Computational Thinking Part 3

Review : Case Study

Decomposition

Abstraction

Pattern Recognition

Algorithms

Review : Case Study

Review : Case Study

Abstraction

Simplification by eliminating the unnecessary details that won't be needed in the solution provided.

Which system analysis inputs can we eliminate from the final solution?

Abstraction on Analysis

1. In a factory we have a conveyor belt, a part of the internal system.
2. The purpose is to calculate how much the shipping will cost for each box.
3. Each box has a different size and weight.
4. Every box has an address, contact info, attached on it.
5. Every box has a stiffness (How much it can resist to external force).
6. Our conveyor belt has 2 steps:
   * RGB sensor, detects the color of the box to understand the size of it. (R = 255, G=255, B=255)
   * There is a load cell that measures the weight of it.
7. The conveyor belt gets the shape first, later the weight.
8. Calculation must be made : ((H + L + W) * Weight) + 1$
9. Save the calculated result to the DB.

Abstraction applied on Analysis

1. In a factory we have a conveyor belt, a part of the internal system.
2. The purpose is to calculate how much the shipping will cost for each box.
3. Each box has a different size and weight.
4. Our conveyor belt has 2 steps.
5. The conveyor belt gets the shape first, later the weight.
6. Calculation must be made : ((H + L + W) * Weight) + 1$
7. Save the calculated result to the DB.

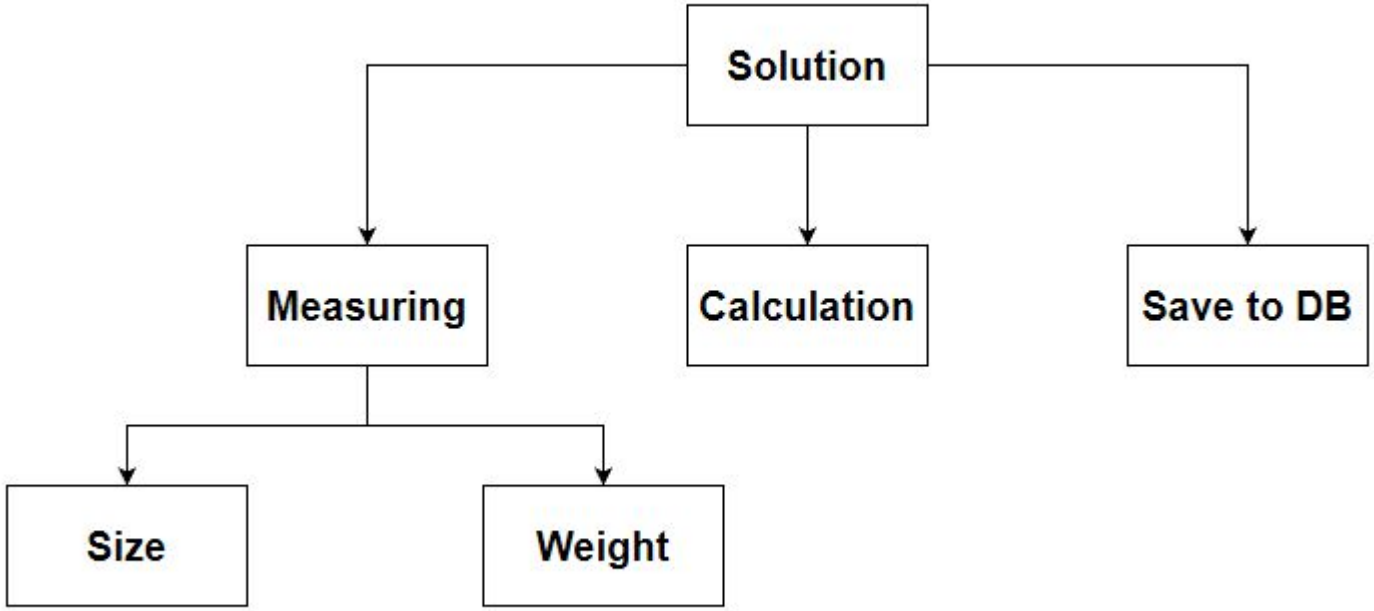
Abstraction

Input Shape => Process ((Height + Width + Length) * Weight) + 1$ => Save the result in DB.

Decomposition

1. In a factory we have a conveyor belt, a part of the internal system.
2. The purpose is to calculate how much the shipping will cost for each box.
3. Each box has a different size and weight.
4. Our conveyor belt has 2 steps.
5. The conveyor belt gets the shape first, later the weight.
6. Calculation must be made : ((H + L + W) * Weight) + 1$
7. Save the calculated result to the DB.

