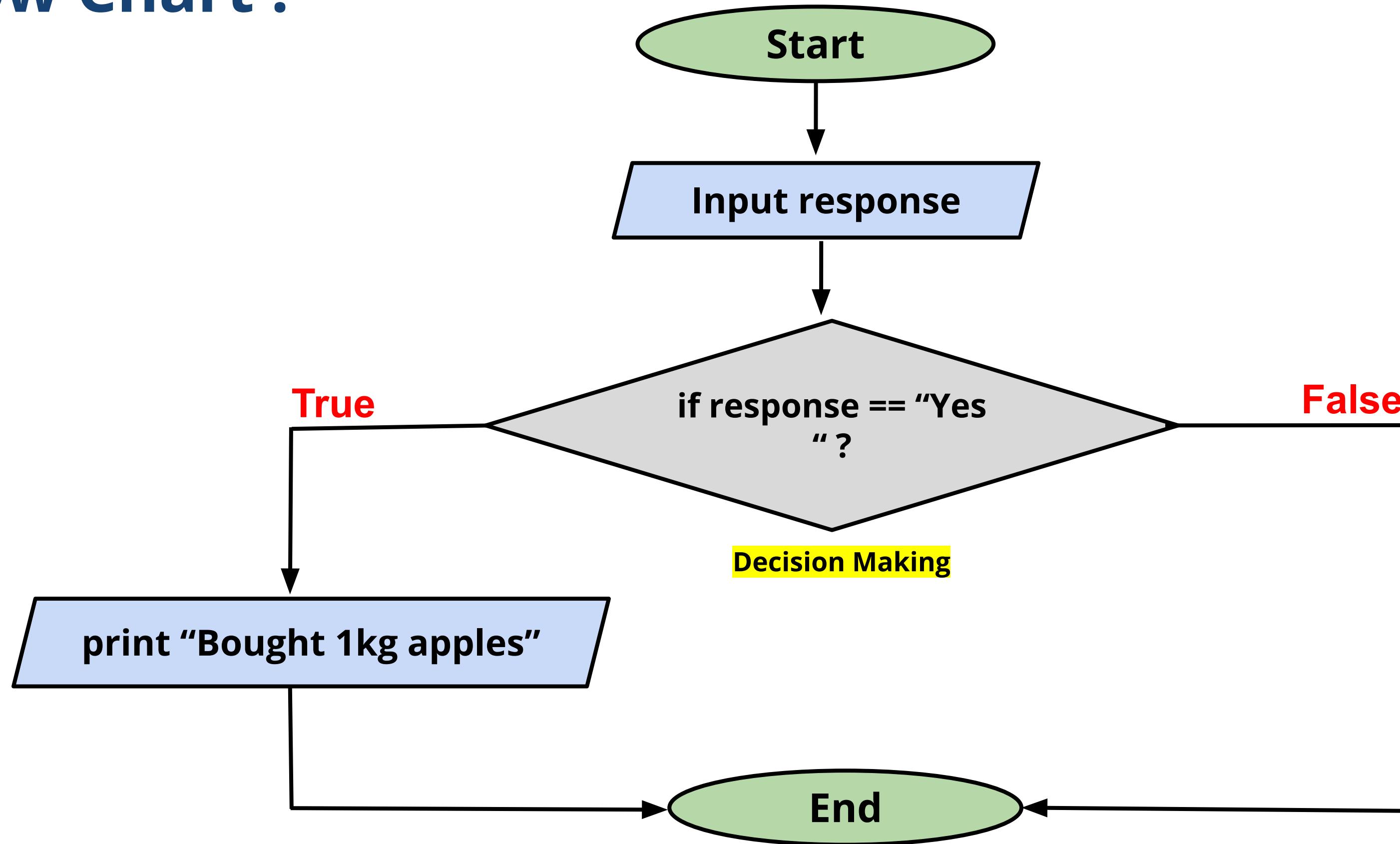
Output : Bought 1kg apples

Example 2 : No

Output : **nothing will be printed**



Flow Chart :



Special Fruit salad :

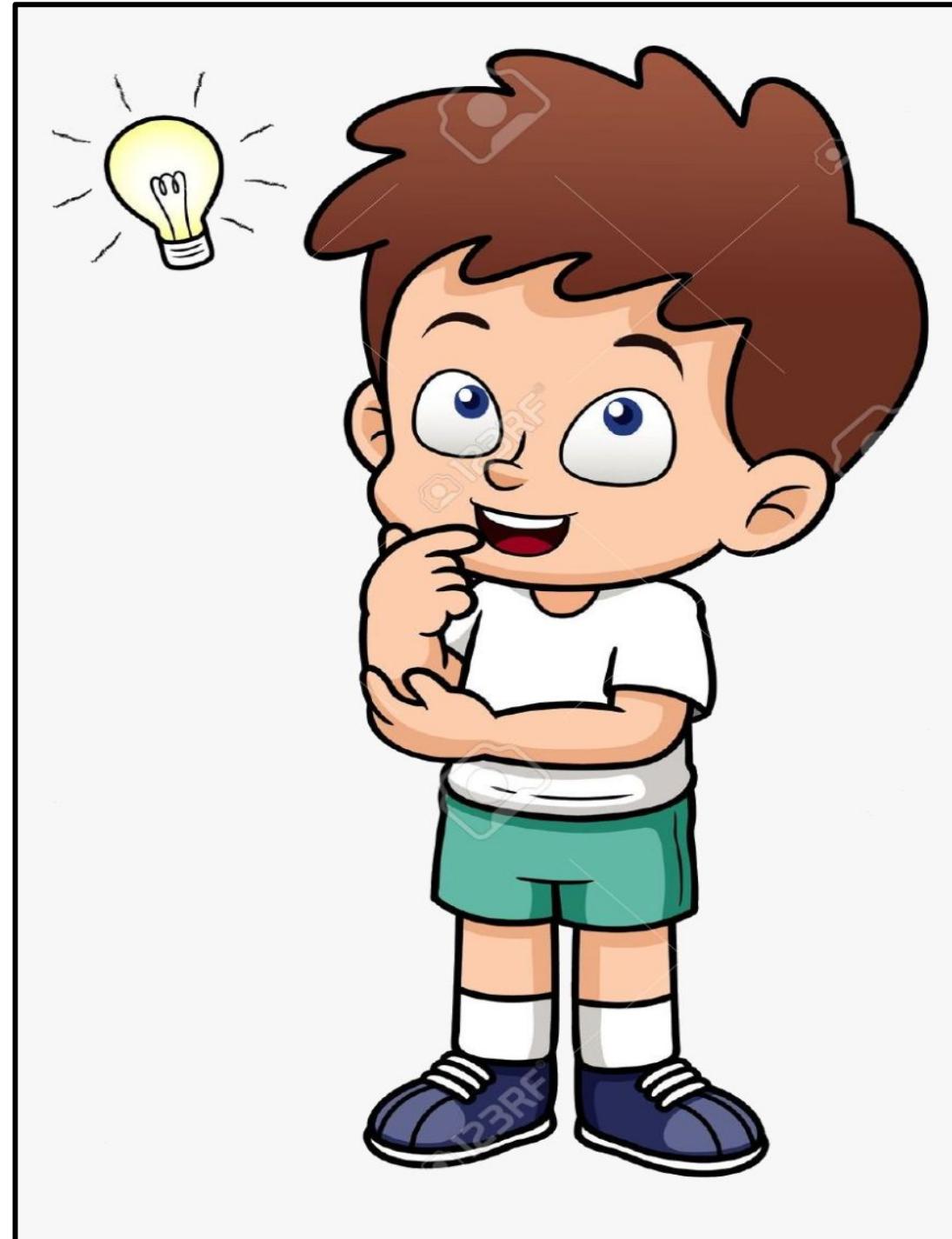
- Newton's mom had run short of apples and asked him to go to the market to buy 1 kg if the shopkeeper had them.
- This time, she also told him to check for pears and get 1 kg if they were available, hoping to make the fruit salad extra special for her guests.



