

The Concept of Control Structure In Programming



At the end of this lesson, students should know :

Structured Programming ;

- Linear Structure.
- Selection Structure :
 - Single selection
 - Double selection
 - Multi selection
 - Nested selection (*pilihan bersarang*)
- Looping Structure

Structured Programming

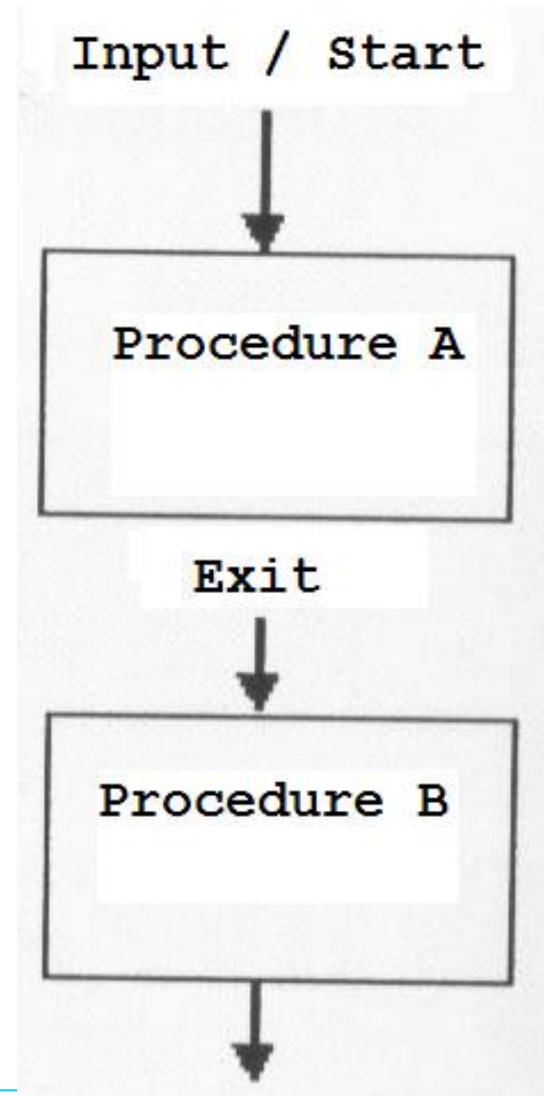
+ Why Structured Programming?

= Make a programming easy to understand

- Also known as Logic Structure in programming
- Structured programming is based on 3 basic controlling :
 - Linear Structure.
 - Selection Structure.
 - Looping Structure.
- This structure is top-down design
- Advantages - simple & easy to understand

Linear Structure.

Give the situation
That based on this
flowchart



Linear Structured

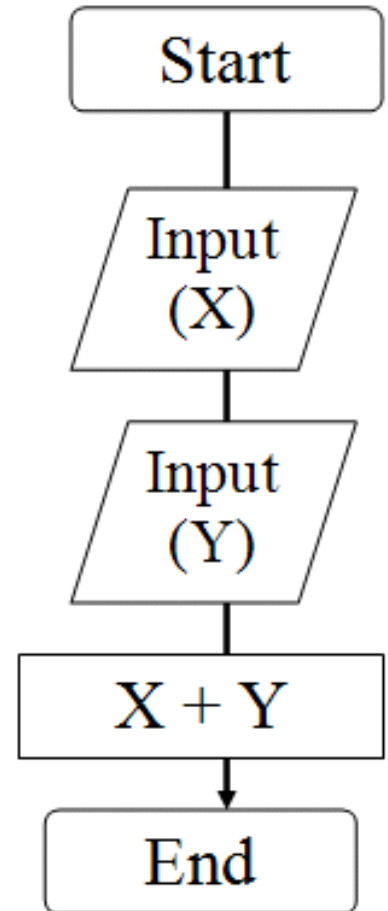
- “Linear” refer to routine programming that linear (step by step programming) (A – B – C – E --- Z)
- Routine = procedure : a set of instruction in logical unit

Routine example :

1. `int x, y; // type of X & Y value)`
2. `cin>>x; // input X value)`
3. `cin>>y; // input Y value)`
4. `cout<<x+y; // display total X + Y)`

Linear Structured

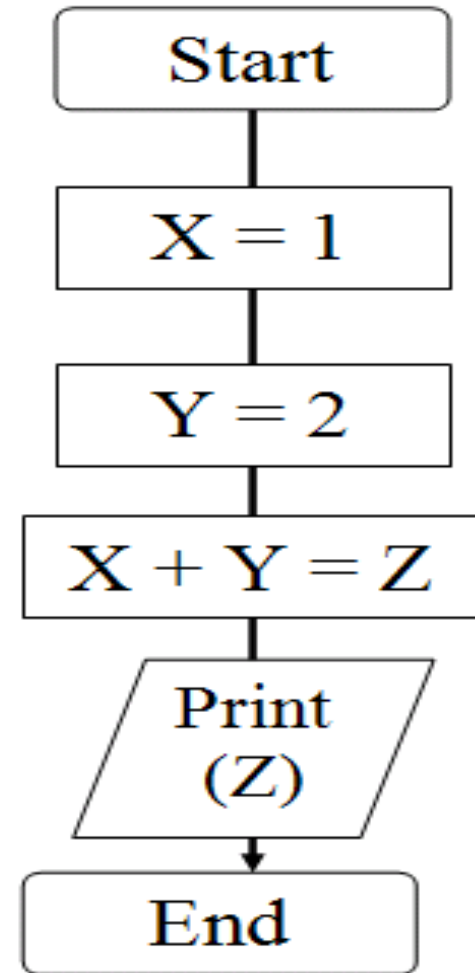
- Basically, linear structured used to solve simple problem.
- Eg : $X + Y = 2 + 4 = 6$



