

Presented by ម៉ូតិច “Mux”

# Group Project

Digital logic and Computer architecture

Final project 2567

# PROJECT OVERVIEW

The project is about designing a Mini CPU using Digital software. The CPU will execute programs loaded into a 256x13-bit Program RAM (pRAM) and store results in a 256x8-bit Result RAM (rRAM)

Key components of the project include the Data Path, Control Unit, and appropriate memory and register handling.



Intro

# MEET THE GROUP



Circuit designer



Tanabodhi  
Mukura

Circuit designer



Supanut  
Udompataikul

Debugger/Tester/Circuit designer



Chayut  
Auanoppkun

Asm/data path

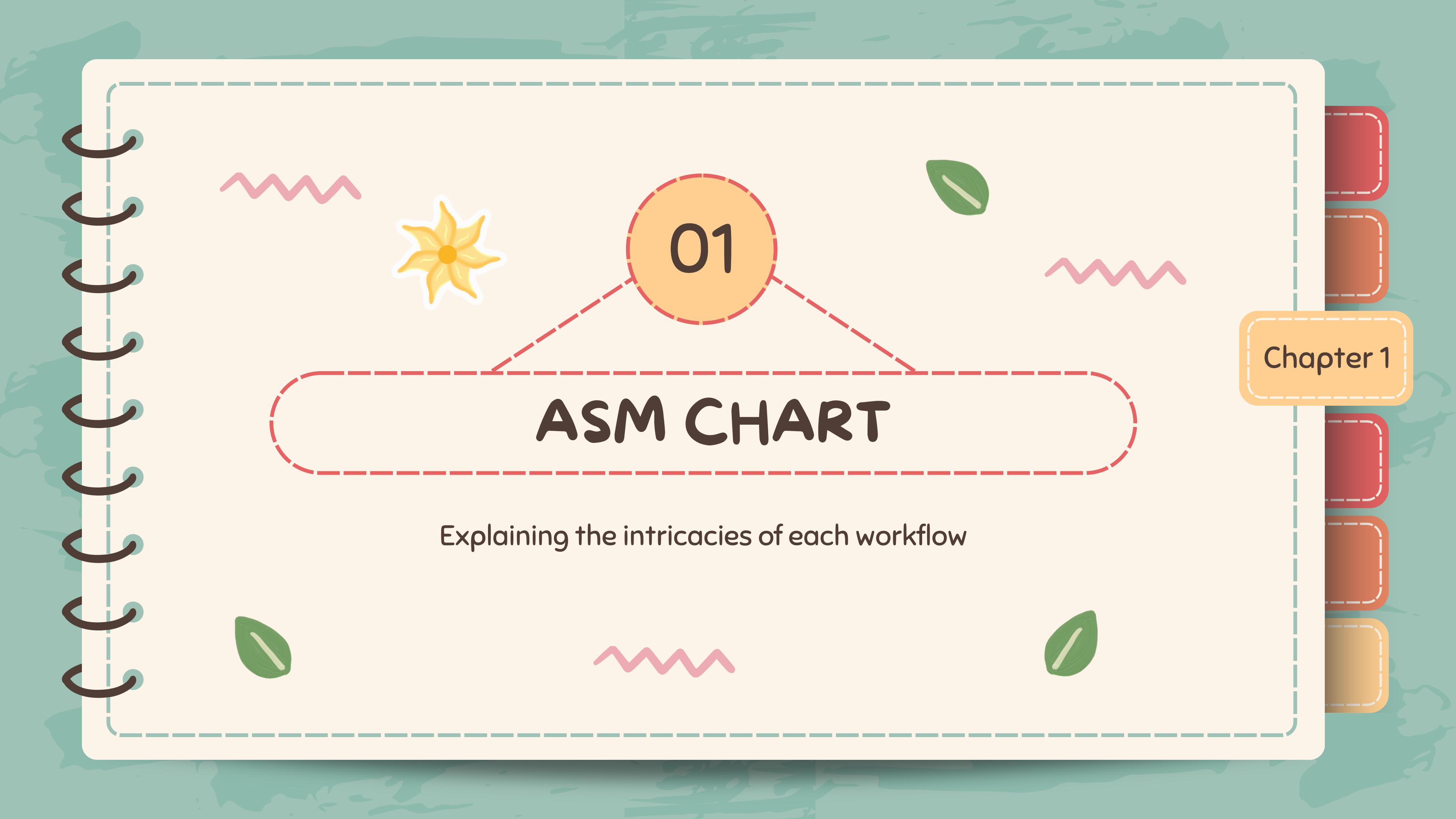


chanut  
chansangavej

# แนวคิดการออกแบบ CPU

The project is a foundational CPU simulation, introducing digital logic, instruction sets, and control flow. This CPU model will be capable of executing multiple arithmetic and logical operations while managing memory and displaying outputs. The design emphasizes a multi-cycle or pipeline structure for efficiency and better performance under test scenarios.