Decomposition



Pattern Recognition and Modelling

1. In a factory we have a conveyor belt, a part of the internal system.
2. The purpose is to calculate how much the shipping will cost for each box.
3. Each box has a different size and weight.
4. Our conveyor belt has 2 steps.
5. The conveyor belt gets the shape first, later the weight.
6. Calculation must be made : ((H + L + W) * Weight) + 1$
7. Save the calculated result to the DB.

Pattern Recognition and Modelling

We should have a common model with definition;
Package

Length	: decimal
Width	: decimal
Height	: decimal
Weight	: decimal

Algorithm: Pseudocode, Flowchart

In order to have a solid developed algorithm we can use Pseudocode or Flowchart or both of them.

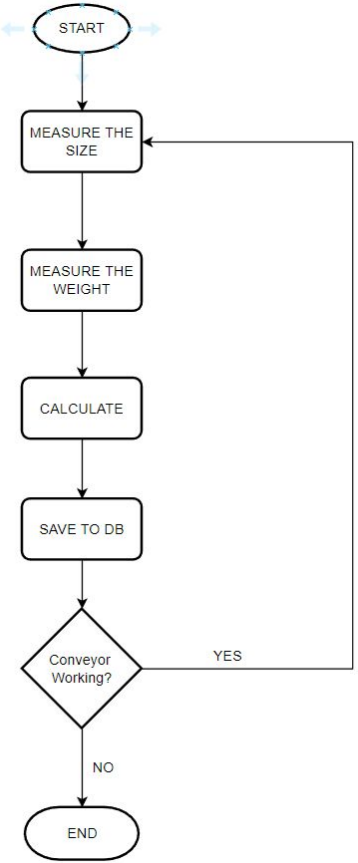
Pseudocode

In order to have a solid developed algorithm we can use Pseudocode or Flowchart or both of them.

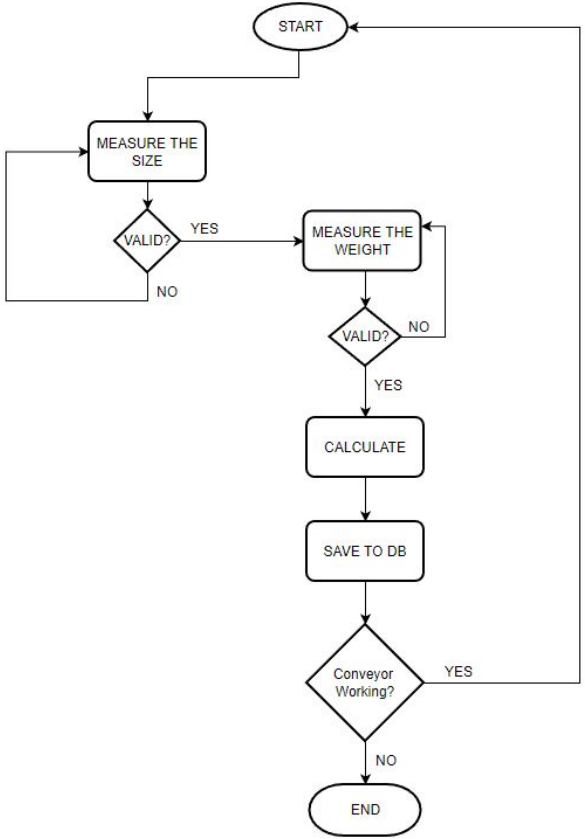
Pseudocode

- While the production line is active, conveyor belt sends new packets do the actions below;
- Measure the size by the help of RGB Sensor, send it to next sensor
- Measure the weight by the help of Load Cell.
- Do the calculation by using formula : ((H + L + W) * Weight) + 1$
- Save the results to the DB.