Linear Structured

Pseudo Code

1. Input X
2. Input Y
3. Calculate $X + Y = Z$
4. Output / Print Z
5. End

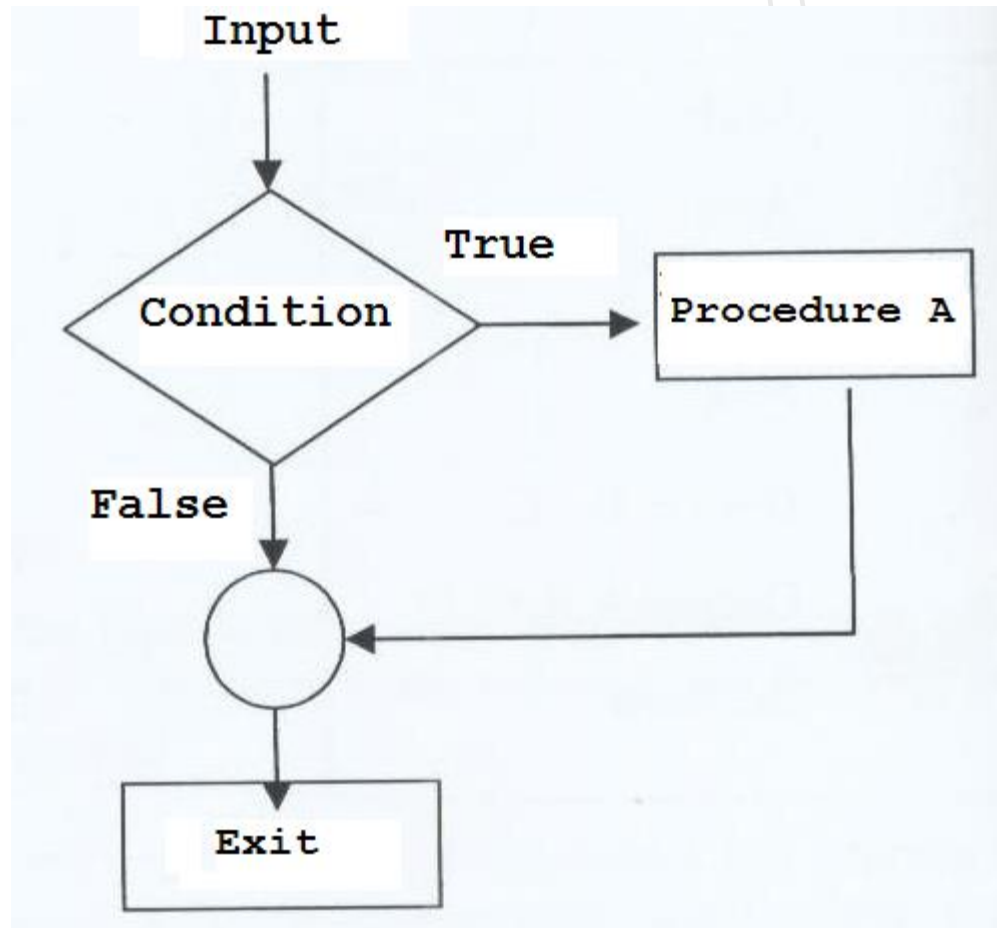


Linear Structured

- Other example :
- Student record application
- First routine : Input : name, course, matrix
- Second routine : display name, course, matrix, (sort by name)
- Just input, process and display

Selection Structure.