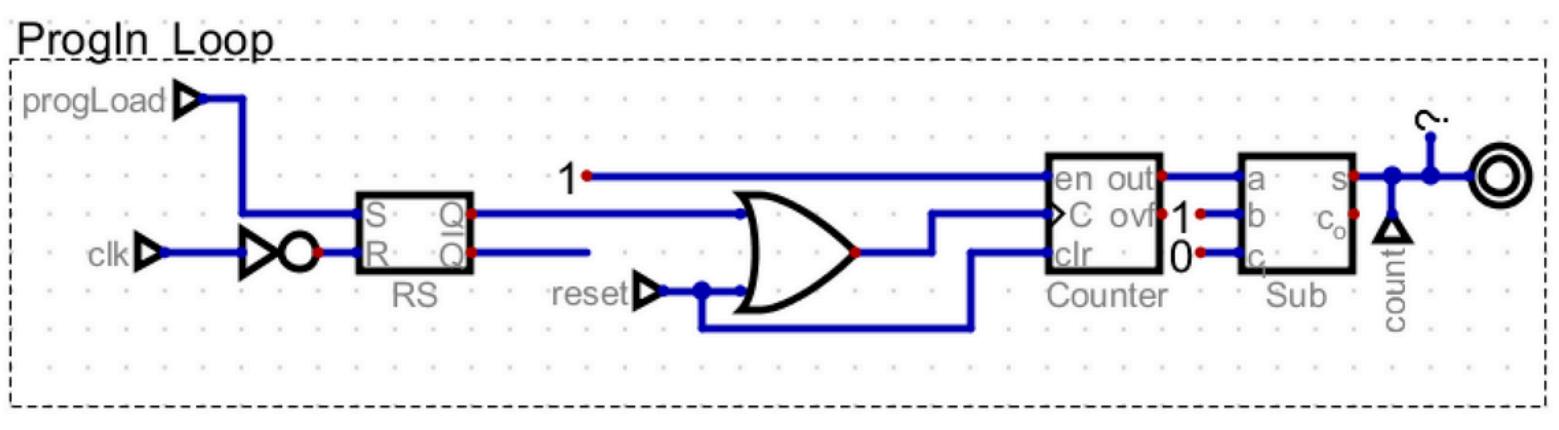
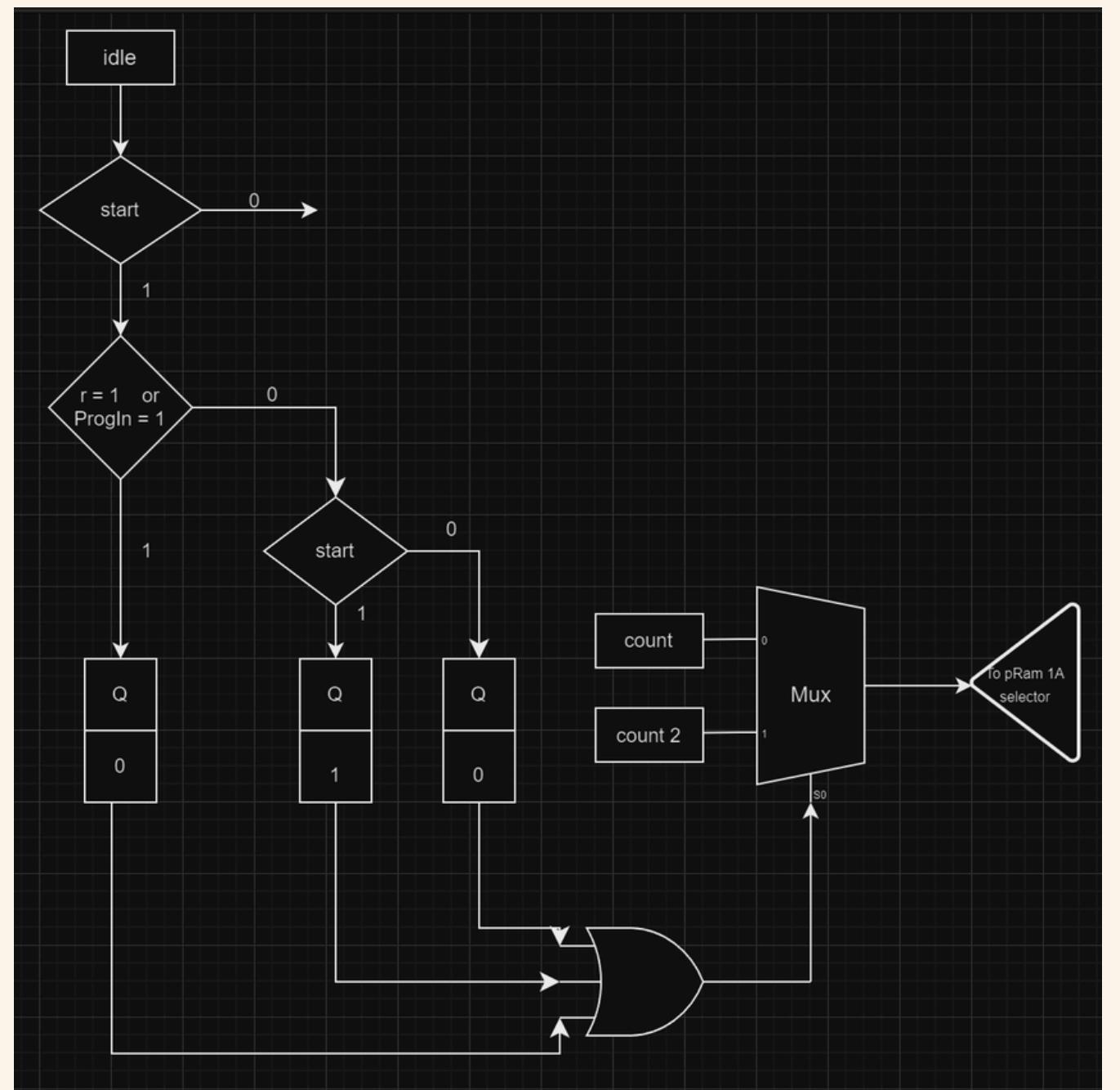


01

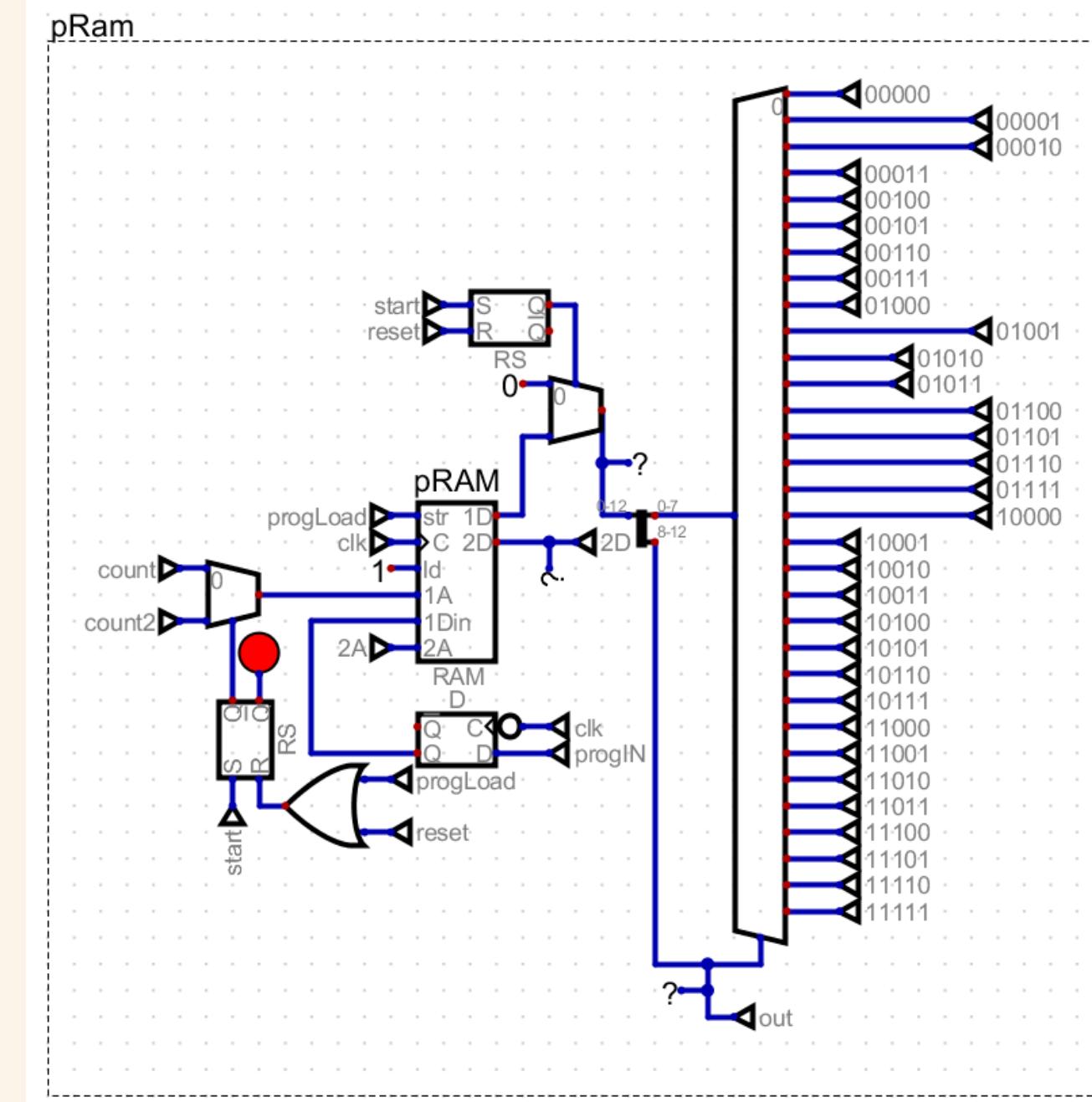
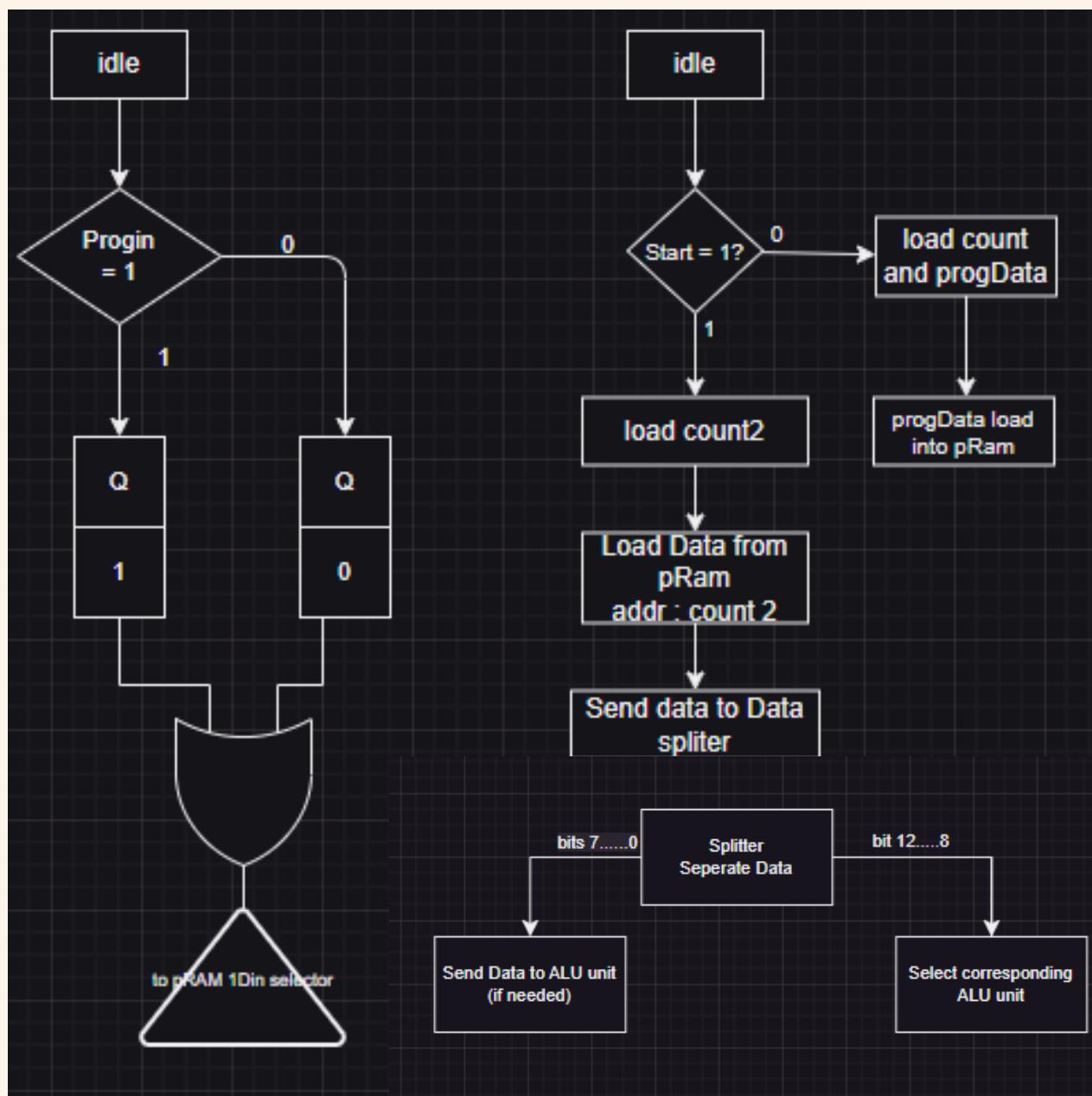
# ASM CHART

