



A A B University

Faculty of Computer Sciences

Introduction to Digital Technologies and Circuits

Week 14:

Practical Realization of Logic Circuits

Asst. Prof. Dr. **Mentor Hamiti**
mentor.hamiti@universitetiaab.com



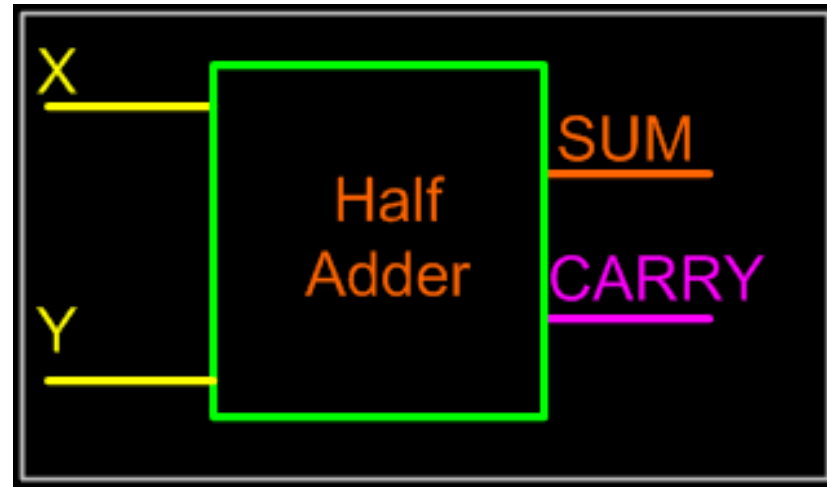
Main Steps:

1. Problem definition
2. Logic design
3. Simulation and testing
4. Specification
5. Practical realization
6. Testing and maintenance

1. Problem definition



- Example 1:
 - Practical Realization of Half Adder



2. Logic design



- Truth Table:

X	Y	SUM	CARRY
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

- K-Diagrams and Logic Expressions:

$$S(X, Y) = \overline{X} \cdot Y + X \cdot \overline{Y} = X \oplus Y$$

$$CARRY(X, Y) = X \cdot Y$$

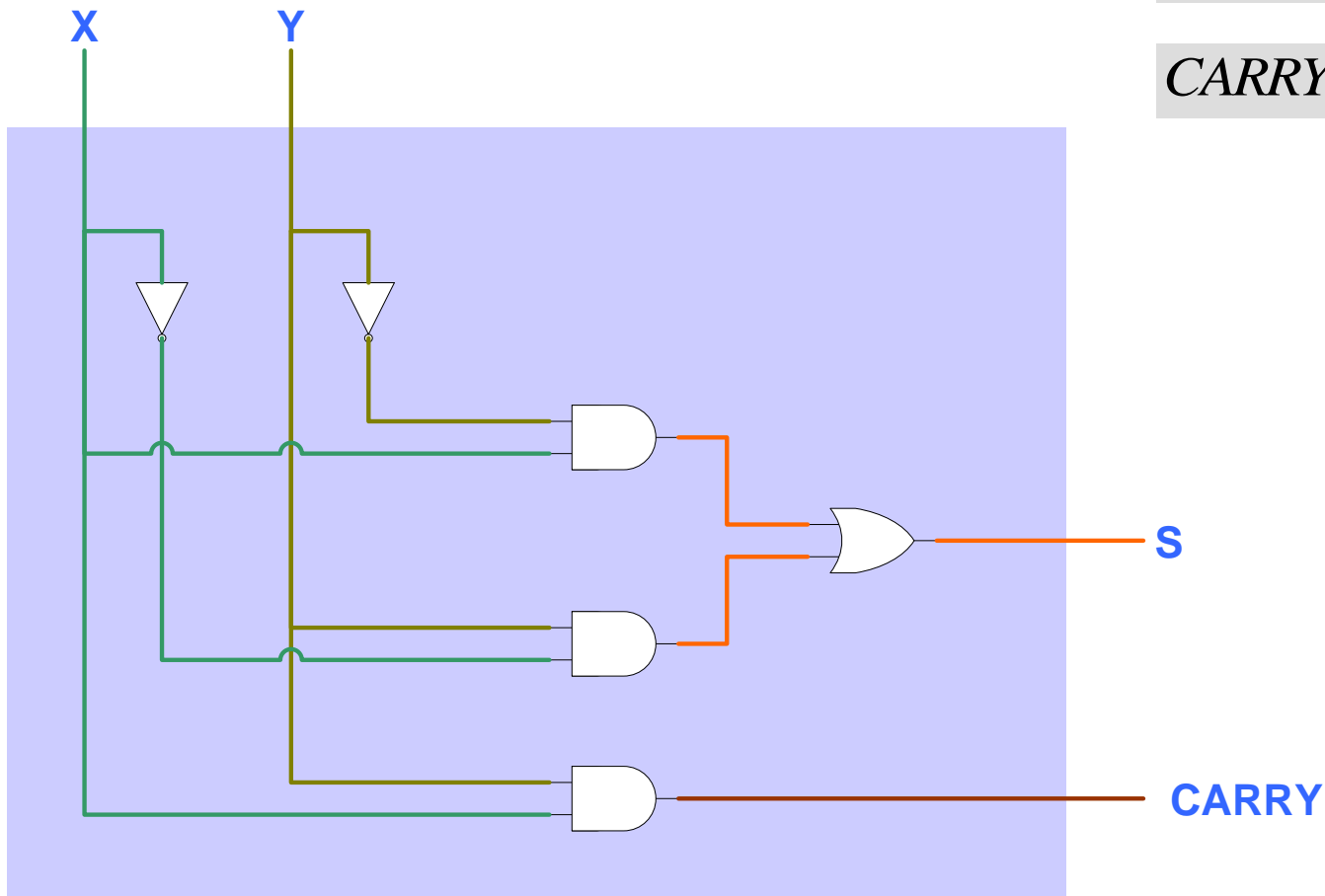
2. Logic design



- Logic Circuit Design:

