



Lab Report

LAB — 06

CSE — 206

Presented By:

- **Name:** Tunazzinur Rahman Kabbo
- **Intake:** 44
- **Sec:** 07
- **ID:** 19202103268

CSE — 206

Presented To:

❖ **Iffat Tamanna**

Lecturer, BUBT

Department of Computer Science & Engineering

Email: iffat@bubt.edu.bd

Lab-06

Name of the experiment: check the operation of 2 to 4 line decoder and 3 to 8 line decoder.

Description:

A decoder is a circuit that changes a code into a set of signals. A common type of decoder is the line decoder which takes an n -digit binary number and decodes it into 2^n data lines.

2 to 4 line decoder: This 2 to 4 line decoder includes two inputs (x, y) and four outputs (D_0, D_1, D_2, D_3).

Truth Table:

| X | Y | D_0 | D_1 | D_2 | D_3 |
|---|---|-------|-------|-------|-------|
| 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 | 0 | 1 |

$$D_0 = X'Y'$$

$$D_2 = XY'$$

$$D_1 = X'Y$$

$$D_3 = XY$$

3 to 8 line decoder: In this decoder there are three inputs (X, Y, Z) and eight outputs $(D_0, D_1, D_2, D_3, D_4, D_5, D_6, D_7)$

Truth Table:

| X | Y | Z | D_0 | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_7 |
|---|---|---|-------|-------|-------|-------|-------|-------|-------|-------|
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