Explaining the intricacies of each workflow

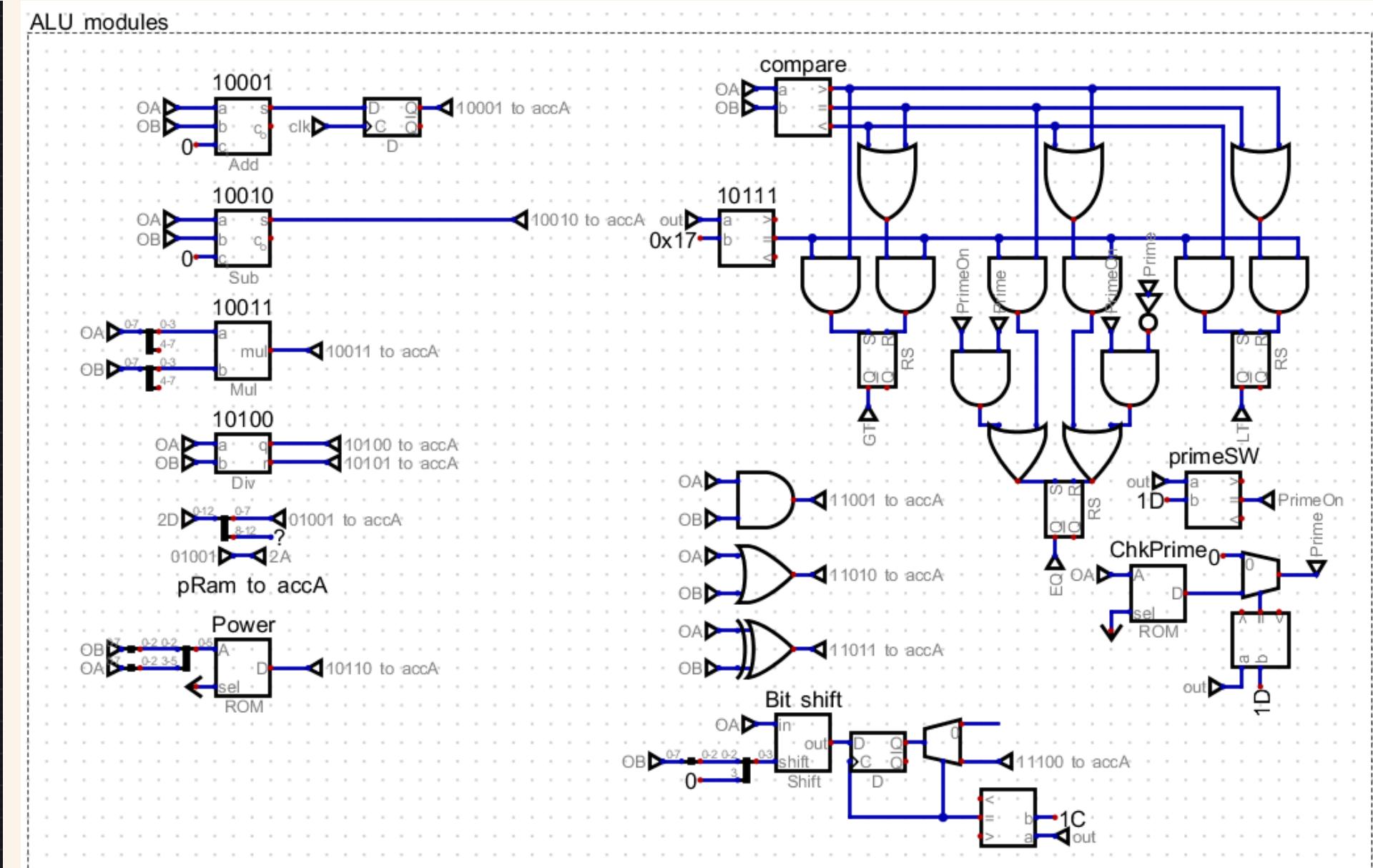
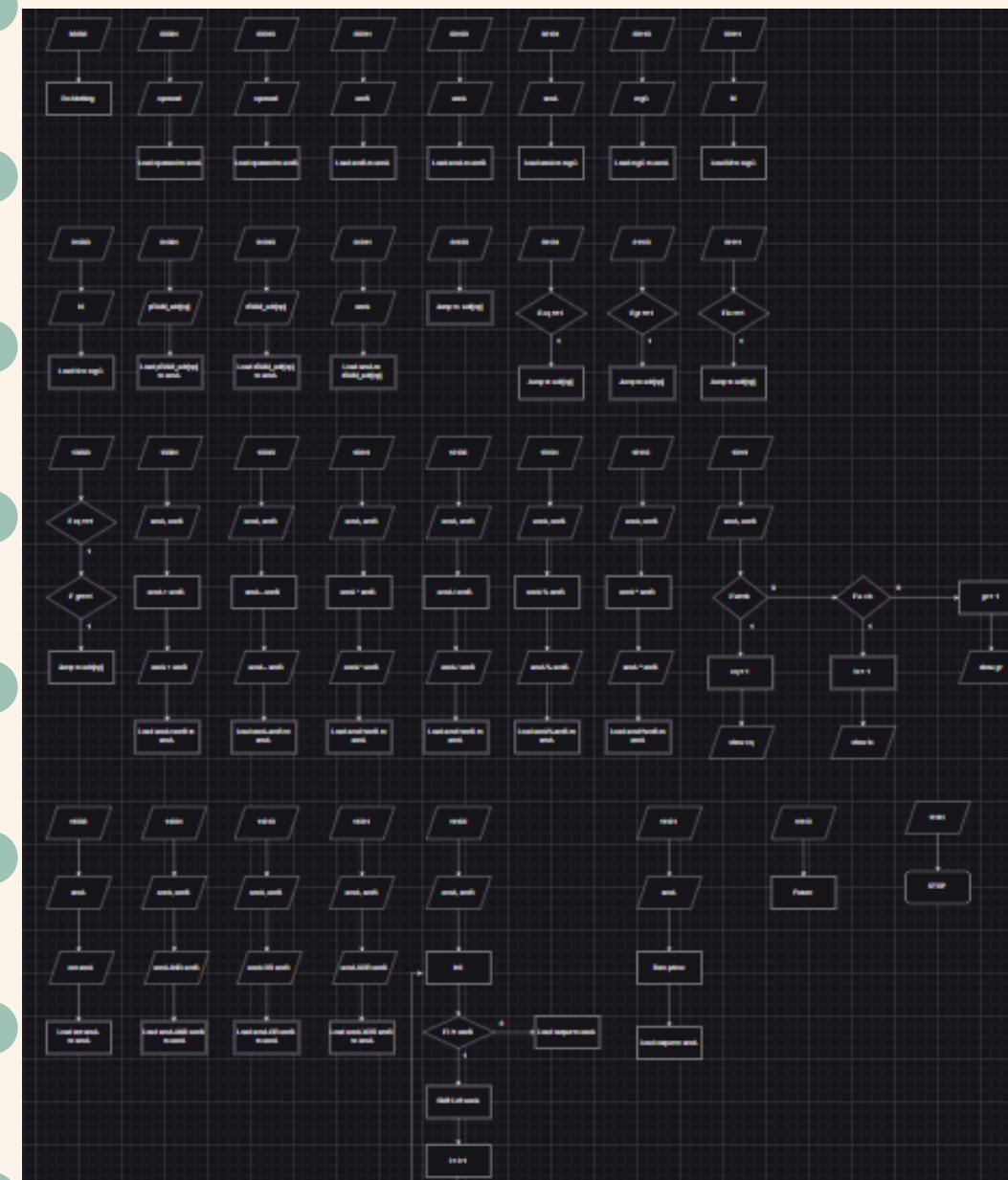
# PROGRAM IN-LOOP