Give the situation
That based on this
flowchart

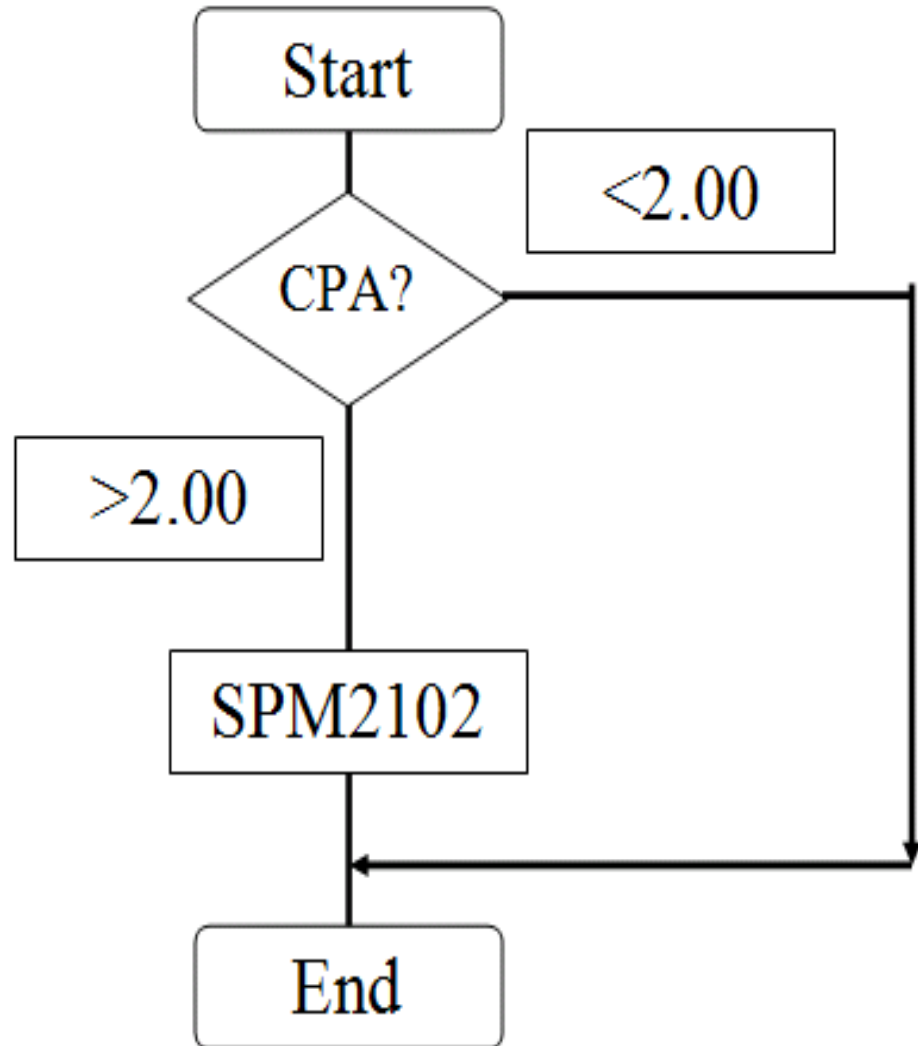


Selection Structured

- Next procedure or next decision depend on previous condition and input
- Next routine or procedure depend previous condition ; true (1) or false (0)

Selection Structured

- Situation :
All students can take SPM2102 for next semester except who gets < 2.00 in CGPA



Selection Structured

- There 4 design of selection structured :
 1. Single selection
 2. Double selection
 3. Multi selection
 4. Nested selection (*pilihan bersarang*)