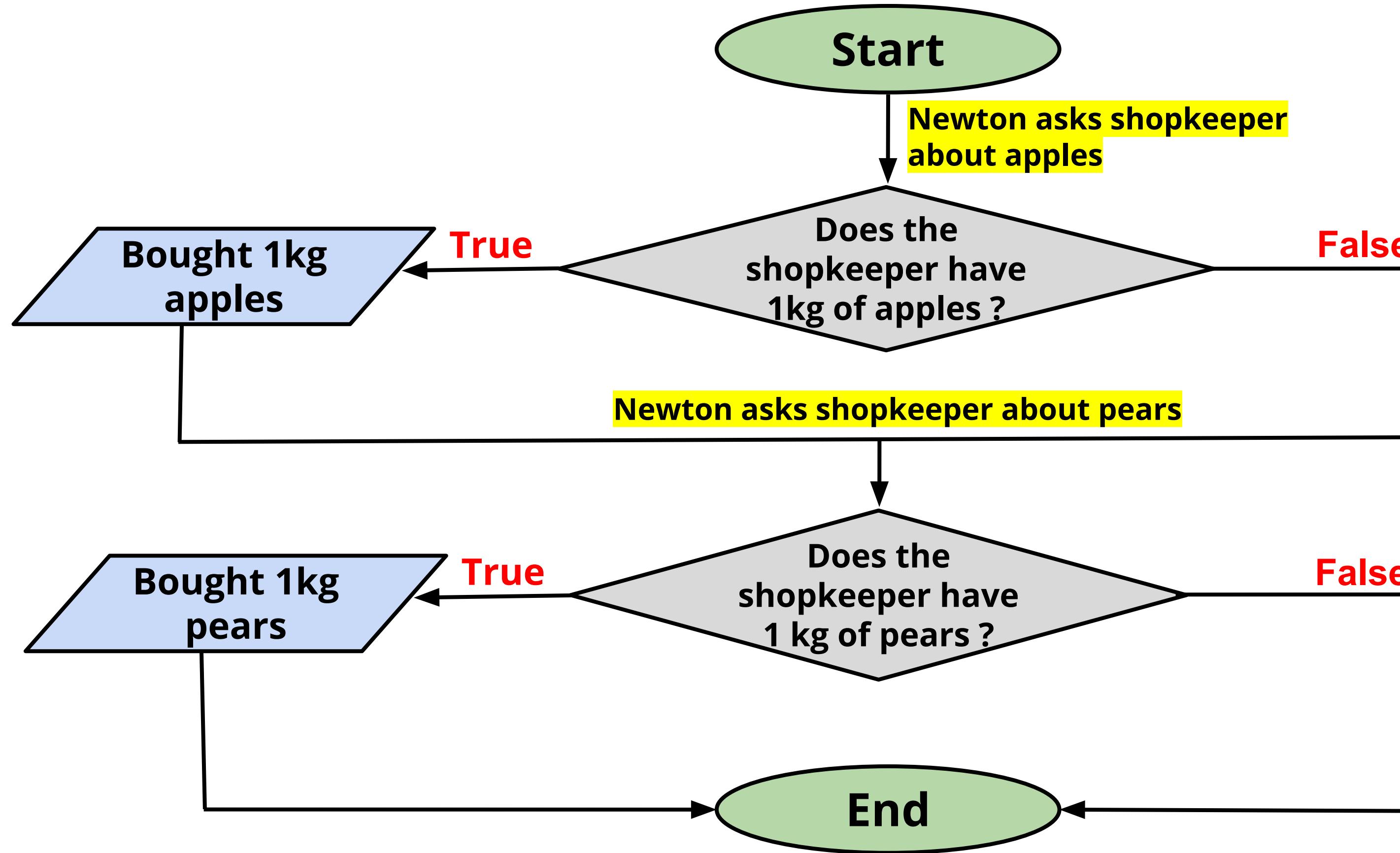
Newton is on the way !!!!



What steps does Newton follow to complete his mom's task ?



Flow Chart - Use of two simple if statements :



Question - 2 : Special Fruit salad

Newton's mom is preparing a special fruit salad. She gave Newton a simple task:

"Newton, go to the market and ask the shopkeeper:

Do you have apples?

→ **If the answer is Yes, buy 1 kg of apples.**

Do you have pears?

→ **If the answer is Yes, buy 1 kg of pears.**

Example 1 : Yes

Yes

Output : Bought 1kg apples

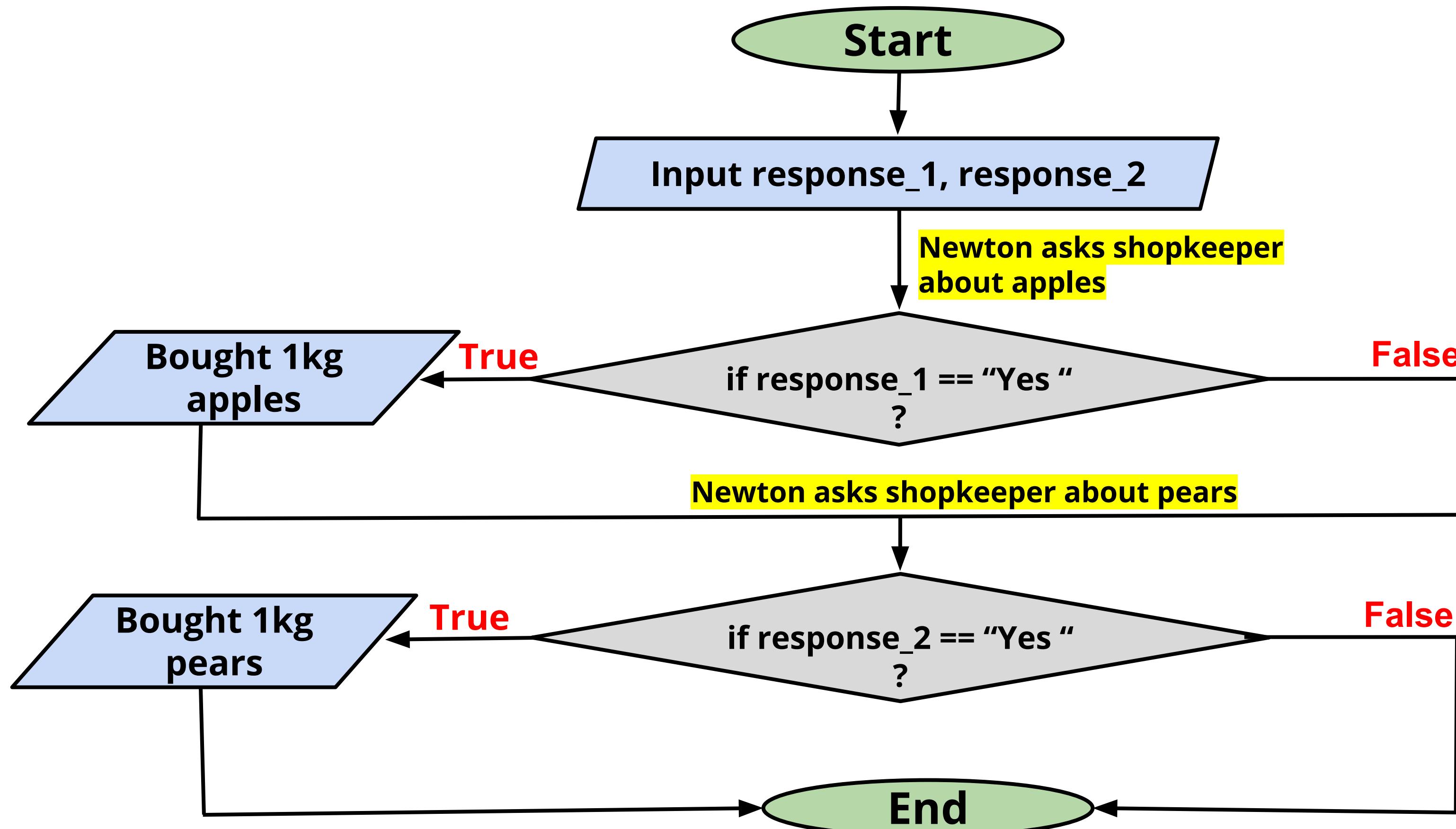
Bought 1kg pears

Example 2 : Yes

No

Output : Bought 1kg apples

Flow Chart - Use of two simple if statements :



