visual programming

Branching

Bachelor of Information Systems
Institut Teknologi Del

Learning Objective(s)

This material should address the following question(s).

- What is branching?
- How to use branching?

Discussion Point

Branching:
The Core Concepts.

Problem

- A book store is currently making a clearance sale.
- The discount is segmented as:
  - **50%** if the transaction ≥ **$200**.
  - **20%** if the transaction ≥ **$100**.
- Both of the above schemas requires **at least 2 books** in the transaction.

There are 3 discount schemas:

1. **20%** when it reaches **$100**.
2. **50%** when it reaches **$200**.
3. **0%** when it is less than **$100**.

Both of the schemas require the involvement of at least 2 books in the transaction.

Branching is used to form all the alternatives.

Question

What is **branching**?

Definition

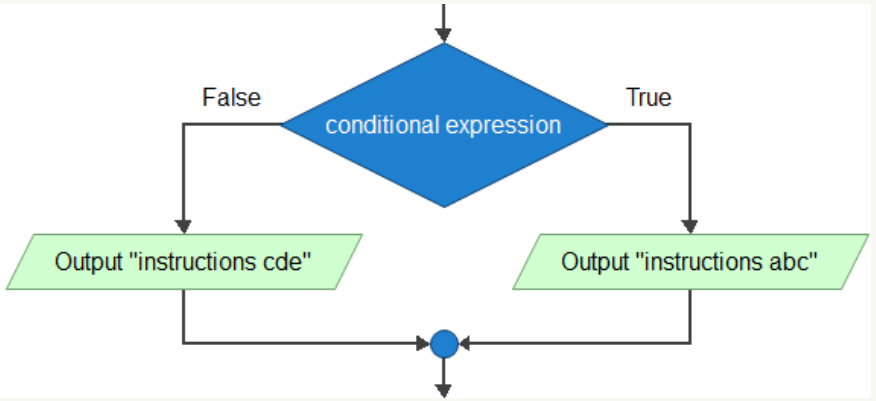
Branching is a way to create alternative execution paths. This elevates the solution to a higher level of flexibility.

It is possible to create nested alternatives.

Branching: Basic Form

- The basic form of branching is the `if-else` statement.
  - The statement creates exactly two alternatives.
  - Flowgorithm only support this form of branching.

```
if (conditional expression) {
  // instruction abc
} else {
  // instruction cde
}
```



Branching: The Conditional Expression

- The conditional expression should produce a **logical** value.
  - Relational, logical, and the combination of the two operations.

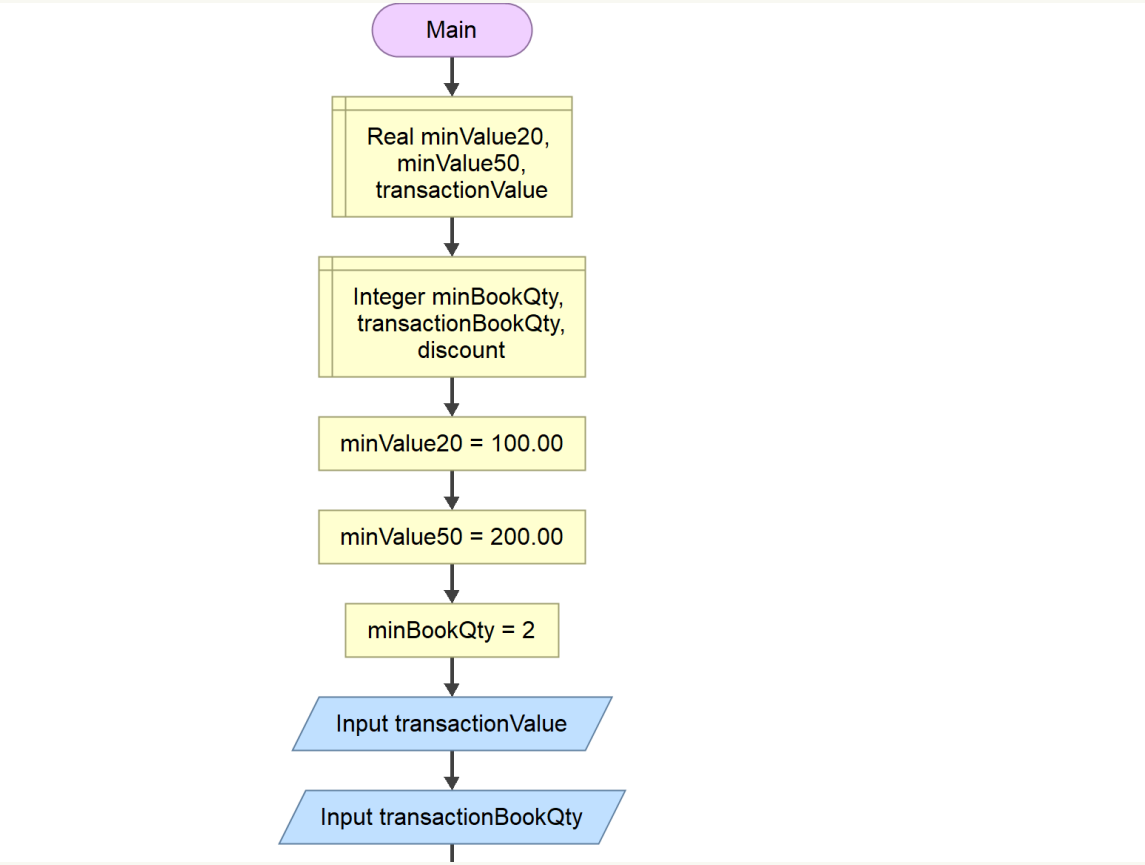
- The evaluation of the expression decides where the program execution goes.
  - Design it carefully.