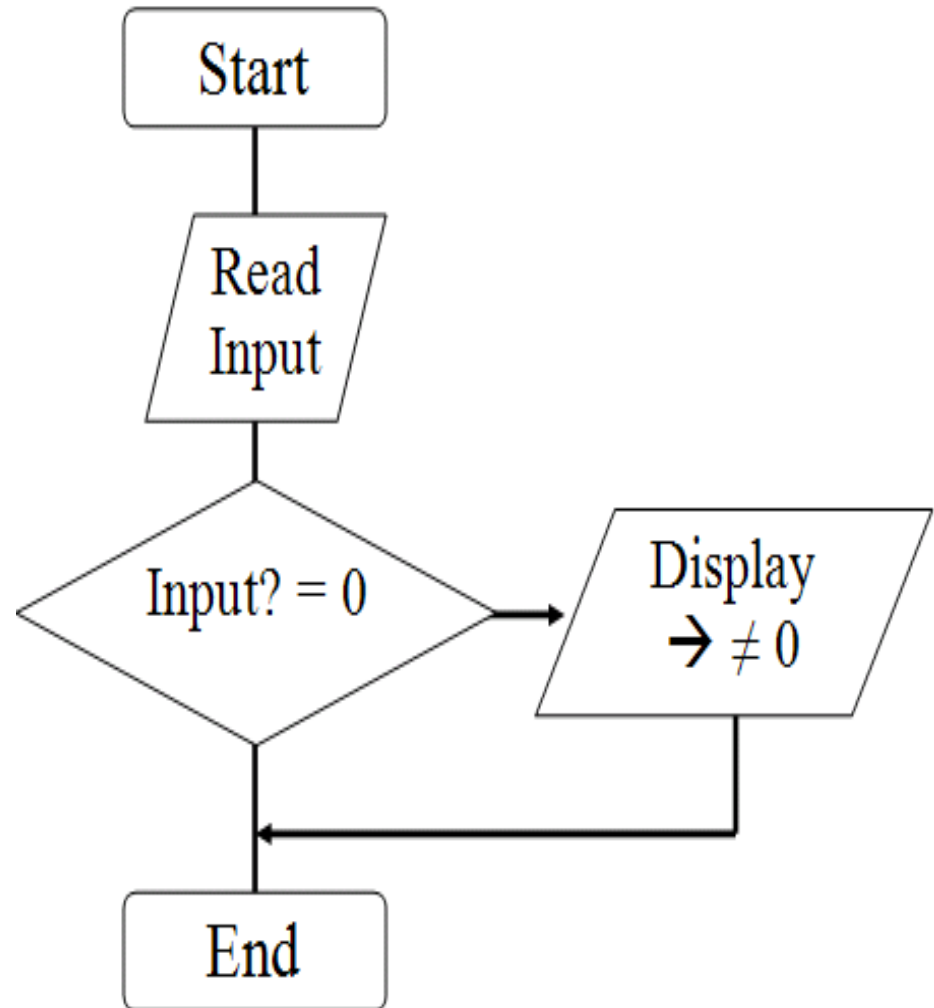
Single Selection Structured

If mark < 39 then Print fail, else go to end

Sketch up for the flowchart

Single selection

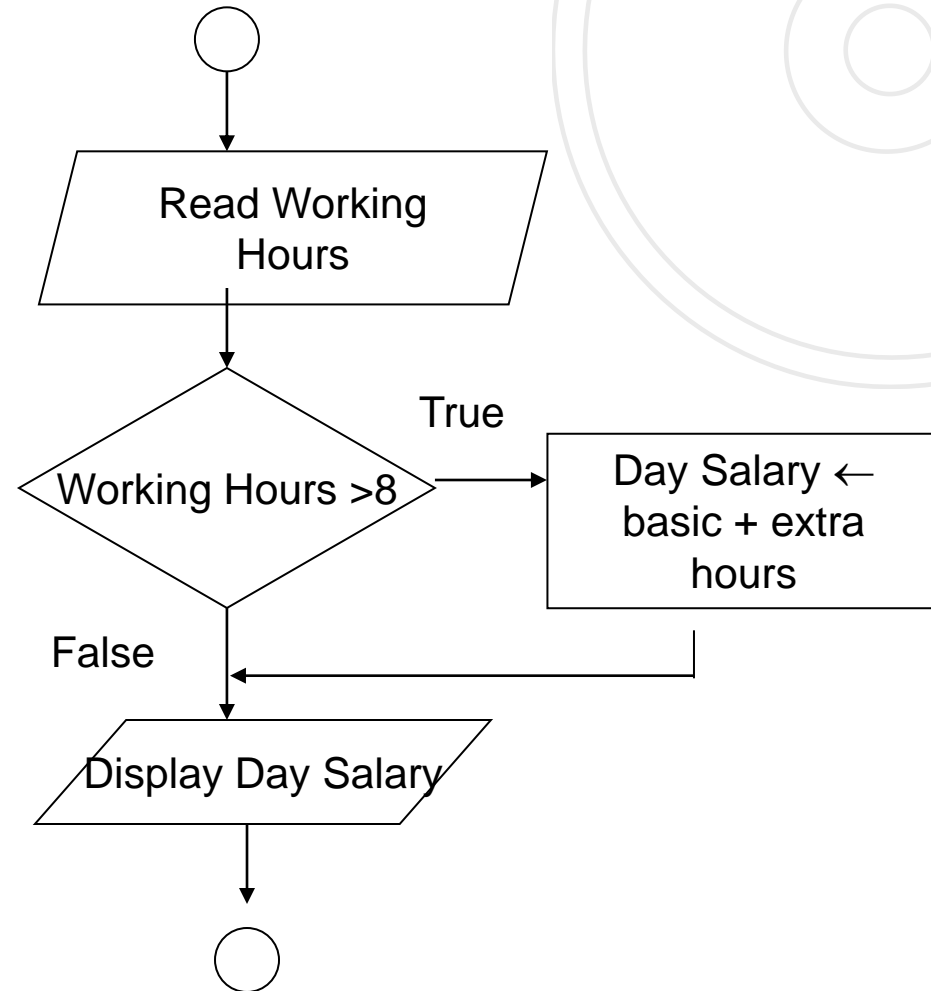
1. Start
2. Read the value
3. If value $\neq 0$
4. Then display the value
5. End



Structured Programming

Single selection

1. Start
2. Read the staf working hours
3. If working hours > 8
4. Then Day Salary = salary + extra hours
5. Display the DaySalary
6. End