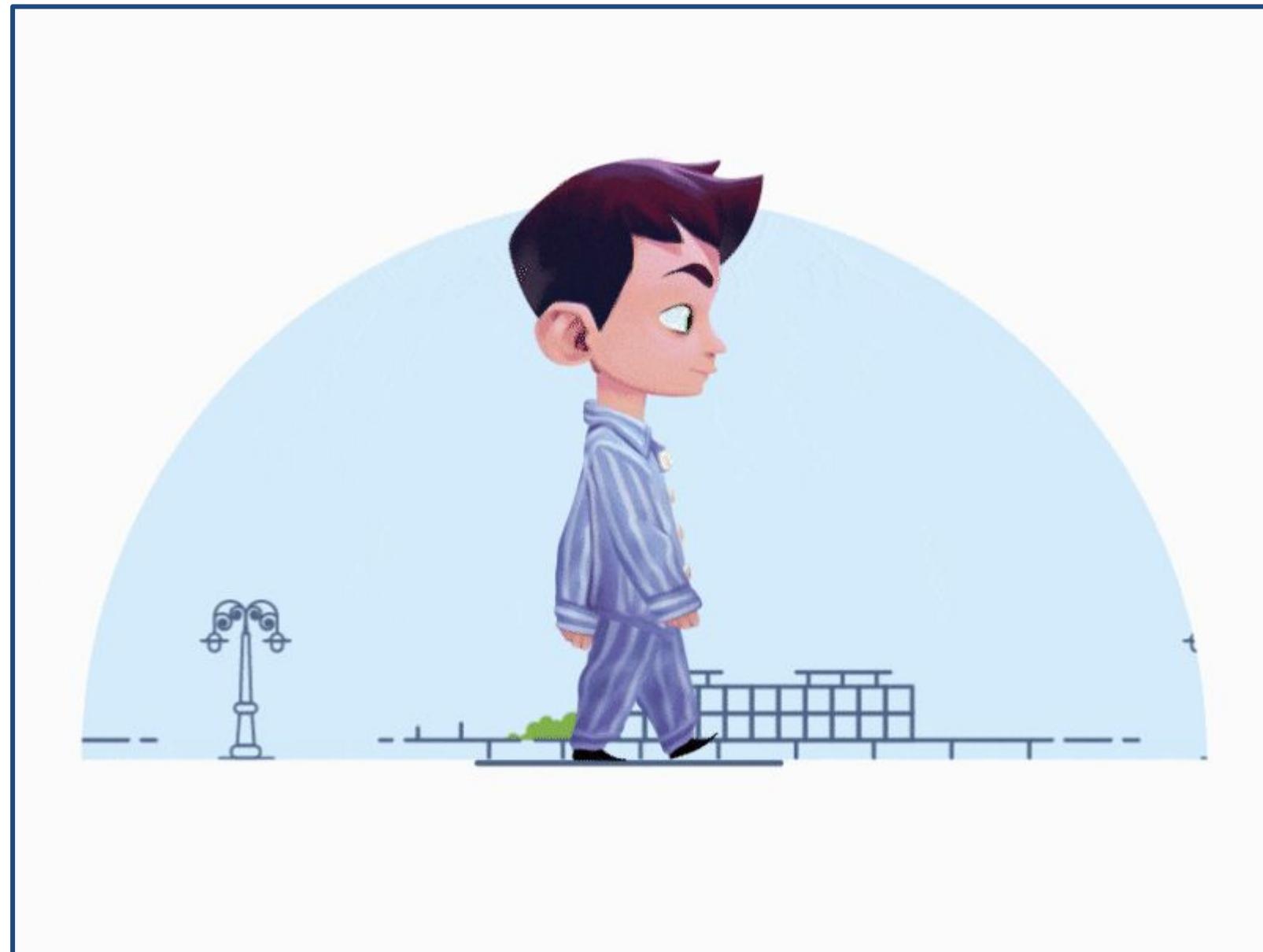
Newton's Fruit Dilemma :

This time, Newton's mom requested him again, "Newton, please go to the market and check if the shopkeeper has apple.

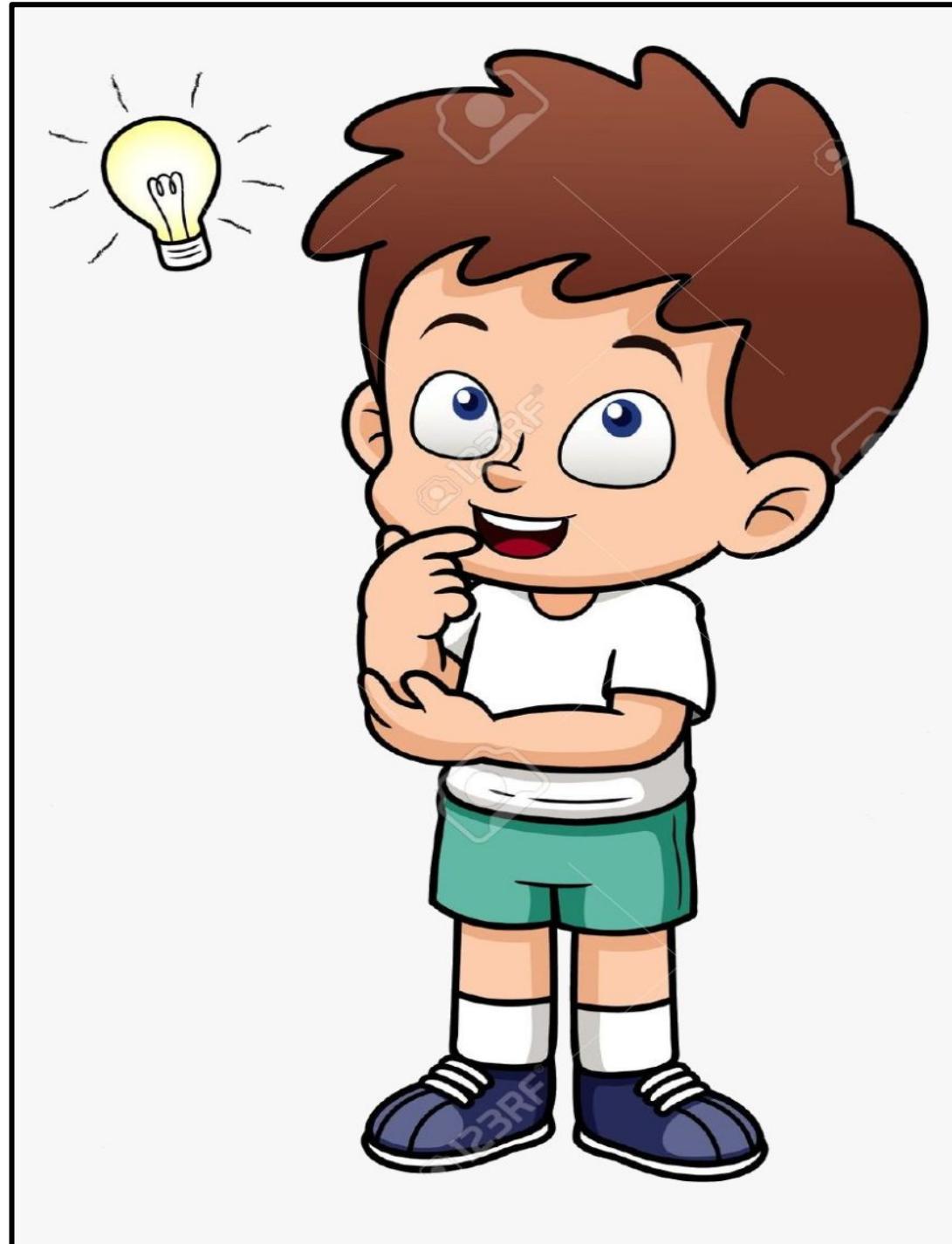
- If he has them, buy 1 kg of fresh apples for the salad.
- Otherwise, go to the other shop and buy ice cream for our guests. Either way, I want them to enjoy a delicious dessert tonight!"