$$D_0 = X'Y'Z'$$

$$D_1 = X'Y'Z$$

$$D_2 = X'YZ'$$

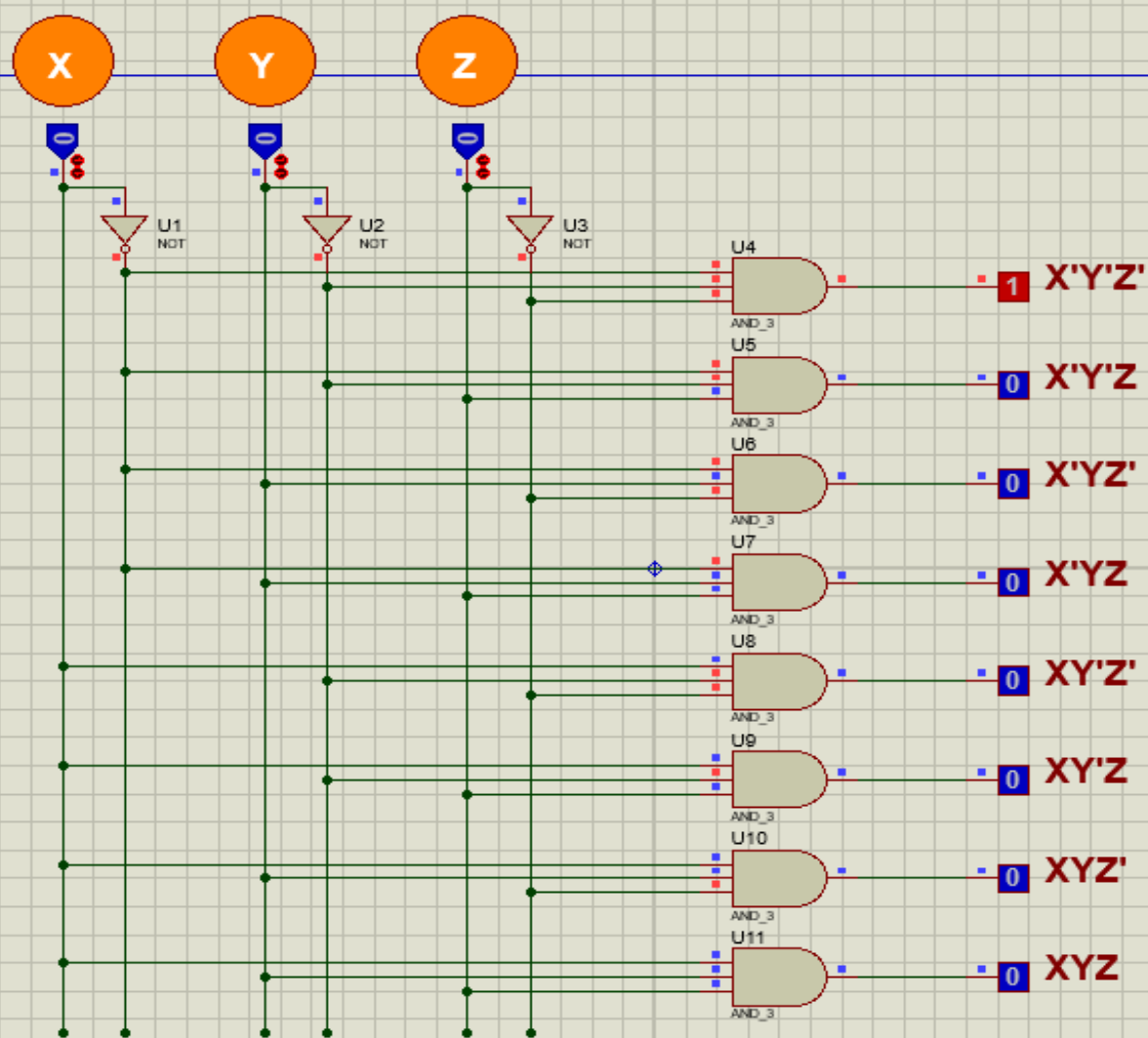
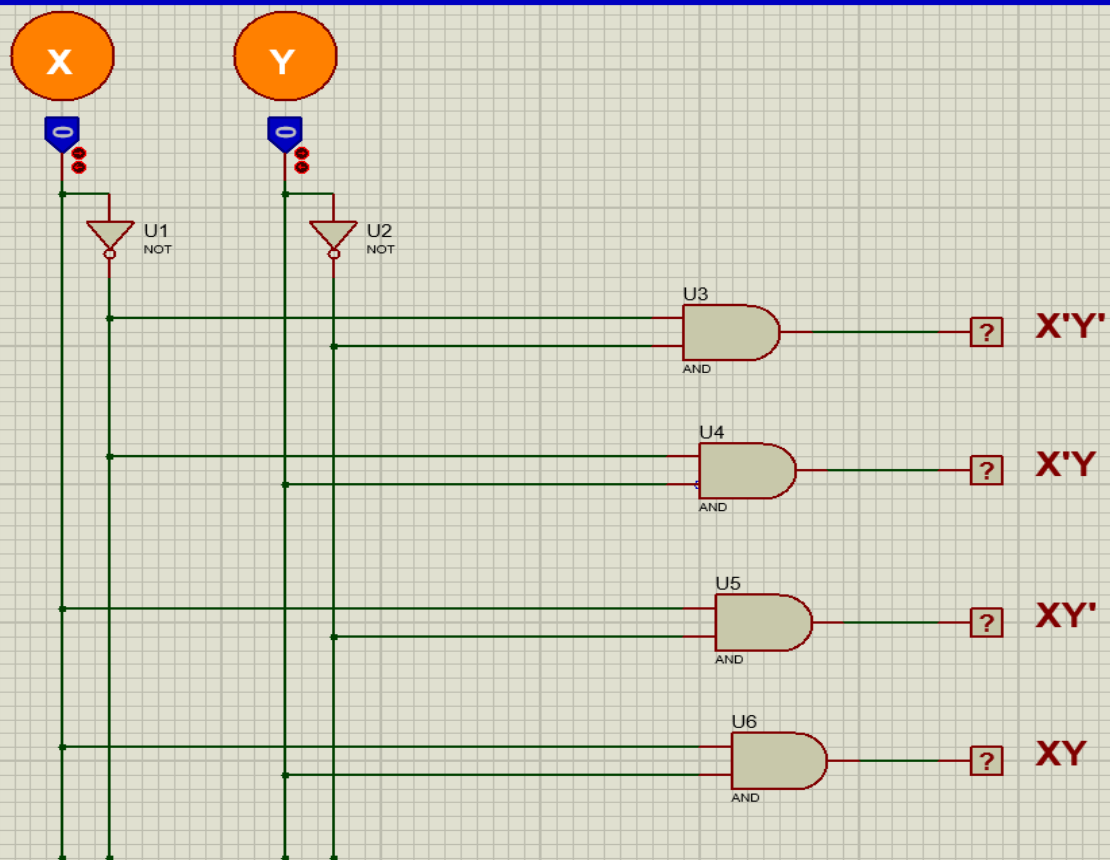
$$D_3 = X'YZ$$

$$D_4 = XY'Z'$$

$$D_5 = XY'Z$$

$$D_6 = XYZ'$$

$$D_7 = XYZ$$



Conclusion:

- (i) We have learnt what is 2 to 4 line decoder and 3 to 8 line decoder.
- (ii) We have learnt how to implement 2 to 4 line and 3 to 8 line decoder, via logic gates.
- (iii) We have learnt how to find out the relation between input and output of a decoder.

THE END