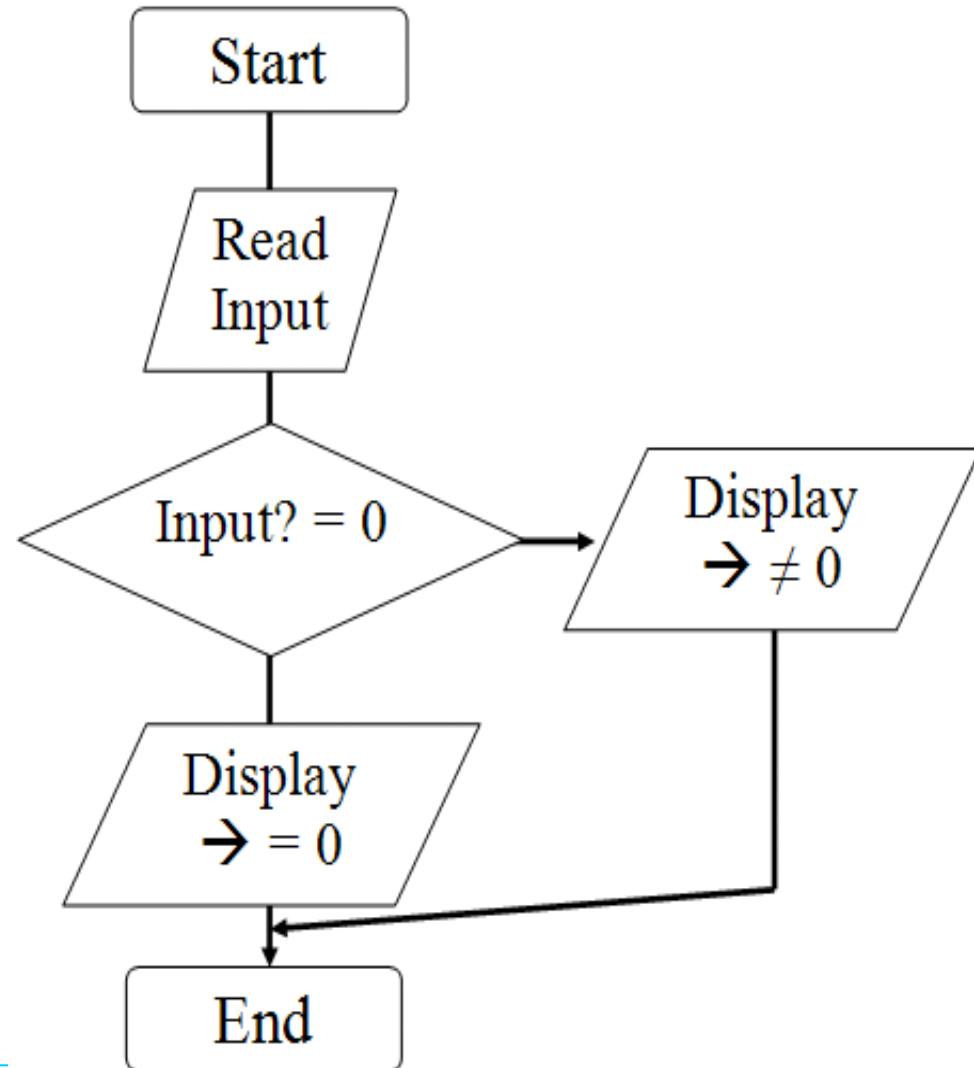
Dual Selection Structured

If mark < 39 then Print fail, then go to end
Else if > 39 then Print good,
End

Sketch up for the flowchart

Double / Dual selection

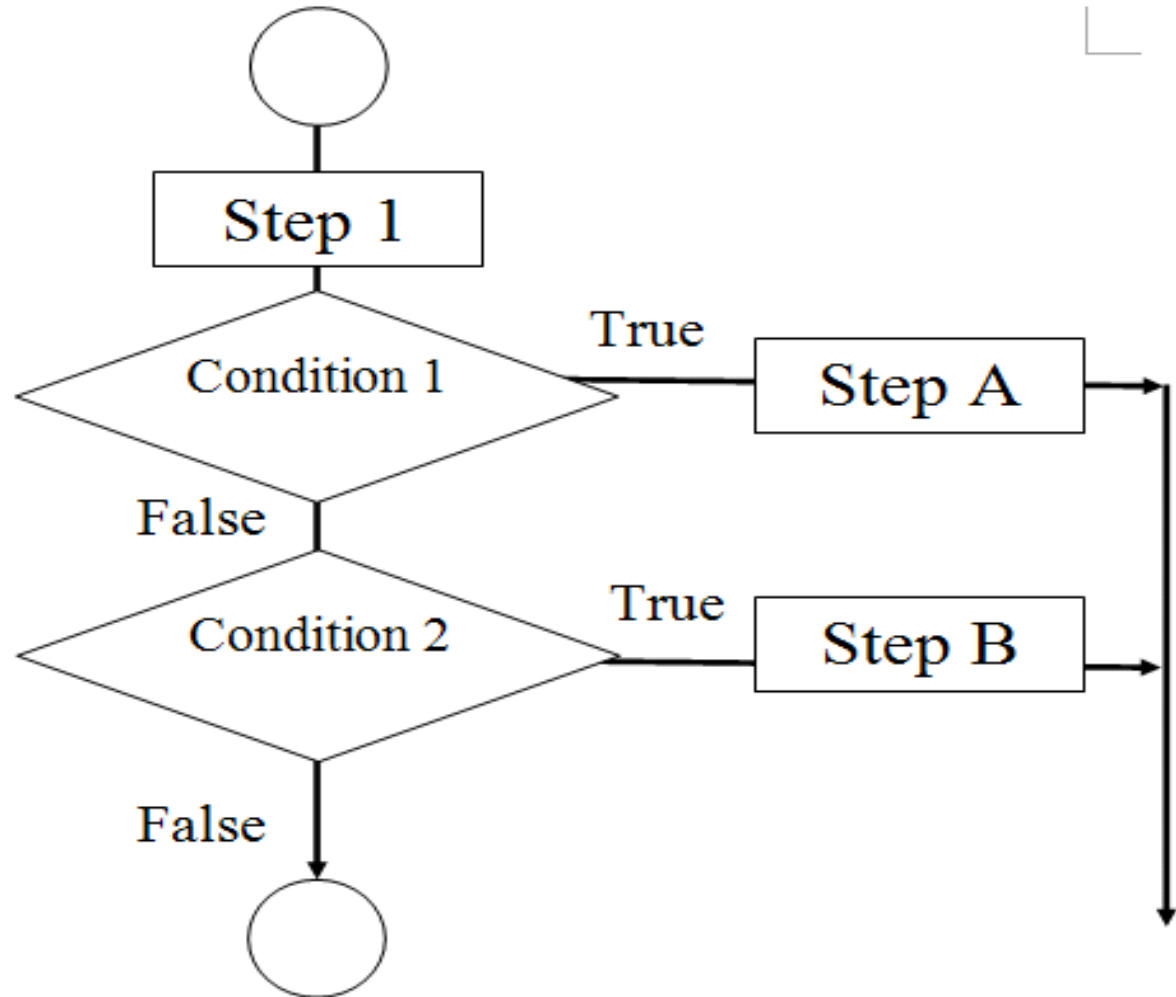
1. Start
2. Read the value
3. If value $\neq 0$, then display the value, go to End
4. Else $= 0$, then display 0
5. End