# PROGRAM RAM



# ALU MODULES



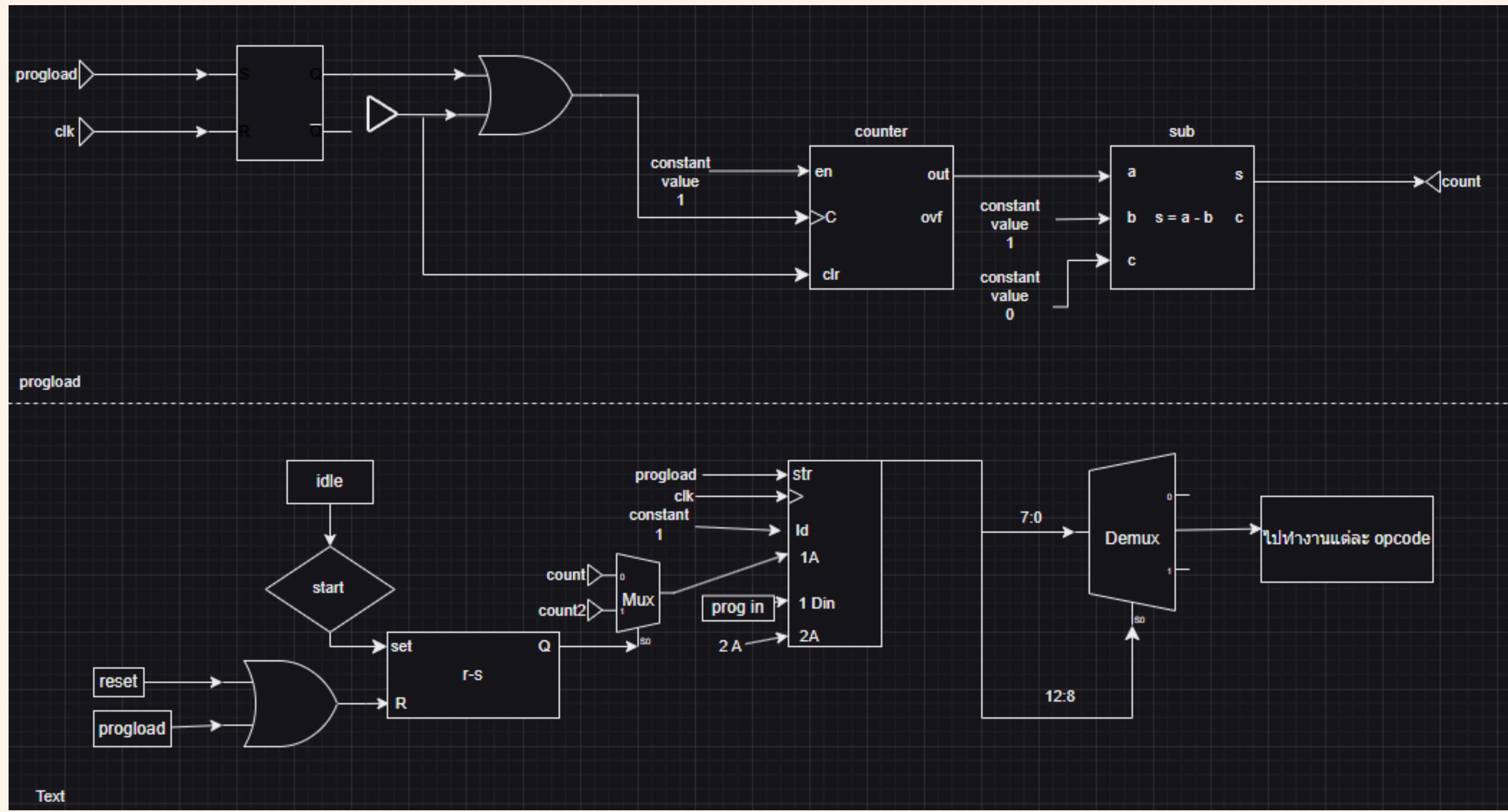
02

## การอุ่นแบบและพัฒนาส่วน DATA PATH

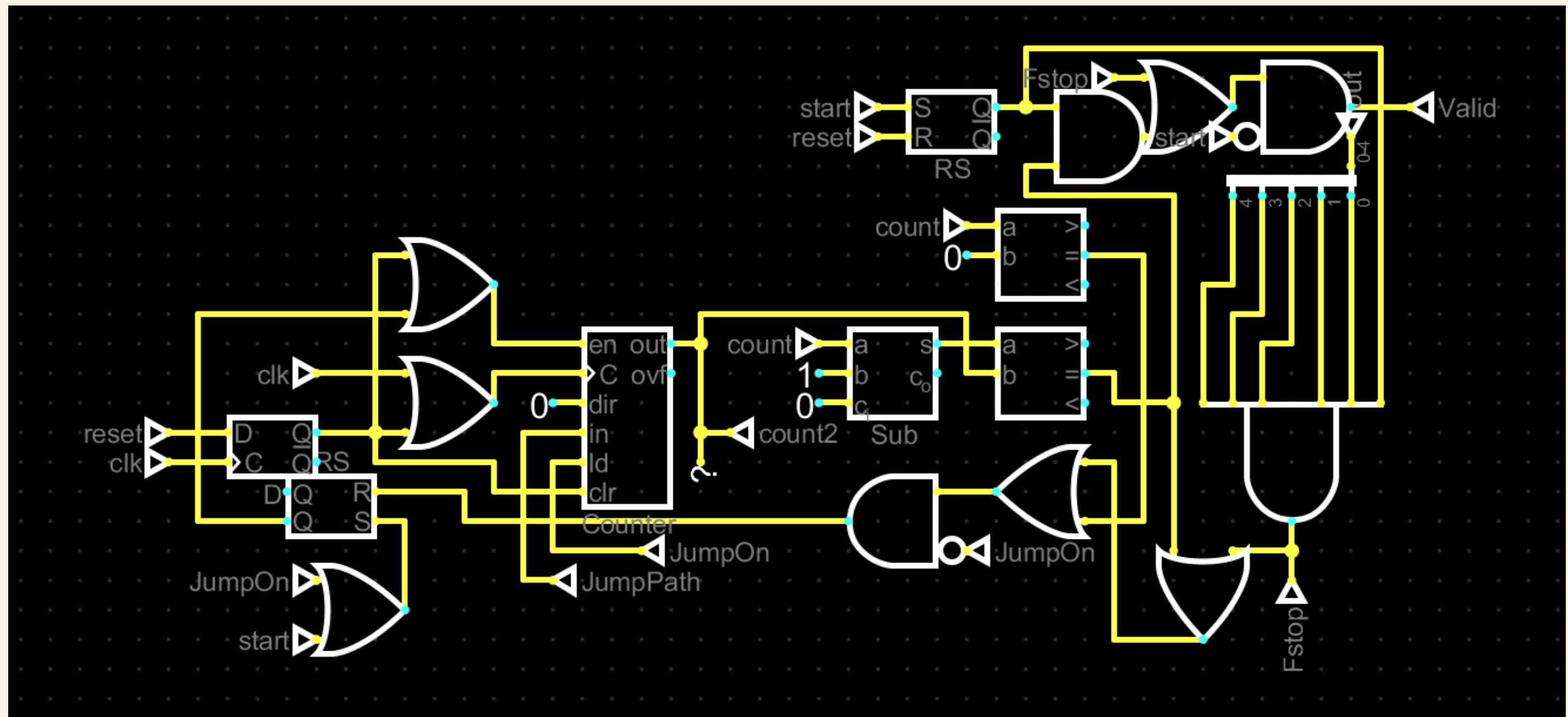