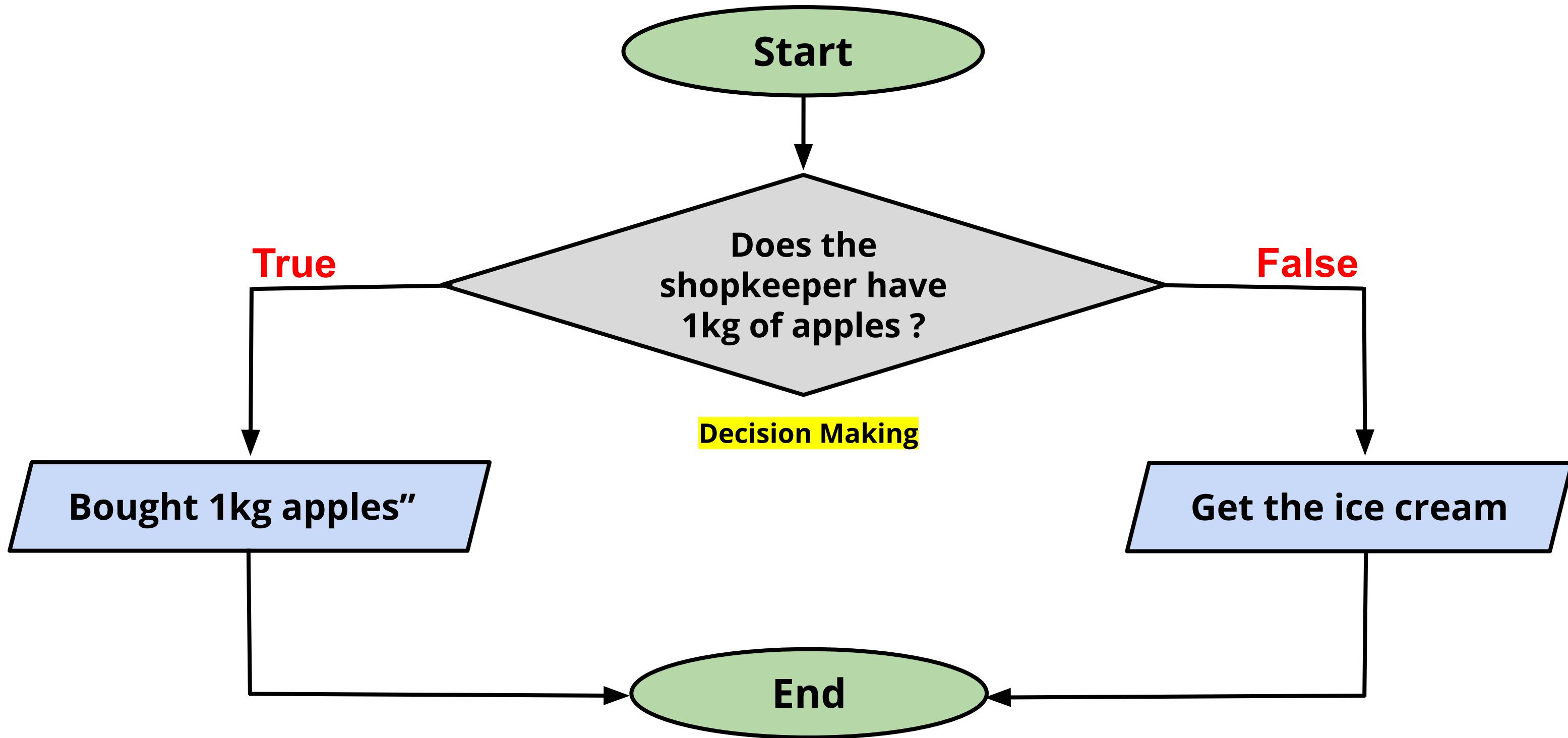
Newton is on the way, but this time he feels tired :



What steps does Newton follow to complete his mom's task ?



Flow Chart :



Question - 3 : Newton's Fruit Dilemma

Newton's mom is preparing a special fruit salad. She gives Newton a simple instruction:

- **"If the shopkeeper has apples, buy 1 kg of apples.**
- **Else, buy ice cream from another shop."**

Your task is to help Newton decide what to buy based on the shopkeeper's response.

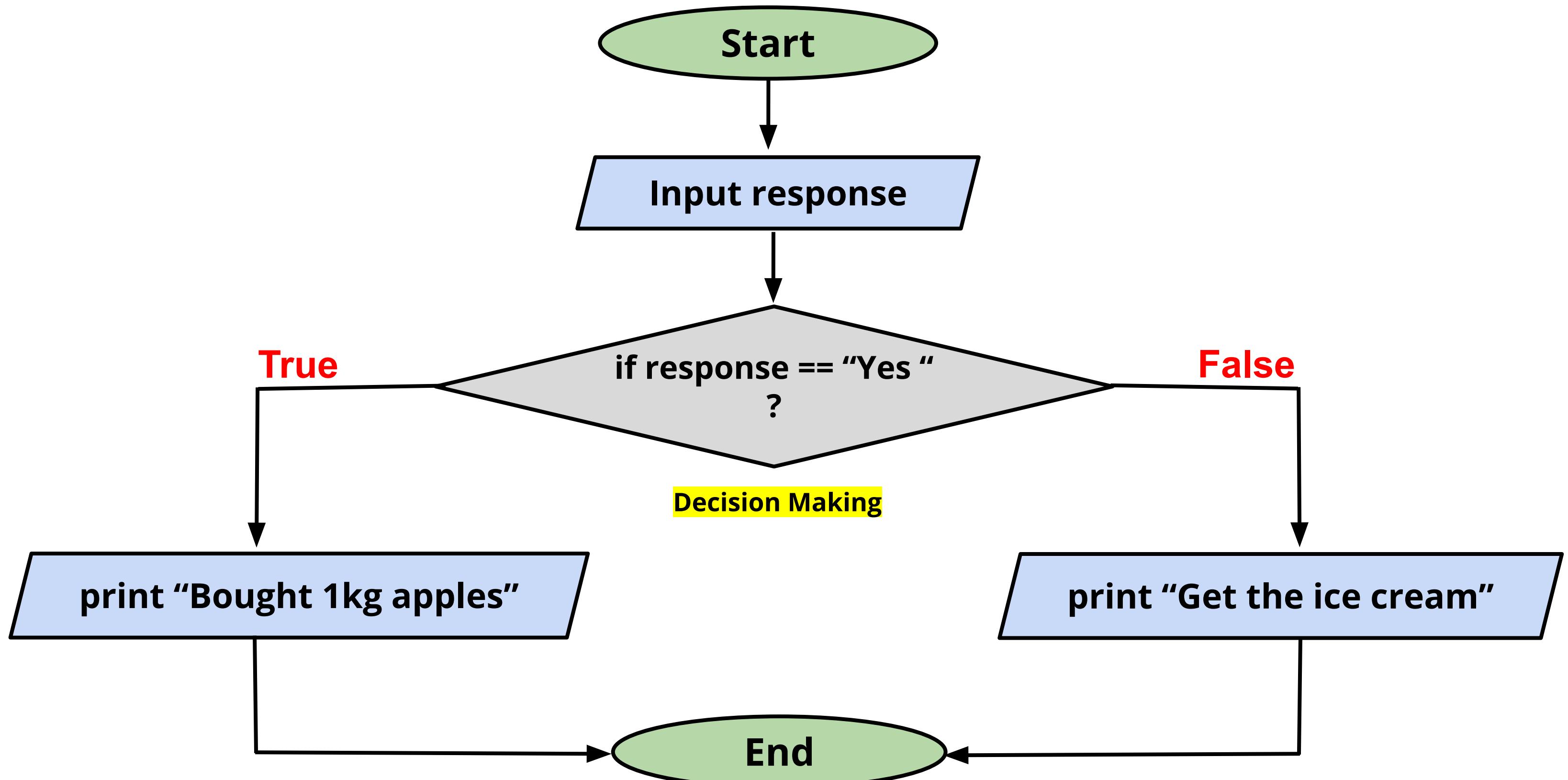
Example 1 : Yes

Output : Bought 1kg apples

Example 2 : No

Output : Get the ice cream

Flow Chart :