$$S(X, Y) = \bar{X} \cdot Y + X \cdot \bar{Y}$$

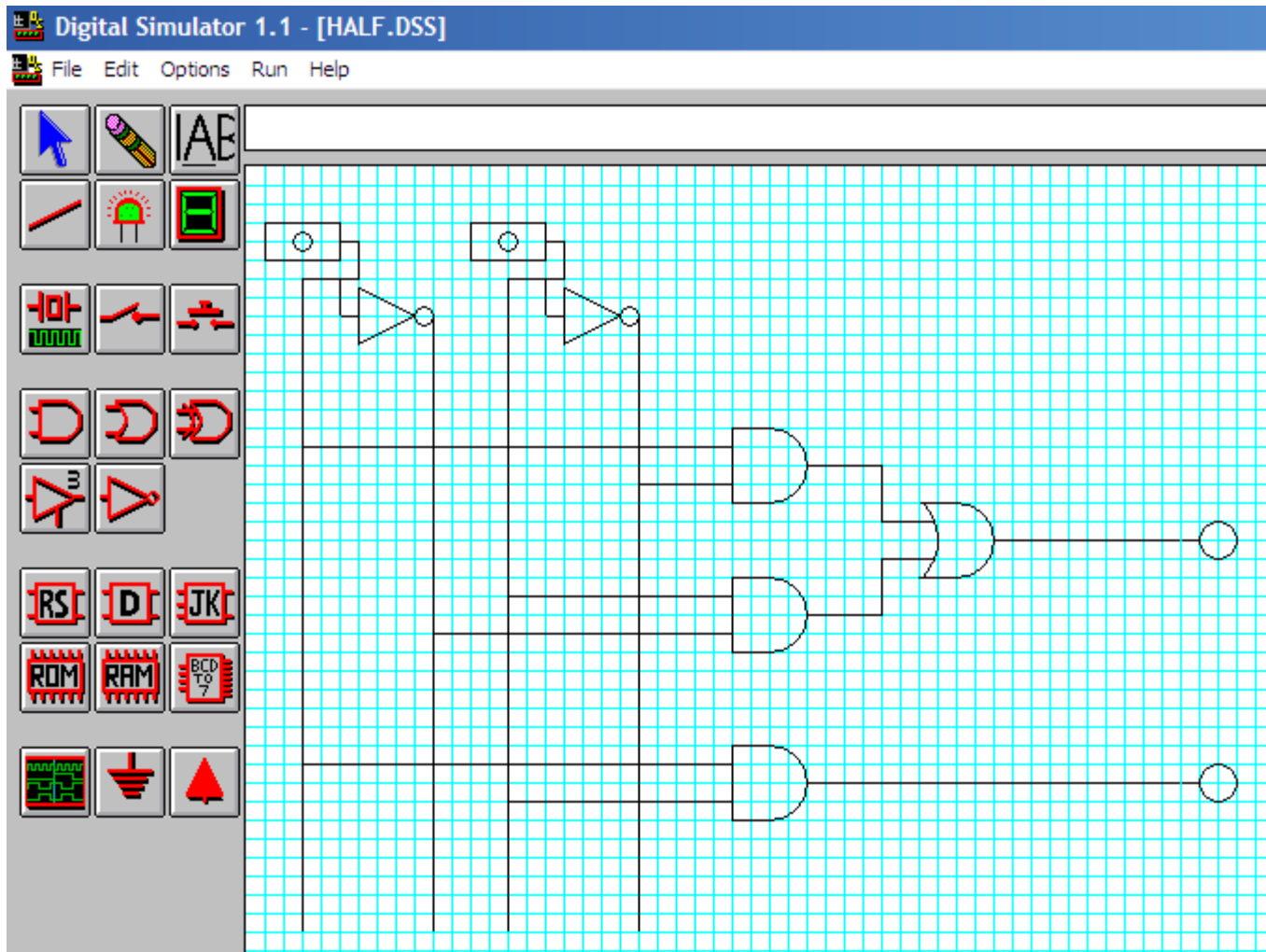
$$CARRY(X, Y) = X \cdot Y$$



3. Simulation and testing



- Simulator:

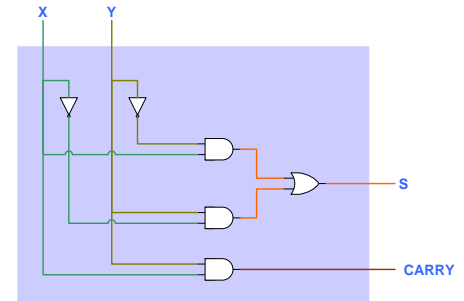


4. Specification



- Specification of needed equipments:

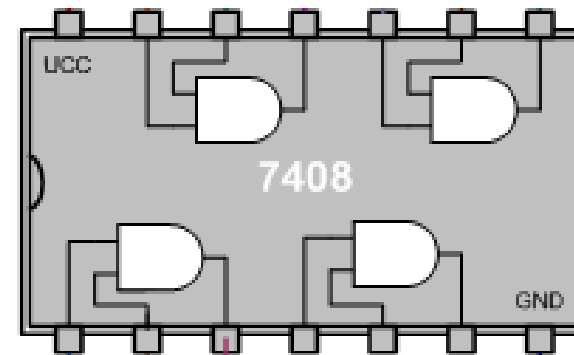
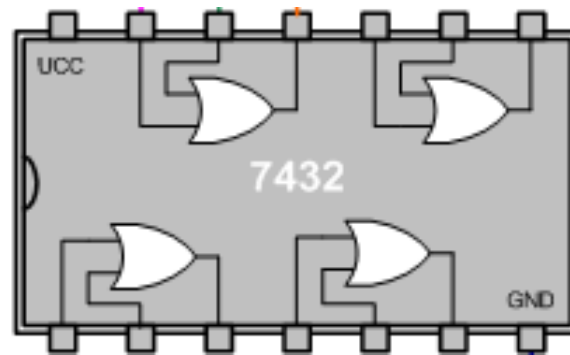
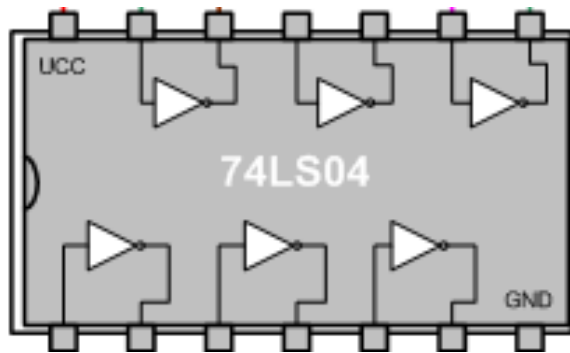
- Power supply
- Wires
- Logic Gates:
 - AND - 3
 - OR - 1
 - NOT - 2
- Resistors
- Diodes
-