“The way of data”

Chapter 2

# DATAPATH



# CONTROLLER (MAIN LOOP)



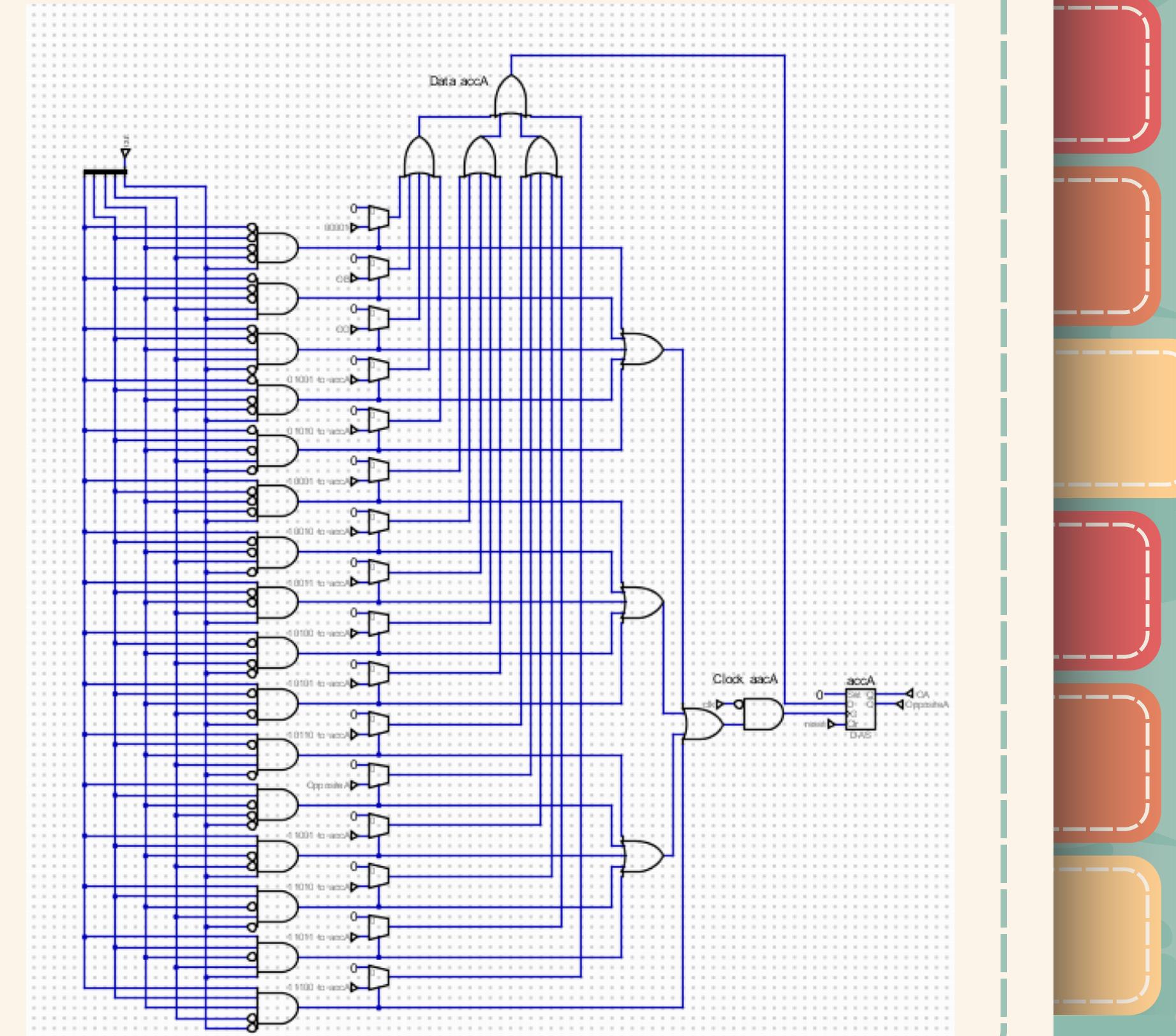
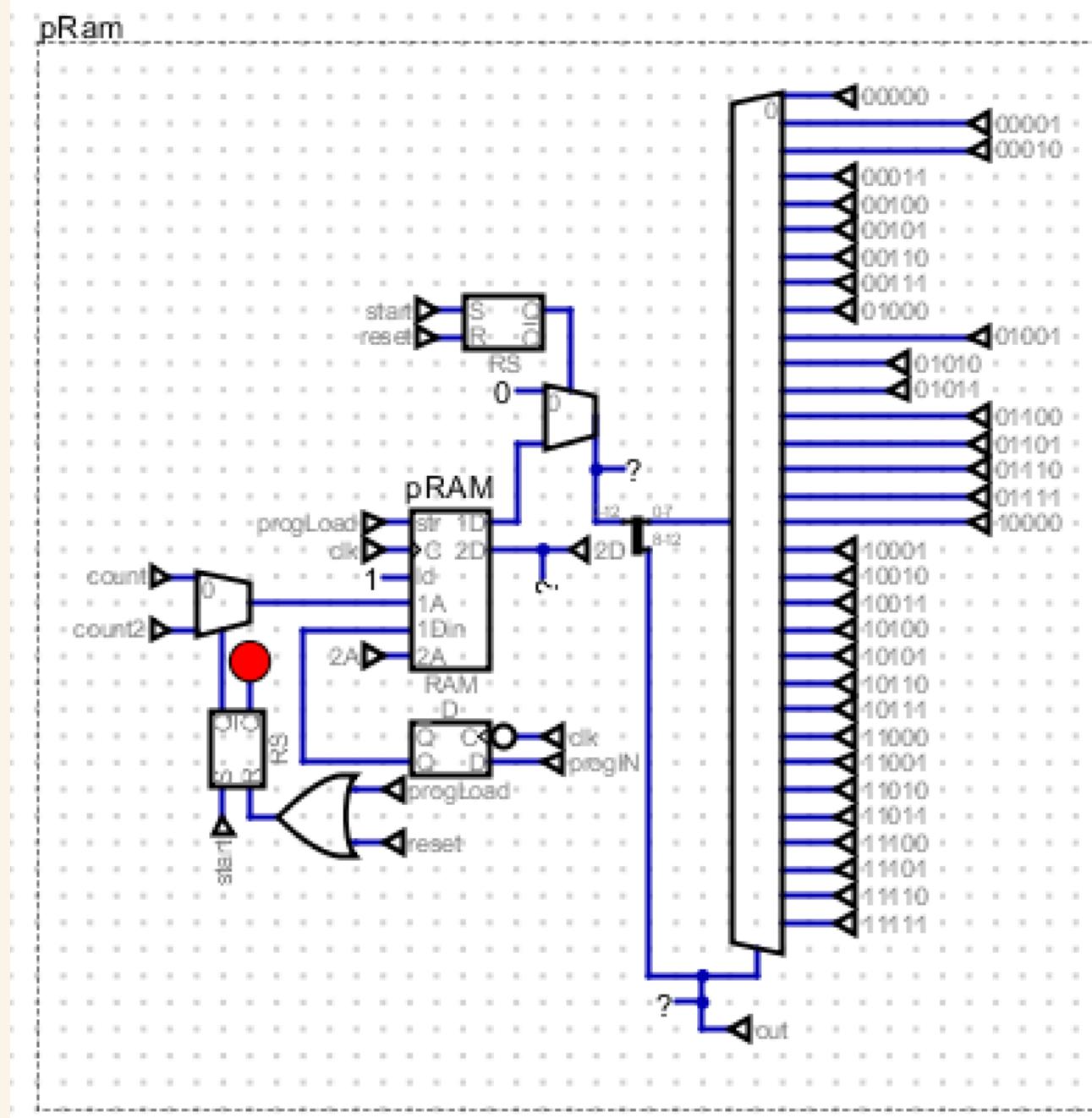
03