Question - 4 : Vision's Exam Plan

Vision is a hardworking student preparing for his exam. He uses two conditions to decide how to spend his evening:

- If tomorrow is the exam and he has not completed his study, then he will stay home and continue studying.
- Otherwise, he will go to a party tonight to relax.

Your task is to help Vision decide his evening plan based on these two conditions.

Example 1 : Yes

Yes

Output : Study at home

Example 2 : Yes

No

Output : Go to party

Logical operators:

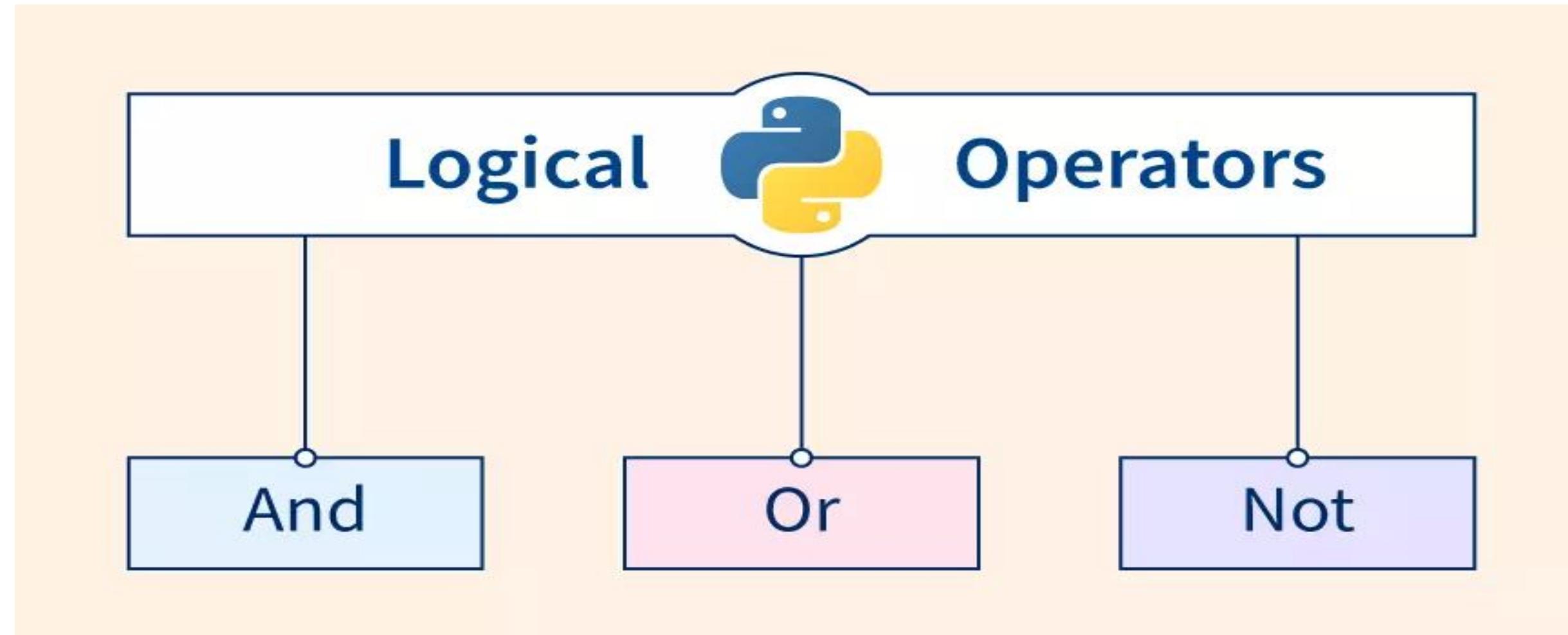
Logical operators :

Logical operators are used to combine multiple conditional statements.

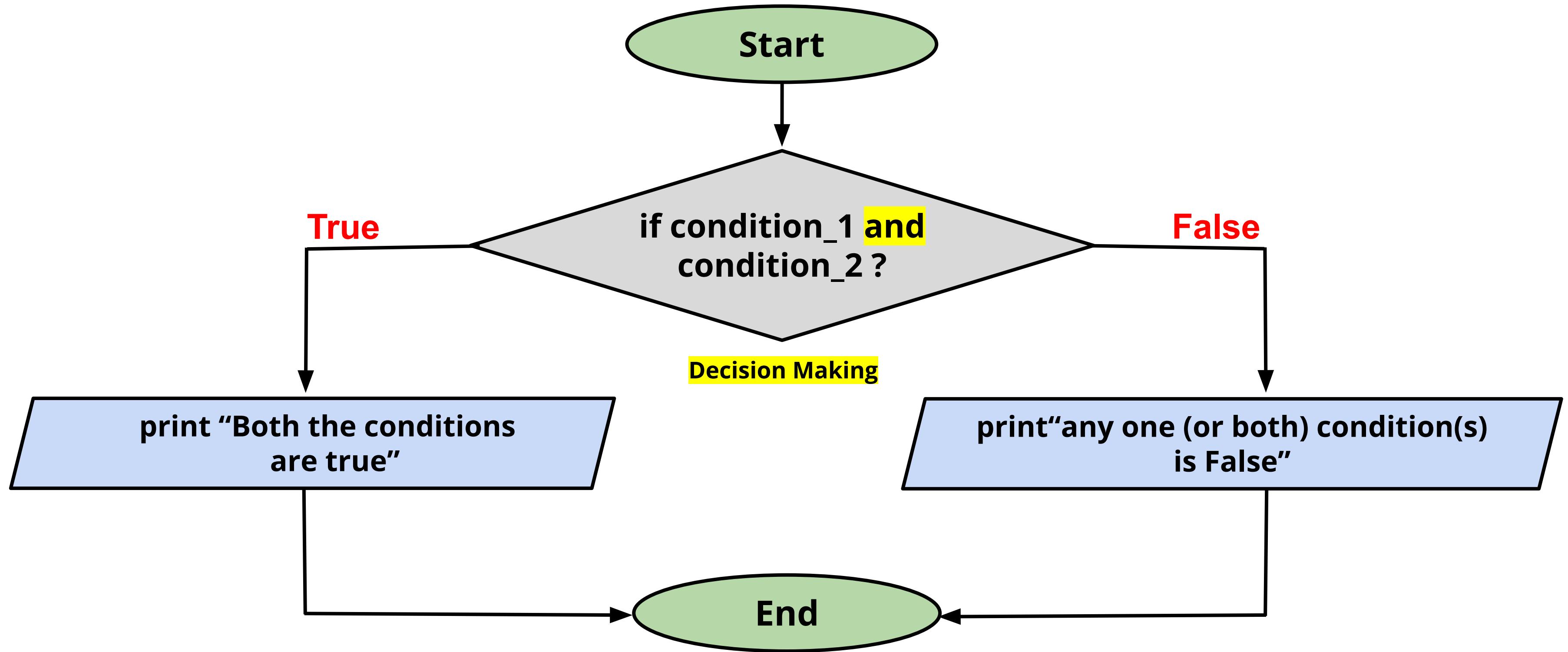


Logical operators :