Multi Selection

- More than two condition or selection
- One input must be testing on more than two condition
- If first condition are true, then will be testing on second Condition. If else, other action / routine will be taken

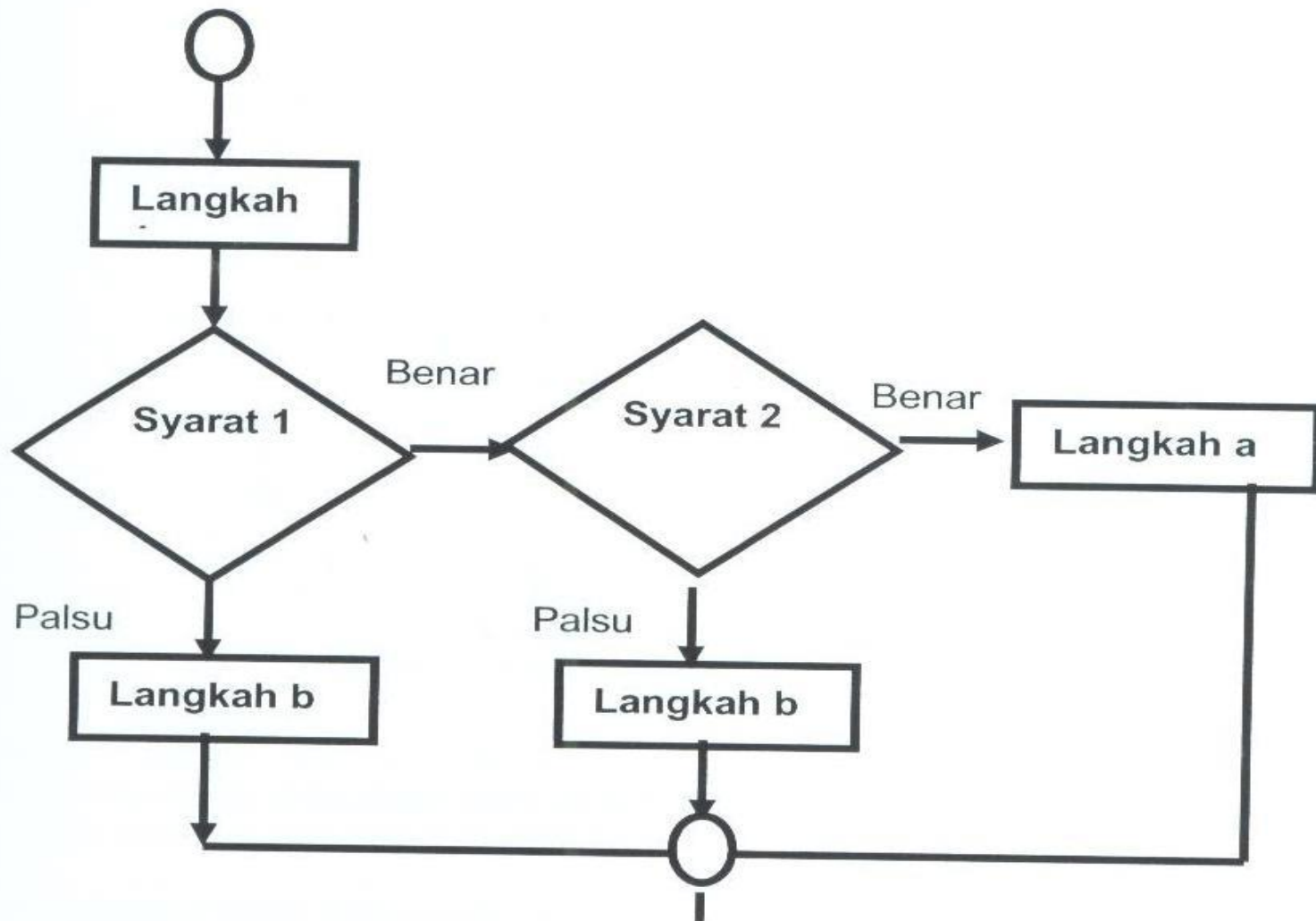
Multi Selection



Class activity

- Multi - Selection
- Draw a flow chart to make a choice of 1 of 3 chocolates namely Daim, Cadbury and Godiva. The final decision is whether or not to buy.
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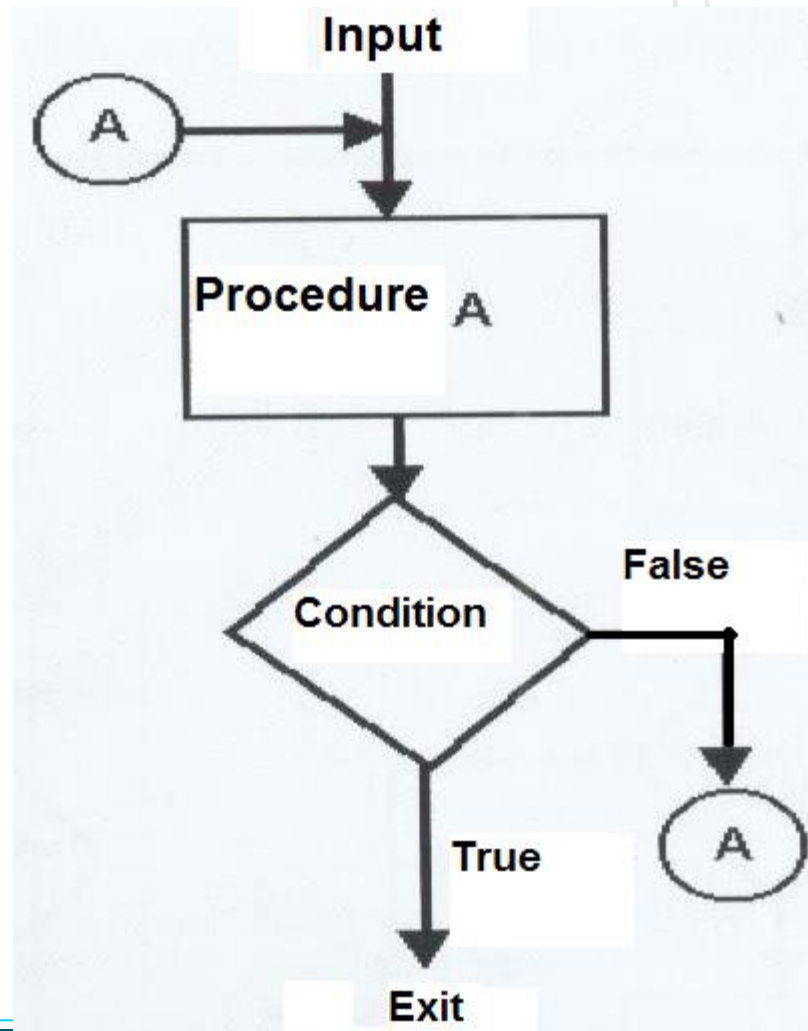
Nested Selection



Structured Programming

Looping Structure.