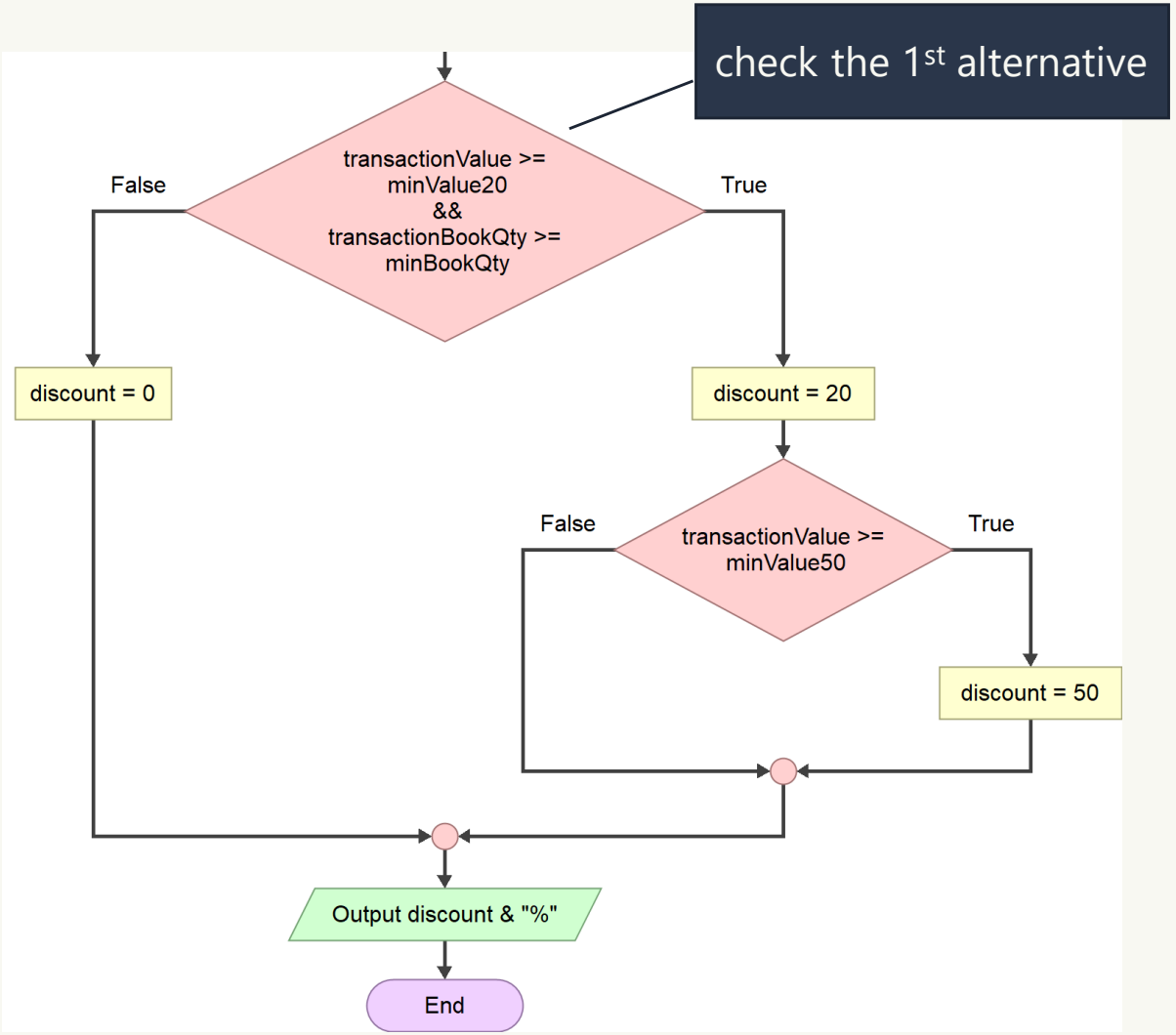
There are 3 discount schemas:

1. **0%** when it is less than **$100**.
2. **20%** when it reaches **$100**.
3. **50%** when it reaches **$200**.

Both of the schemas require the involvement of at least 2 books in the transaction.

Branching is used to form all the alternatives.


Main
Real minValue20, minValue50, transactionValue
Integer minBookQty, transactionBookQty, discount
minValue20 = 100.00
minValue50 = 200.00
minBookQty = 2
Input transactionValue
Input transactionBookQty


check the 1st alternative
transactionValue >= minValue20 && transactionBookQty >= minBookQty
False
True
discount = 0
discount = 20
transactionValue >= minValue50
False
True
discount = 50
Output discount & "%"
End

Branching: Advanced Forms

- Advanced languages have other forms of the basic `if-else`.
  - `if` form.
  - `if-elseif-else` form.
  - Ternary form.

- Other branching statement:
  - `switch-case` (will not be discussed here).

Final **Thoughts.**

Conclusion

1. Branching is used to create alternative execution flows.
2. A branching requires a valid **conditional expression** which its evaluation dictates the flow of the solution execution.
3. Flowgorithm only support the basic `if-else` form.

References

Wassberg, J. (2020). Computer Programming for Absolute Beginners. Packt.

If Shape – Flowgorithm
http://www.flowgorithm.org/documentation/if.html

– E O F –

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