5. Practical realization



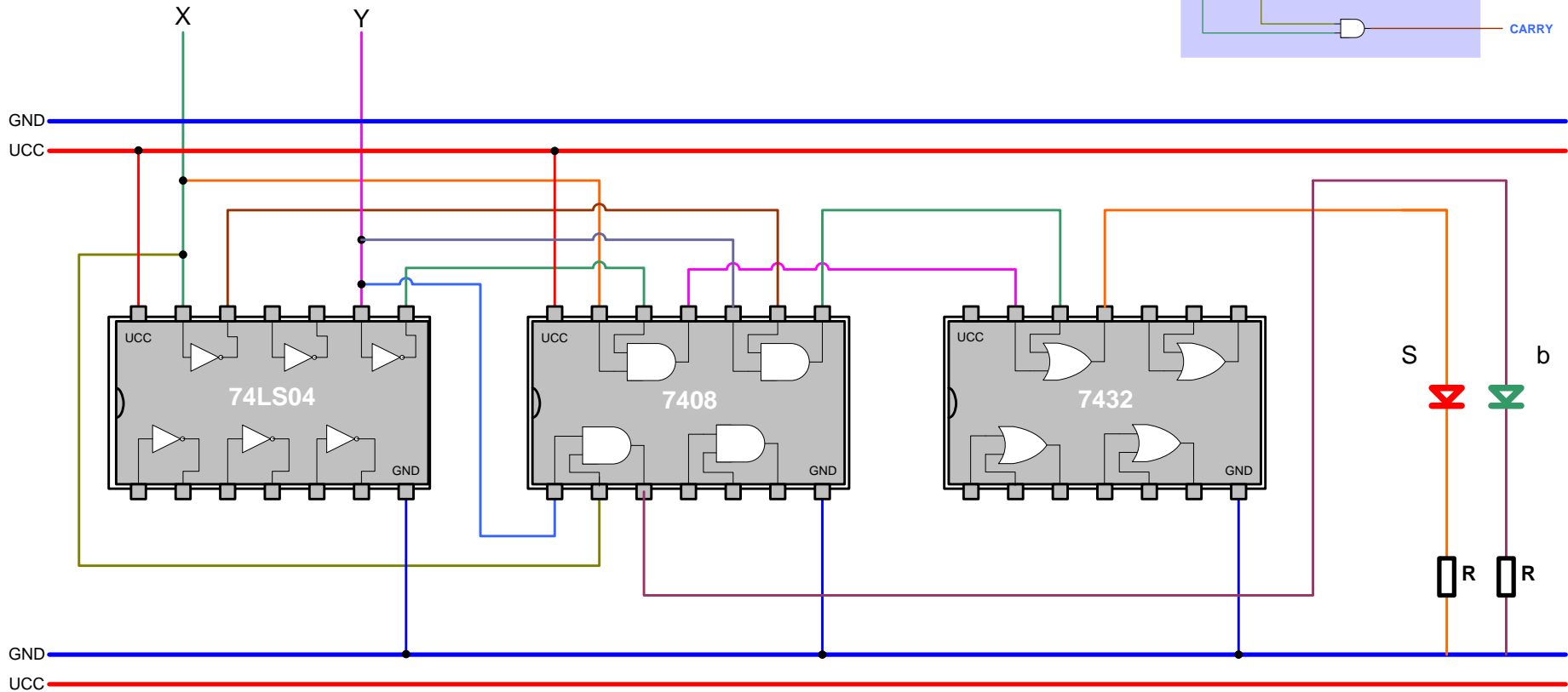
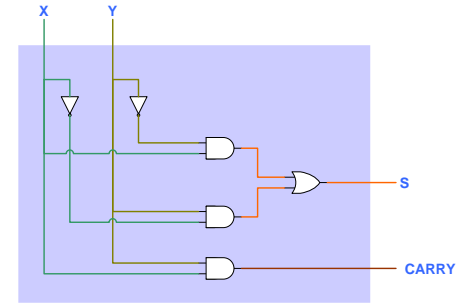
- Electronic Components:



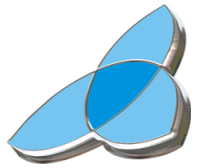
5. Practical realization



■ Experimental Board:



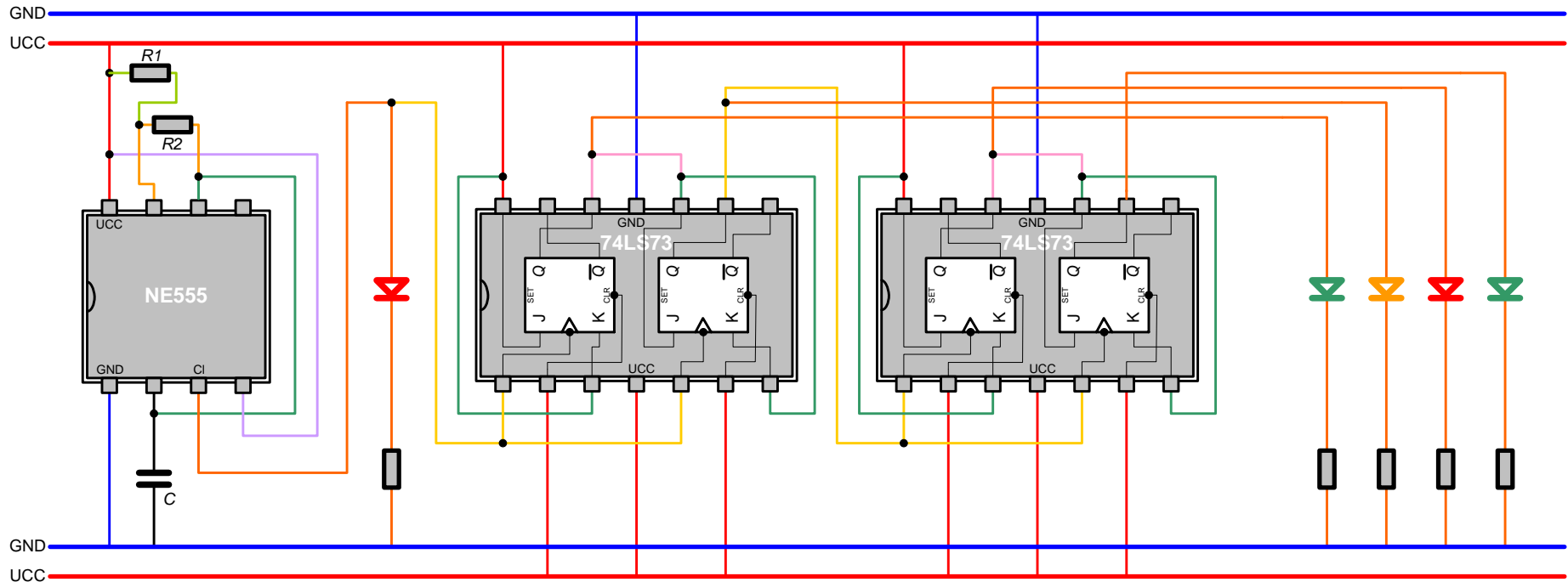
6. *Testing and maintenance*



- Finalization of Product:
 - Static Board
 - Testing
 - Maintenance
 - Technology
 -



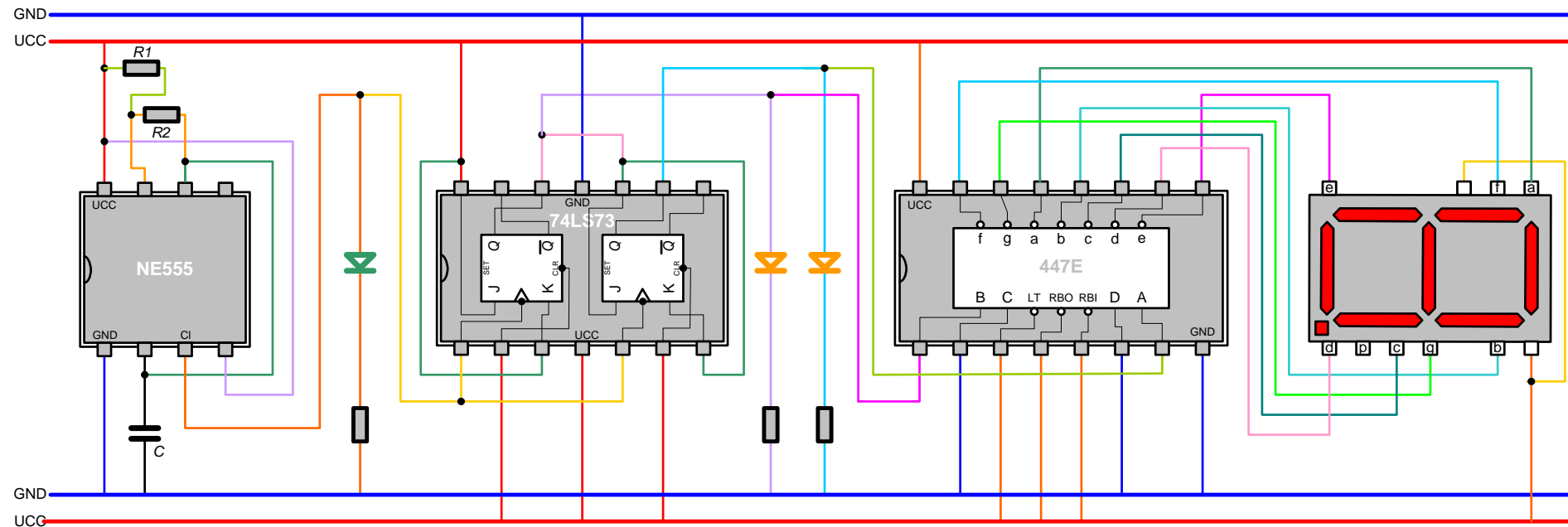
■ Example 2:



Binary Counter



■ Example 3:



Binary Counter



- Questions?!