Give the situation
That based on this
flowchart



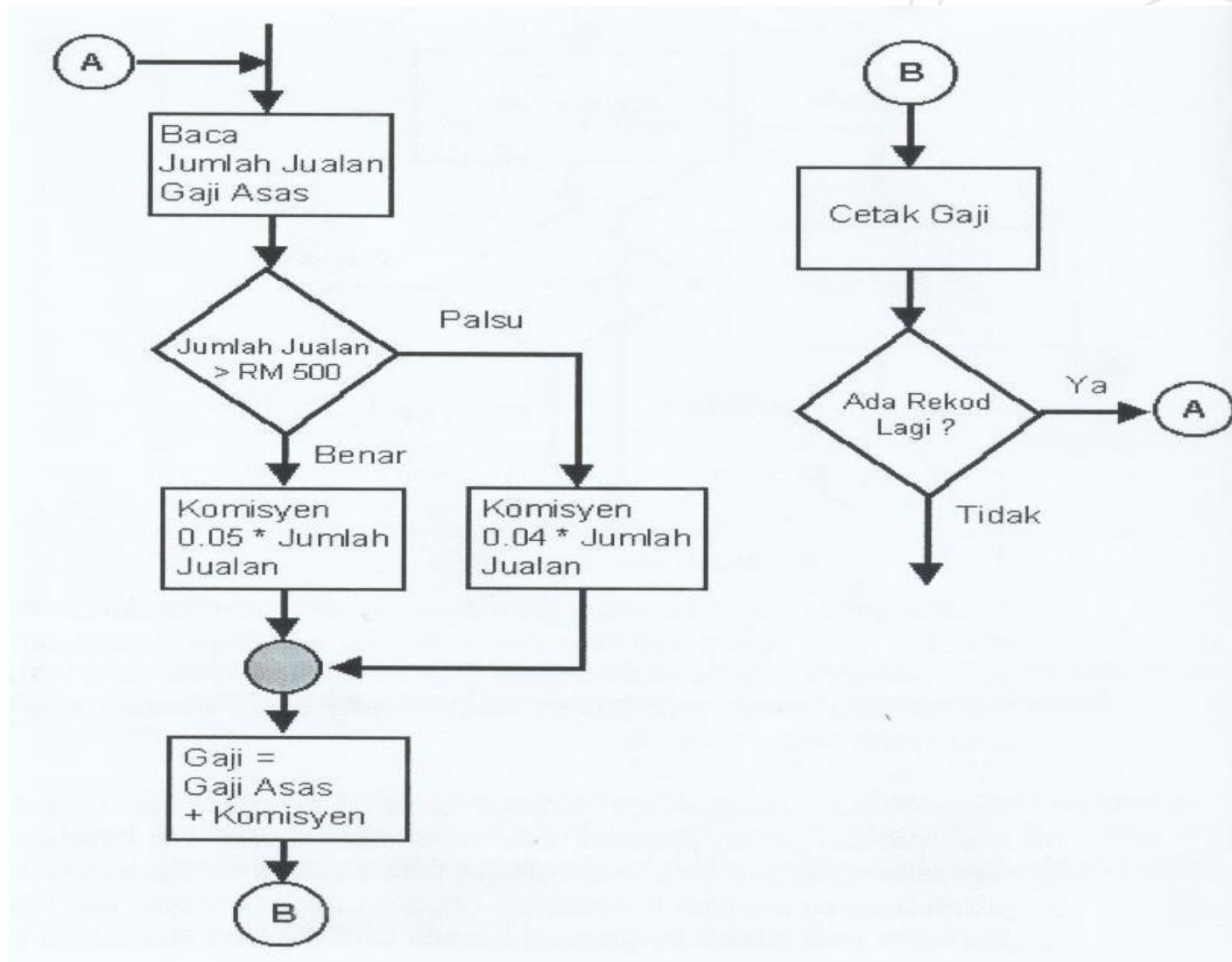
Looping Structured

If get mark < 50 , then repeat for the same subject, else register for next subject

→ Sketch up for the flowchart (*looping structured*)

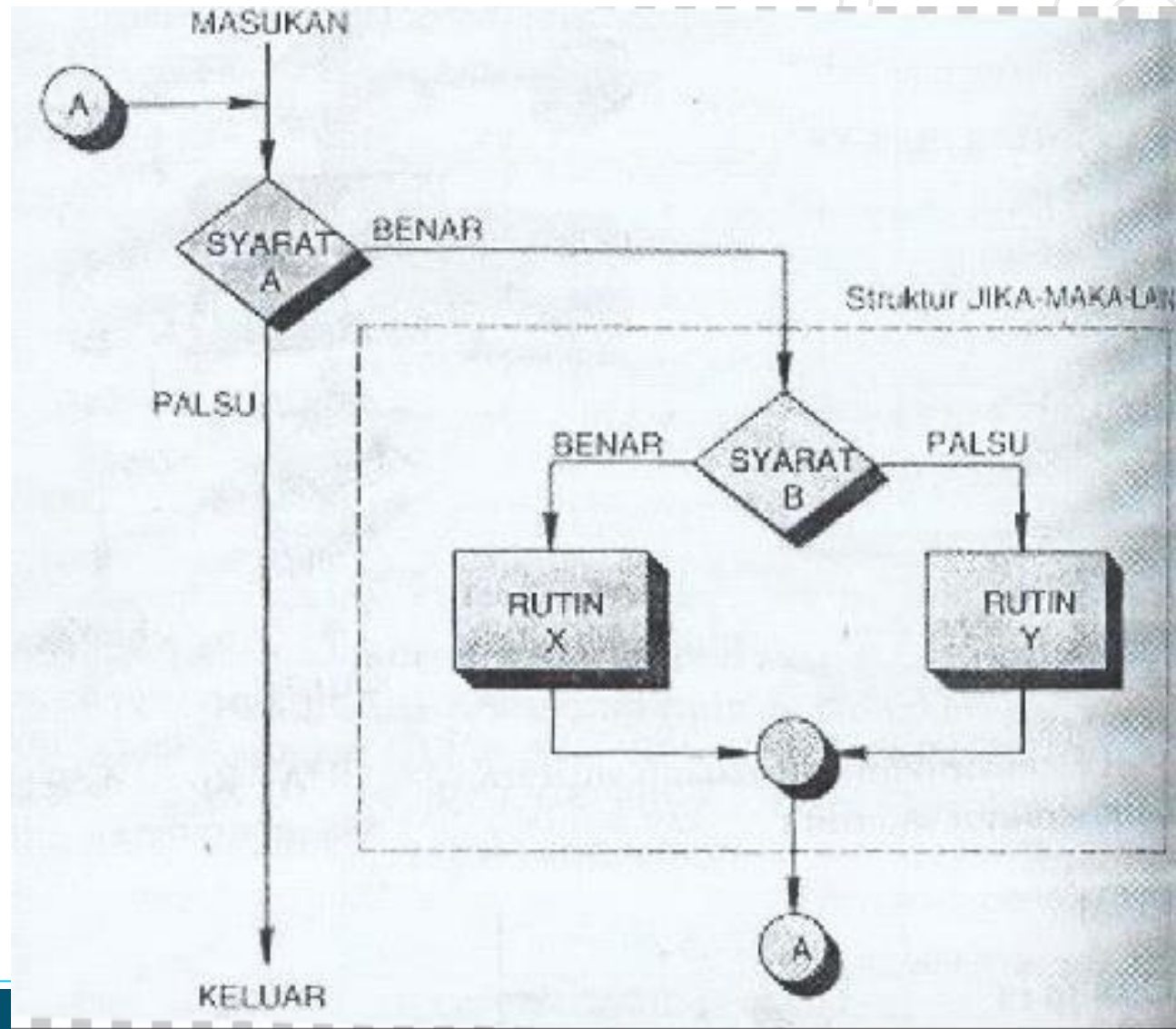
Structured Programming

Looping Structured



Structured Programming

Looping Structured + Dual Selection



| Class activity

- Dual Selection + Looping
- Ben has over 10 options for appointment as secretary. He wants to make decisions based on the following conditions:
Beautiful and single
- Review the 10 staff options to determine status (shortlisted)
-

Question and Answer