Python has three main logical operators:



and operator – Flow graph :



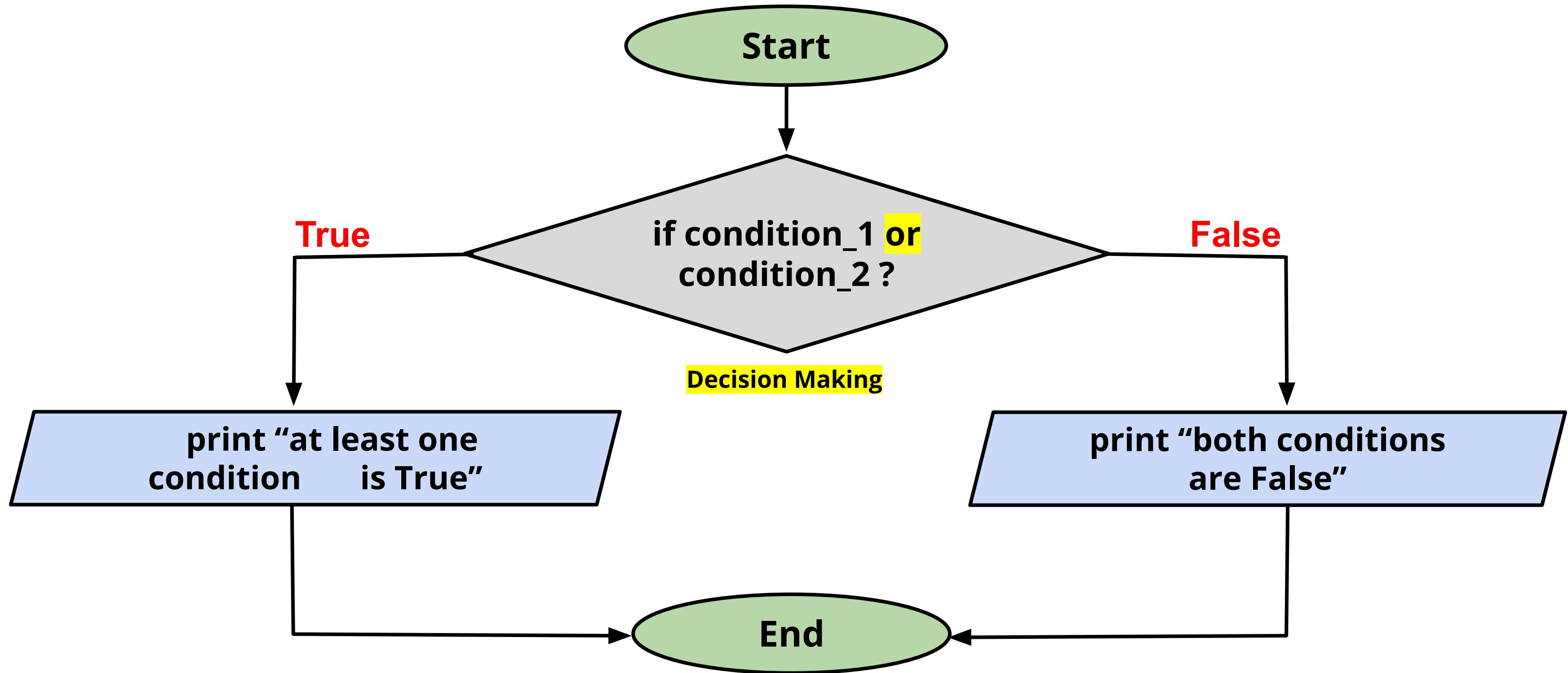
and operator – Syntax :

- Returns True as a final result only if both conditions are True, otherwise returns False.
- Use it when all the given conditions must be satisfied

Syntax

```
if condition1 and condition2:  
    # Code to execute if both conditions are True  
else:  
    # Code to execute if any one (or both) condition(s) is False
```

or operator - Flow graph :



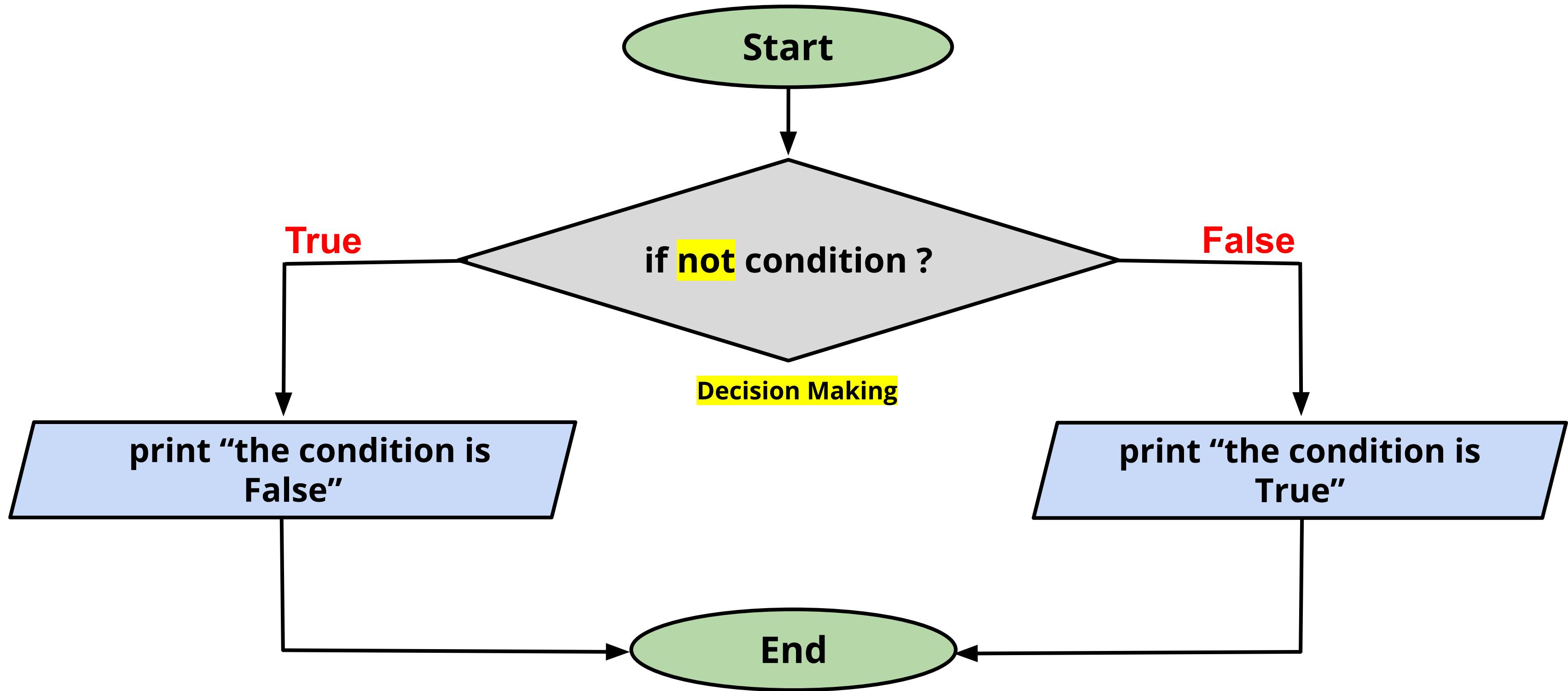
or operator – Syntax :

- Returns True as a final result if at least one of the conditions is True
- Use it when just one of the conditions needs to be true.