## การอุปกรณ์และพัฒนาส่วน **CONTROL UNIT**

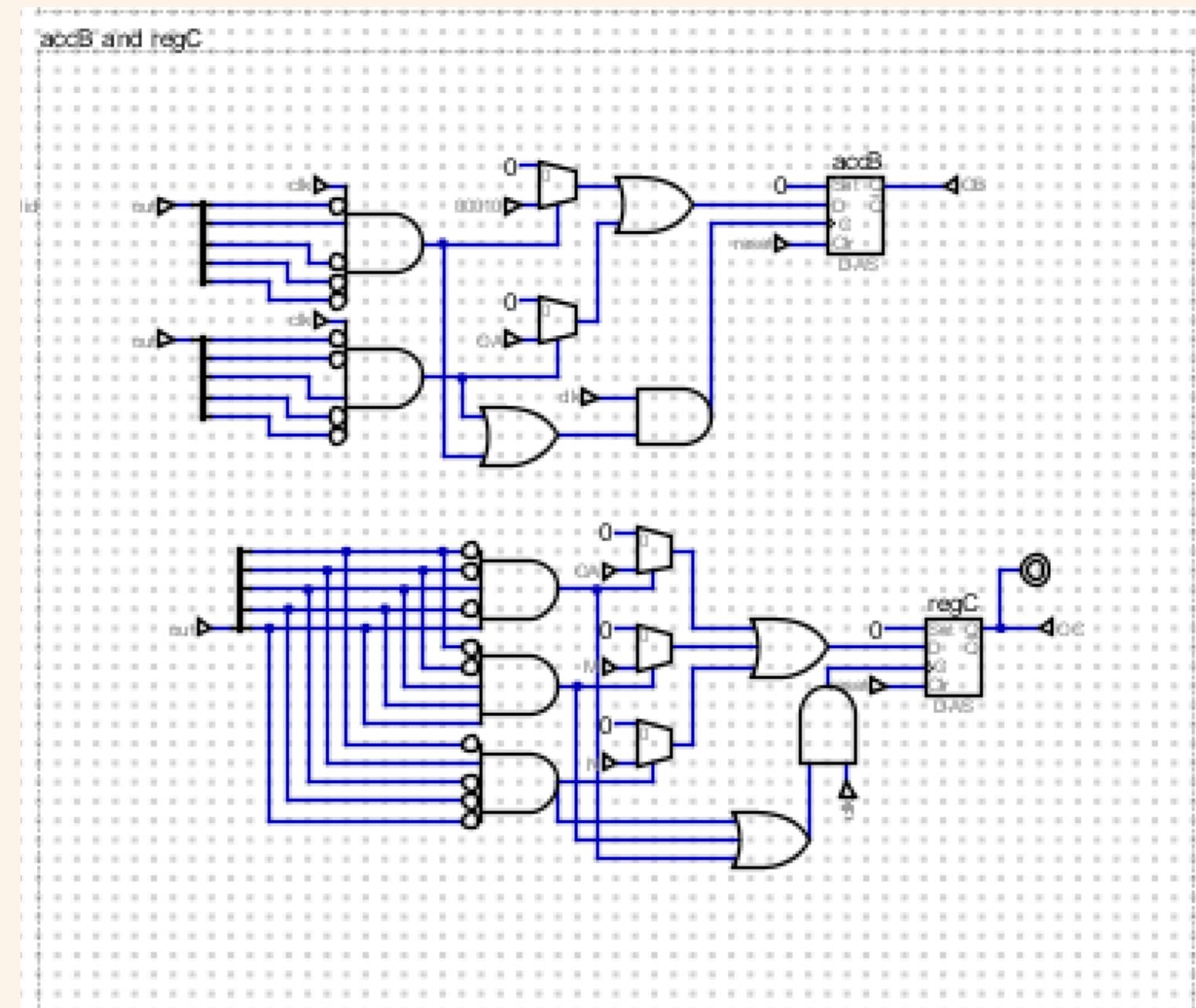
directing the operation

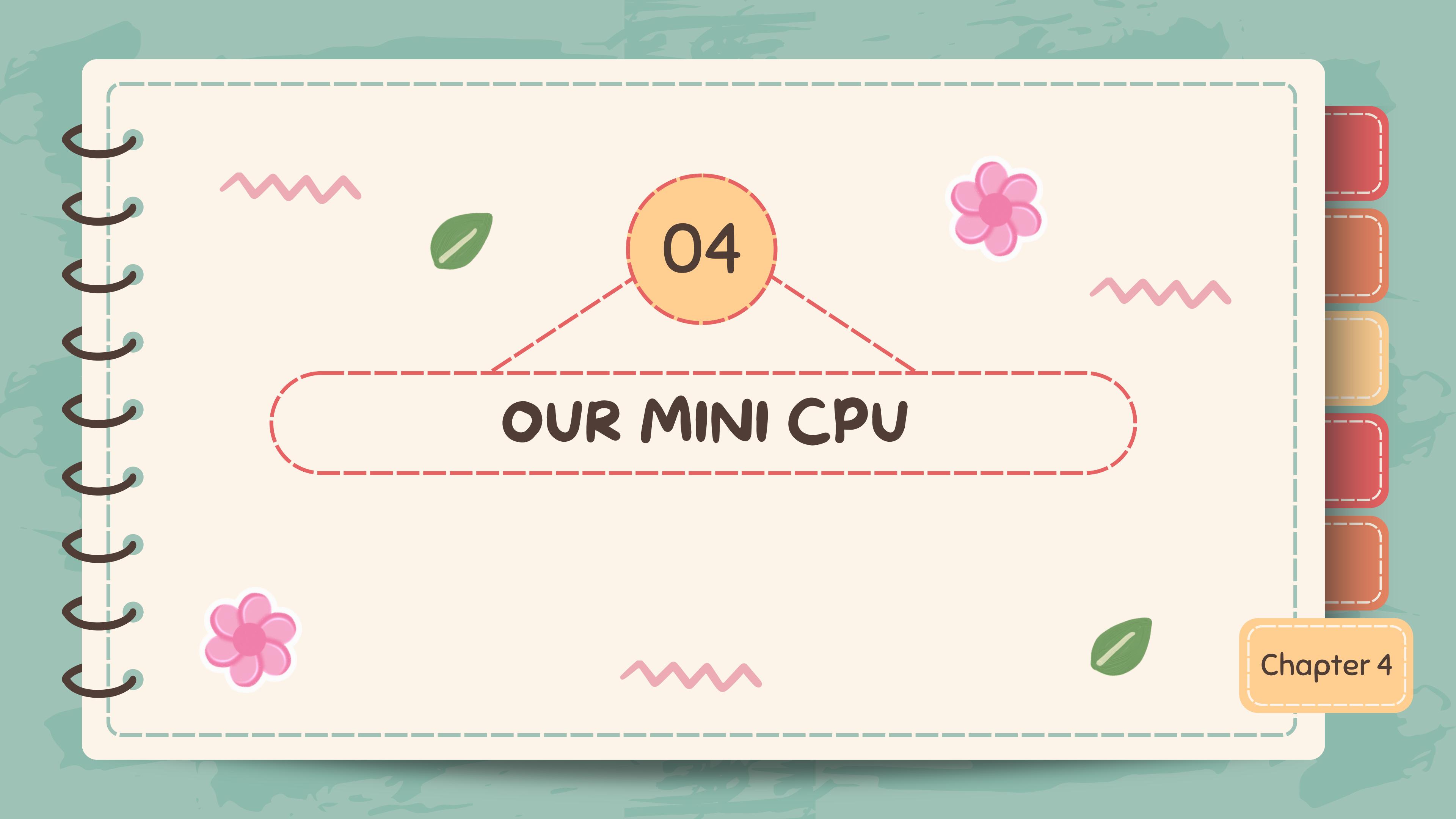
Chapter 3

