وزارة التعليم العالي والبحث العلمي كلية المستقبل الجامعة مختبر/ الكترونيك رقمي	م.ايلاف عبدعلي
	المرحلة : الاولى
سجل التجارب	

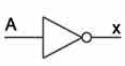
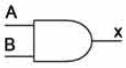
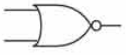
Experiment No.:- 2

Experiment name: - LOGIC GATES

Objective: - To study and verify the truth table of logic gates

Equipment and tools: - Program (Multisim)

Logic Gates

Name	NOT	AND	NAND	OR	NOR	XOR	XNOR
Alg. Expr.	$\overline{A}$	AB	$\overline{AB}$	$A+B$	$\overline{A+B}$	$A \oplus B$	$\overline{A \oplus B}$
Symbol							
Truth Table	A X 0 1 1 0	B A X 0 0 0 0 1 0 1 0 0 1 1 1	B A X 0 0 1 0 1 1 1 0 1 1 1 0	B A X 0 0 0 0 1 1 1 0 1 1 1 1	B A X 0 0 1 0 1 0 1 0 0 1 1 0	B A X 0 0 0 0 1 1 1 0 1 1 1 0	B A X 0 0 1 0 1 0 1 0 0 1 1 1

Theory: - The basic logic gates are the building blocks of more complex logic circuits. These logic gates perform the basic Boolean functions, such as AND, OR, NAND, NOR, Inversion, Exclusive-OR, Exclusive-NOR. Fig, below shows the circuit symbol, Boolean function, and truth. It is seen from the Fig that each gate has one or two binary inputs, A and B, and one binary output, C. The small circle on the output of the circuit symbols designates the logic complement. The AND, OR,

NAND, and NOR gates can be extended to have more than two inputs. A gate can be extended to have multiple inputs if the binary operation it represents is commutative and associative.

Procedure:-

1.Check the components for their working .

2.Insert the appropriate IC into the IC base .

3. Make connections as shown in the circuit diagram.

4. Provide the input data via the input switches and observe the output on output LEDs

Tools required for circuit design:

مجهز القدرة (Power supply - VCC)

Place → Component⇒ SOURCE⇒ POWER SOURCES →VCC

المؤرض (Ground - GND)

Place → Component→ SOURCE POWER SOURCES →GROUND

المفاتيح (Switch-SPDT)

Place → Component →Basic → SWITCH→SPDT

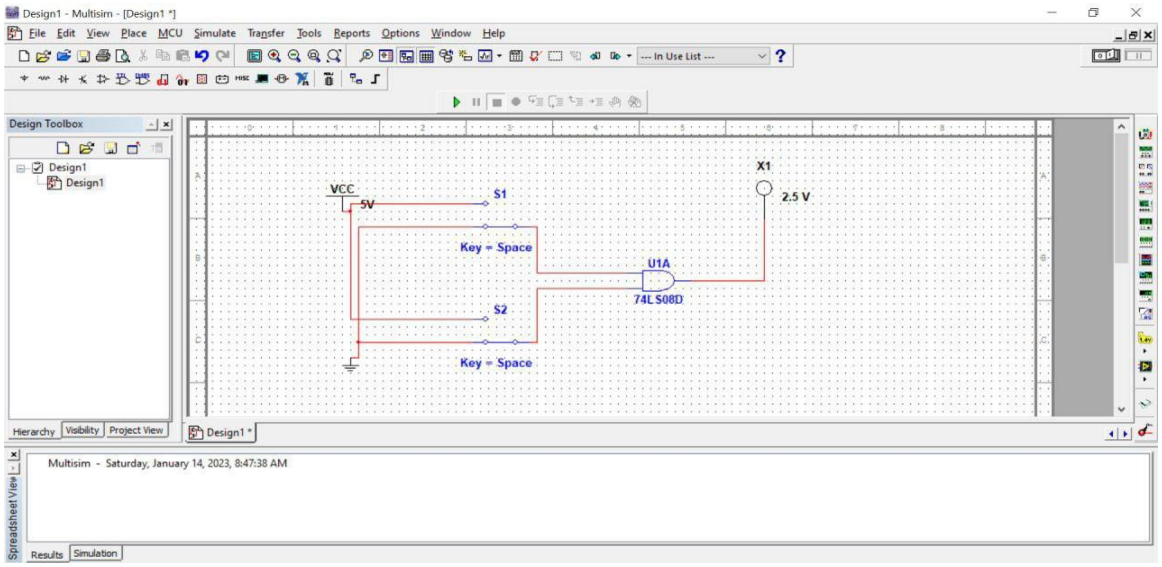
بوابة الضرب المنطقية (74LSO8D)

Place → Component →TTL→74LS→⇒74LS08D

المصابيح (Indicator -Probe)