Syntax

```
if condition1 or condition2:  
    # Code to execute if at least one condition is True  
else:  
    # Code to execute if both conditions are False
```

not operator – Flow graph :



not operator – Syntax :

- Returns True as a final result if the given condition is False, otherwise False
- Use it when you want to reverse the result of a condition

Syntax

```
if not condition:  
    # Code to execute if the condition is False  
else:  
    # Code to execute if the condition is True
```

Logical operators :

| Operator | Description | Example |
|----------|---|---------|
| AND | Returns True if both operands are True | A and B |
| OR | Returns True if either of the operands are True | A or B |
| NOT | Returns True if the operand is False | not A |

Truth Table for AND , OR , NOT :

| a | b | a and b | a or b | not (a) | not (b) |
|---|---|---------|--------|---------|---------|
| T | T | T | T | F | F |
| T | F | F | T | F | T |
| F | T | F | T | T | F |
| F | F | F | F | T | T |

Question - 4 : Vision's Exam Plan

Vision is a hardworking student preparing for his exam. He uses two conditions to decide how to spend his evening:

- If tomorrow is the exam and he has not completed his study, then he will stay home and continue studying.
- Otherwise, he will go to a party tonight to relax.

Your task is to help Vision decide his evening plan based on these two conditions.

Example 1 : Yes

Output : Study at home

Example 2 : No

Output : Go to party

Question - 5 : Good friend

Alex woke up and started thinking about what to wear today.

He thought:

- if my best friend comes today or if I have an important meeting today, I'll dress up smartly in trousers and a shirt.
- Otherwise, I'll just wear my jeans and a t-shirt."

Your task is to help Alex decide what to wear.

Example 1 : Yes

Output : Wear Trousers and shirt

Example 2 : No

Output : Wear Jeans and t-shirt

Question - 6 : Cold days

Arjun and Priti are best friends who have planned to go for a walk today. However, they have a rule:

- If the weather is not cold, they will go for a walk.
- If the weather is cold, they will stay indoors.

You are given an integer representing the weather condition:

- 0 means not cold
- 1 means cold

Write a program to help Arjun and Priti decide what to do.

Example 1 : Yes

Output : Bought 1kg apples

Example 2 : No

Output : Get the ice cream

References :

Book_1 : Intro to Python by Paul Deitel

| S.No. | Topic Name | Page No. |
|-------|---|------------------|
| 1. | if statements and comparison operators | 61 - 65 |
| 2. | conditional statements, if statement | 75 - 82 |
| 3. | boolean operators | 106 - 109 |

A large, stylized orange leaf shape is positioned at the top left, with a thin red outline. Another smaller orange shape is at the bottom right, also with a red outline.

Quiz Time!

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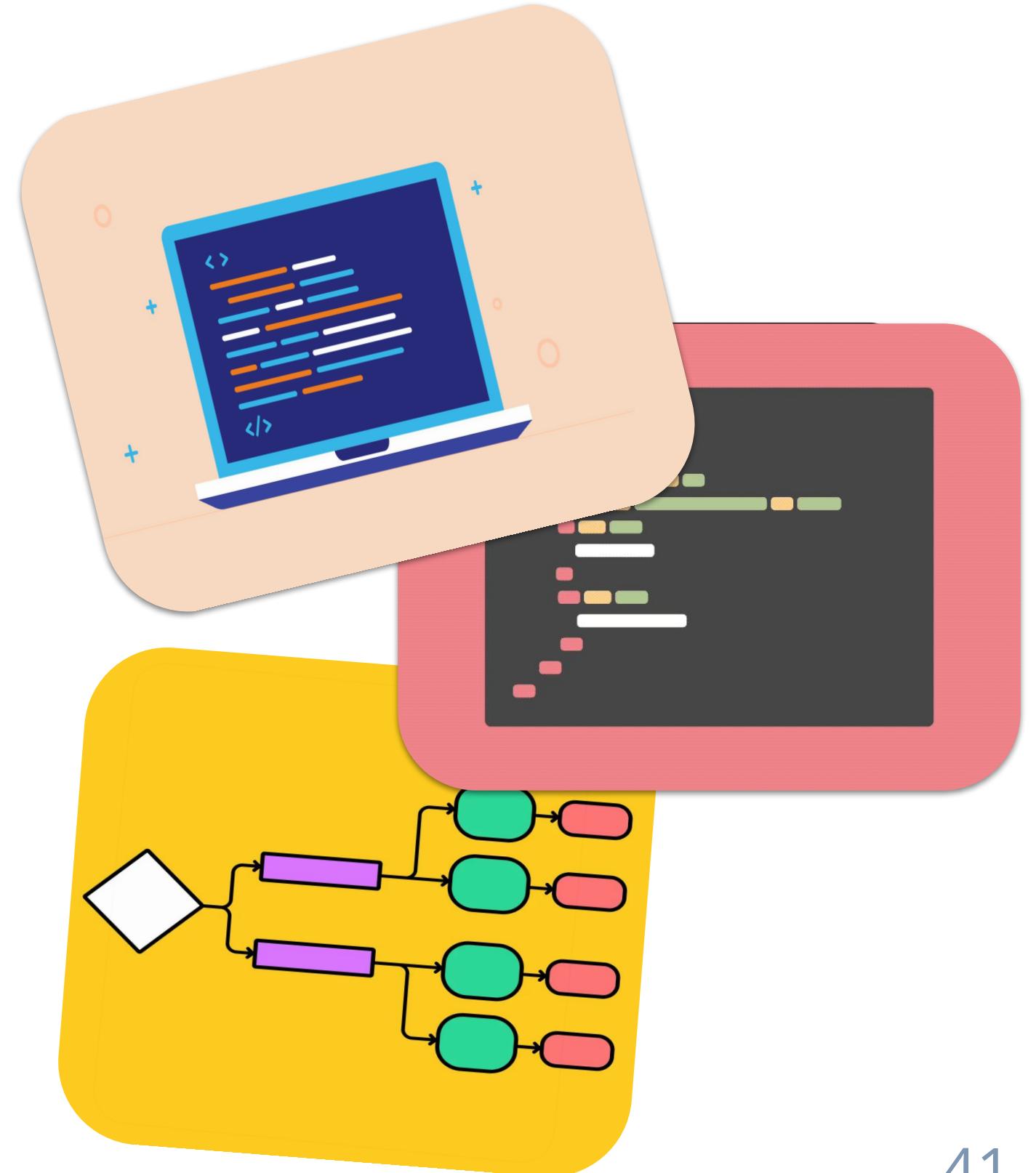
Please fill the feedback!