# CONTROL UNIT



# CONTROL UNIT



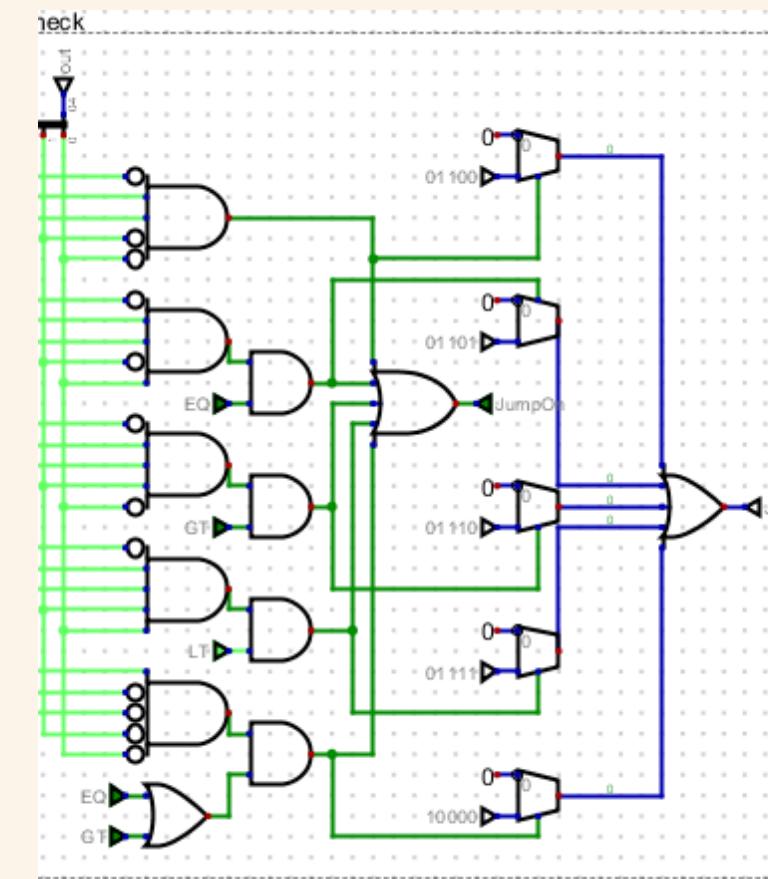
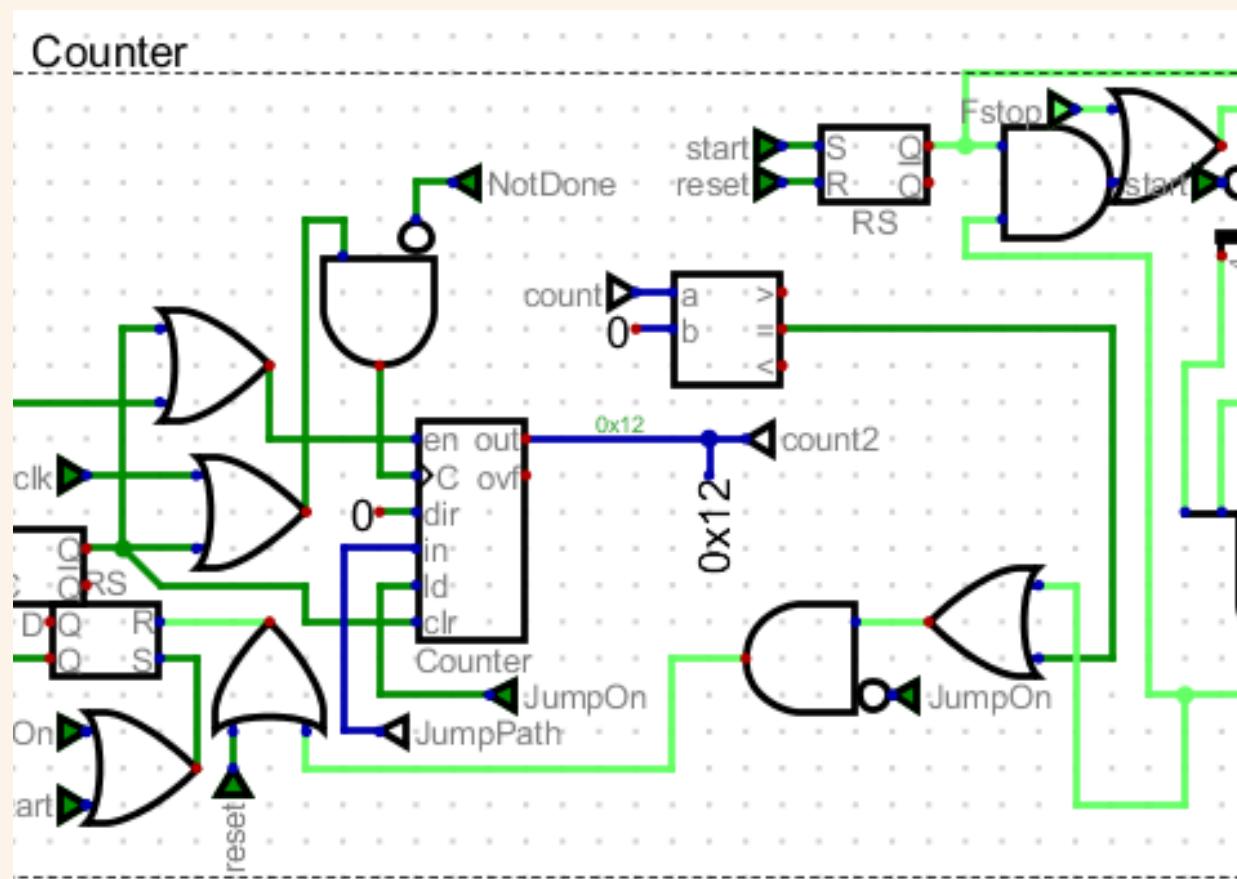
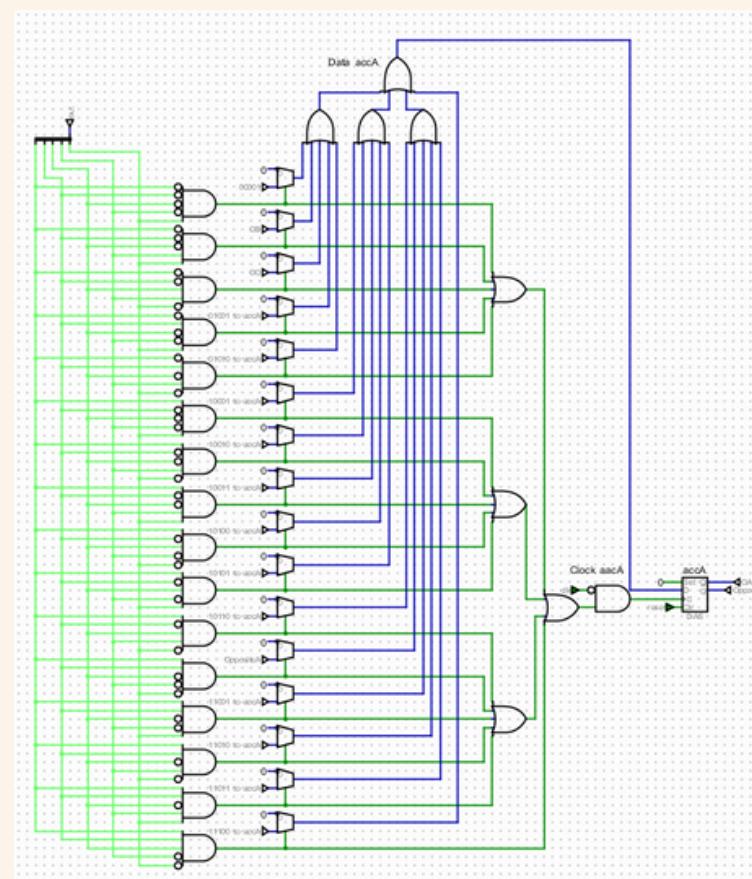