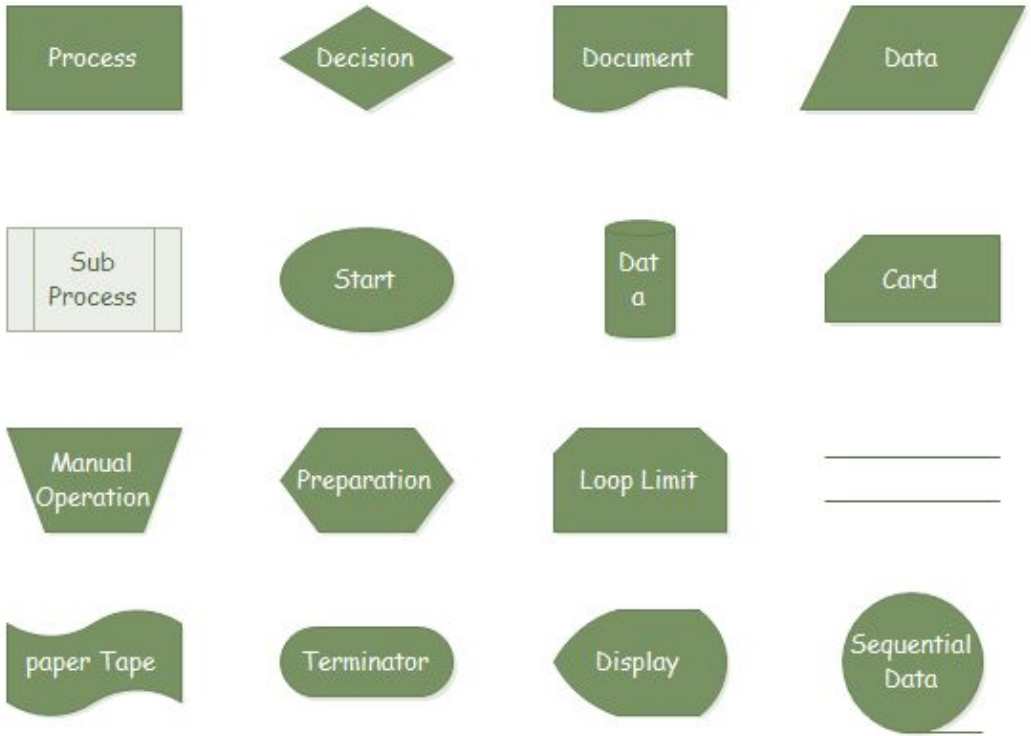
Flowchart


START
MEASURE THE SIZE
MEASURE THE WEIGHT
CALCULATE
SAVE TO DB
Conveyor Working?
YES
NO
END

Flowchart

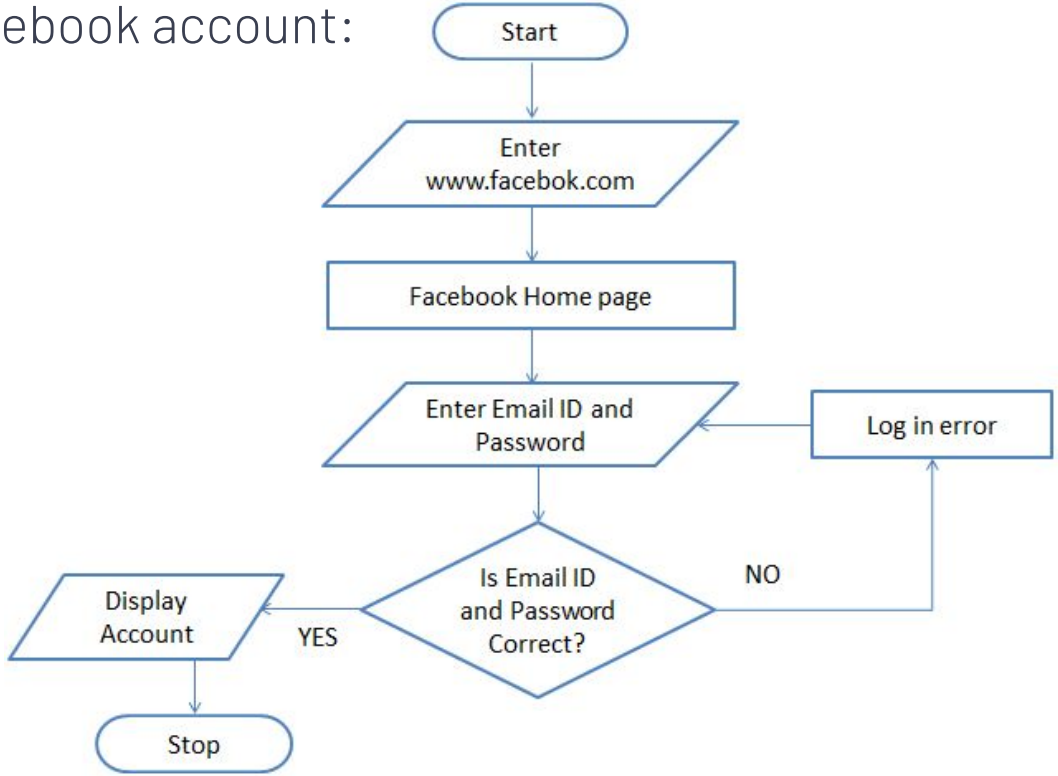

START
MEASURE THE SIZE
VALID?
YES
NO
MEASURE THE WEIGHT
VALID?
NO
YES
CALCULATE
SAVE TO DB
Conveyor Working?
YES
NO
END

Flowchart


Process
Decision
Document
Data
Sub Process
Start
Dat a
Card
Manual Operation
Preparation
Loop Limit
paper Tape
Terminator
Display
Sequential Data

Login Diagram

A flowchart to login to facebook account:




Kahoot!

The Algorithmic Statements
Brief overview of

if - else - elif
while - for - switch:case
exception handling
class, function, Inheritance
in Phyton syntax

Discussion :
Why interfaces don't exist?

THANKS!

Any questions?

You can find me at:

- @volkan
- volkan@clarusway.com