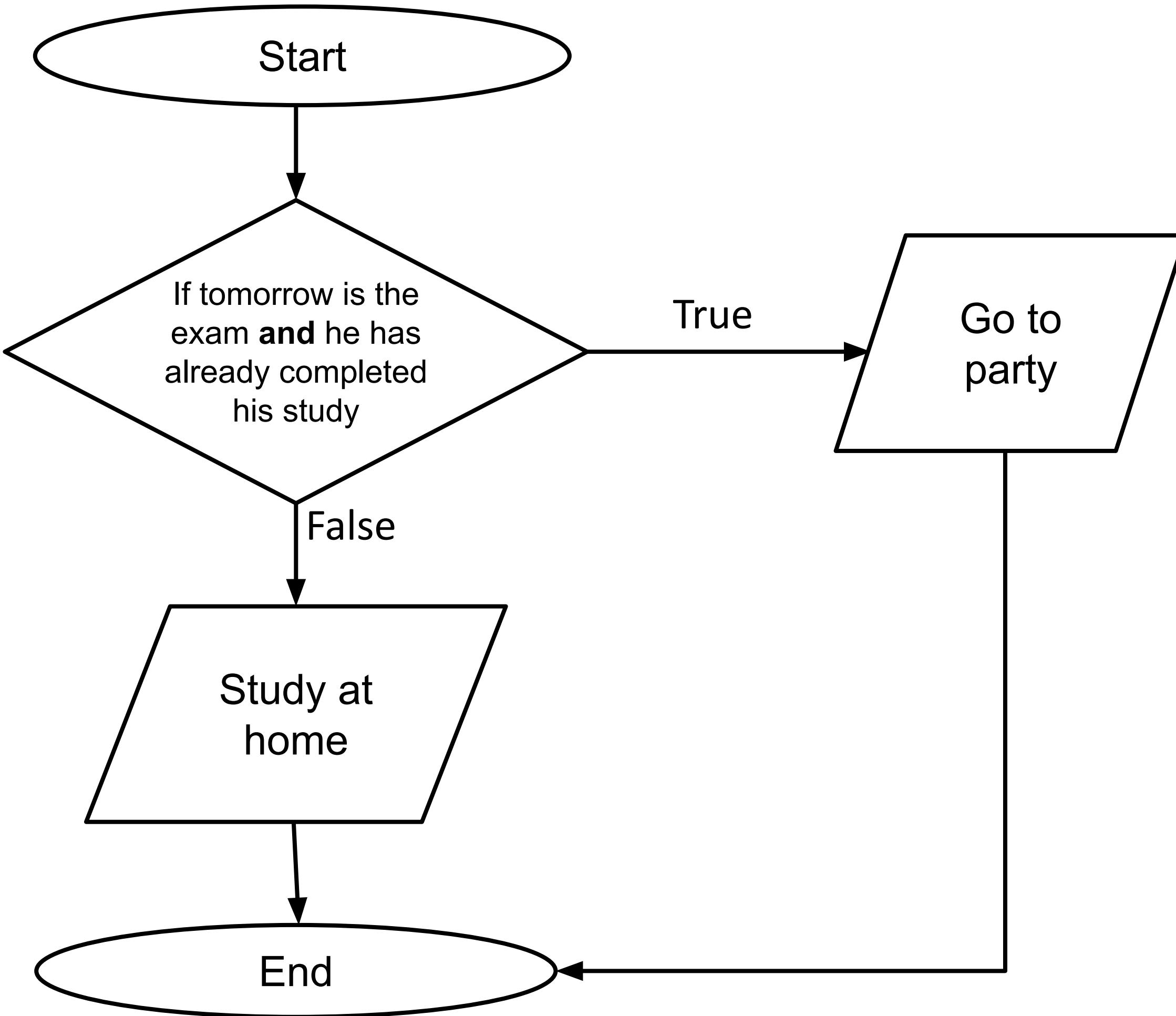
42

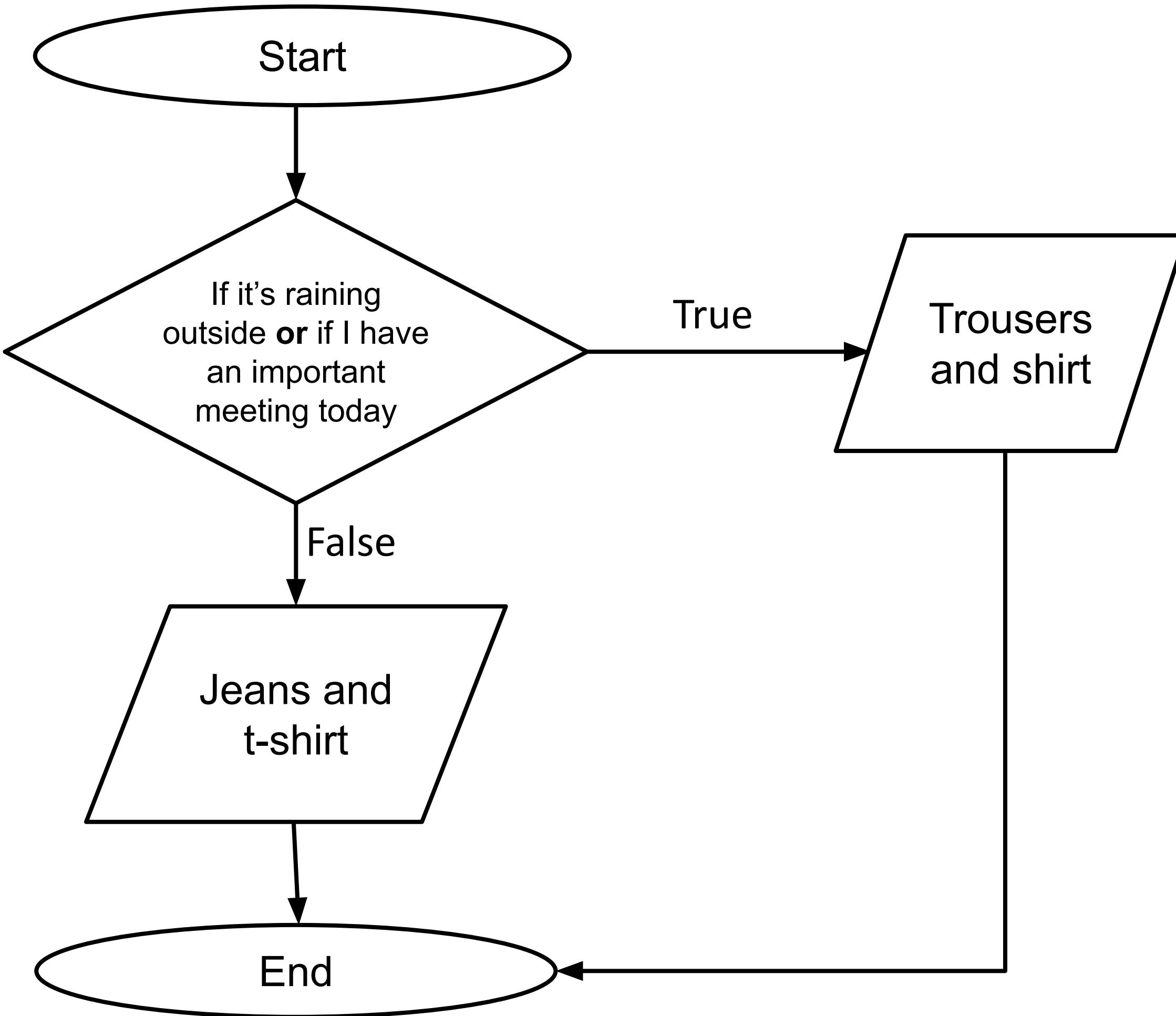
Thank You!

Summary

- **Control Flow structures:**
 - Conditional Statements
- **Conditional Statements**
 - if statement
 - if-else statements
- **Logical Operators**
 - and
 - or
 - not







not operator – Example :

```
color = "black"

if not (color == "white"):
    print("This shoe meets your criteria.")
else:
    print("This shoe does not meet your criteria.")
```

| INPUT | OUTPUT | ERROR |
|-------|-------------------------------|-------|
| 1 | This shoe meet your criteria. | |
| 2 | | |

or operator - Example :

```
color = "white"
price = 4000

if color == "white" or price < 3000:
    print("This shoe meet your criteria.")
else:
    print("This shoe does not meet your criteria.")
```

| INPUT | OUTPUT | ERROR |
|-------|-------------------------------|-------|
| 1 | This shoe meet your criteria. | |
| 2 | | |

Shoe Shopping Made Easy (not Operator) :

- You're shopping for shoes with a clear plan: the **shoes must not be white**.
- By focusing on this condition, you can quickly narrow down your choices.



and operator – Example :

```
color = "white"
price = 1000

if color == "white" and price < 3000:
    print("This shoe meet your criteria.")
else:
    print("This shoe does not meet your criteria.")
```

| INPUT | OUTPUT | ERROR |
|-------|-------------------------------|-------|
| 1 | This shoe meet your criteria. | |
| 2 | | |

[Code Snippet](#)

Shoe Shopping Made Easy (or Operator) :

- You're shopping for shoes with a clear plan: the shoes **must be white or cost less than 3000 rupees.**
- By focusing on these two things, you can quickly narrow down your choices.



Shoe Shopping Made Easy :

- You're shopping for shoes with a clear plan: the shoes **must be white and cost less than 3000 rupees.**
- By focusing on these two things, you can quickly narrow down your choices.