04

# OUR MINI CPU

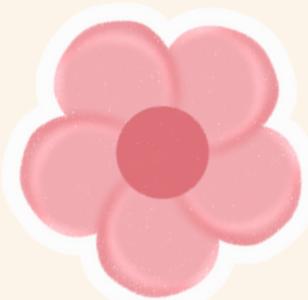
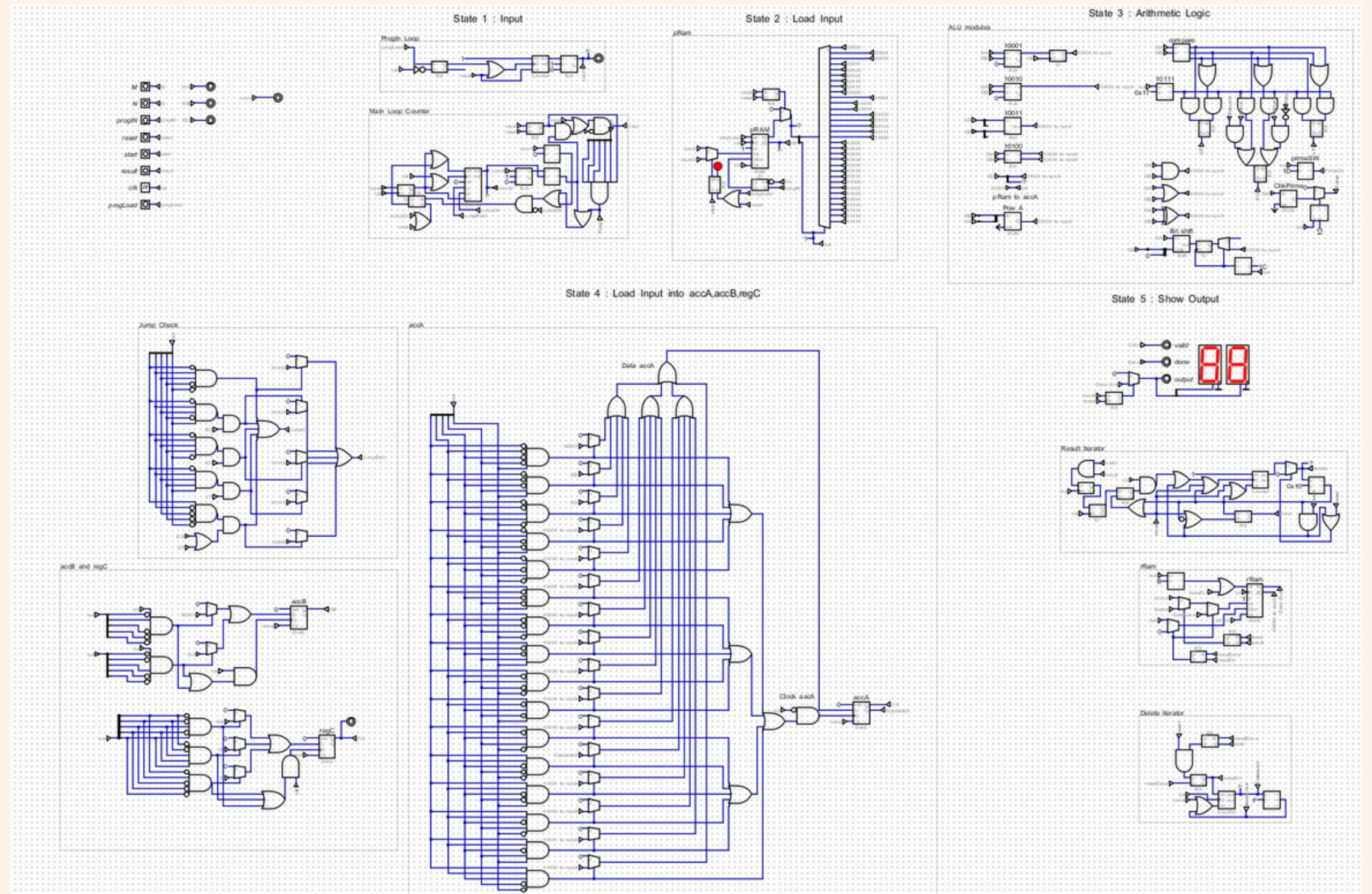
Chapter 4

# OUR MINI CPU



OUR MINI CPU IN ACTION

# OUR MINI CPU



# CONCLUSION

Our project was successfully completed without encountering any significant obstacles. Throughout the development process, we were able to design and implement the circuit efficiently, adhering to our initial timeline and objectives.

Our final circuit performed as expected, and we were able to meet all the requirements and specifications set by our instructor. The circuit successfully passed all of the provided test cases, demonstrating its functionality and reliability.

Overall, the project was a success, and we are confident that the skills and knowledge gained during this process will serve us well in the future.

# Thank You

By មីតិច “Mux”