Place → Component →Indicators →Probe → Probe blue

IC number	Logic Gate
74LS08	AND gate
74LS00	NAND gate
74LS32	OR gate
74LS02	NOR gate
74LS86	EX-OR gate
74LS04	Inverter or NOT gate
74HC266	EX-NOR gate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Design Toolbox
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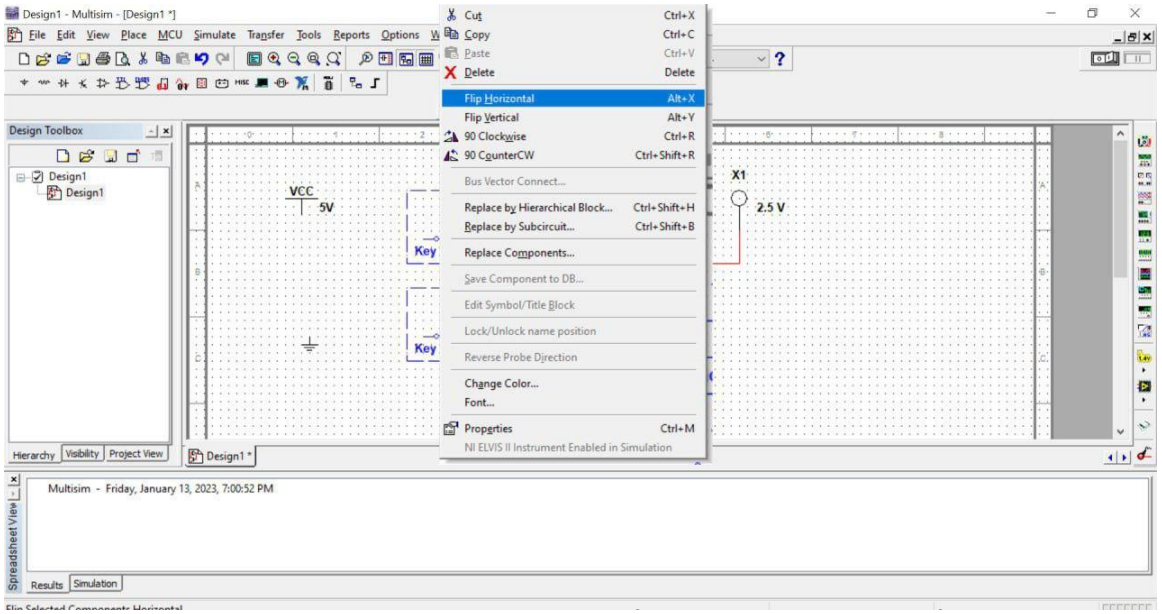
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Replace by Subcircuit... Ctrl+Shift+B
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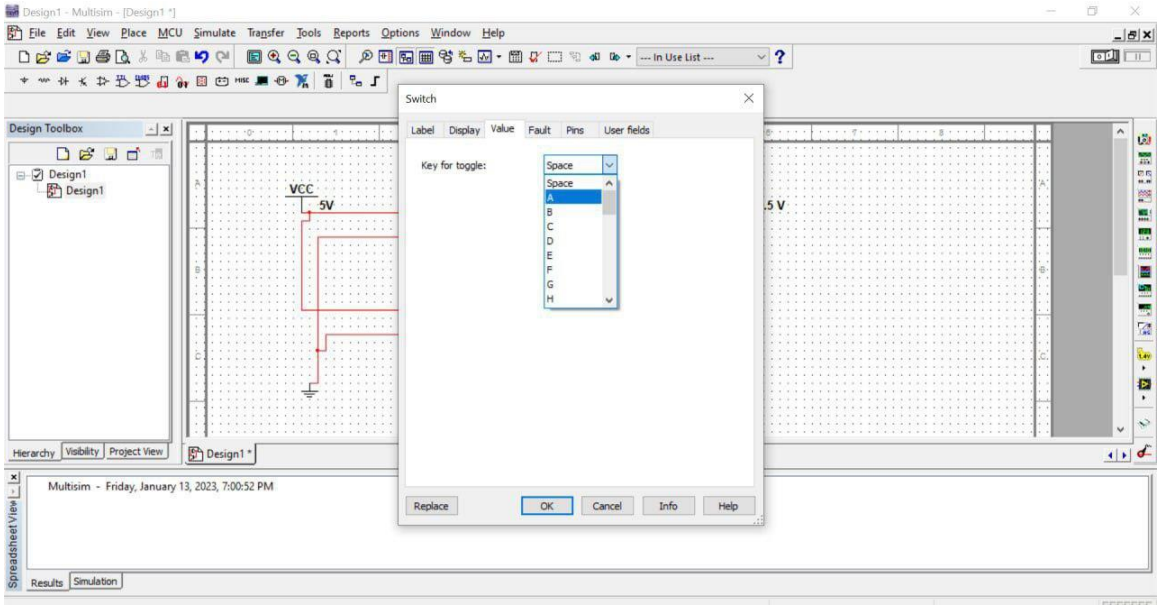
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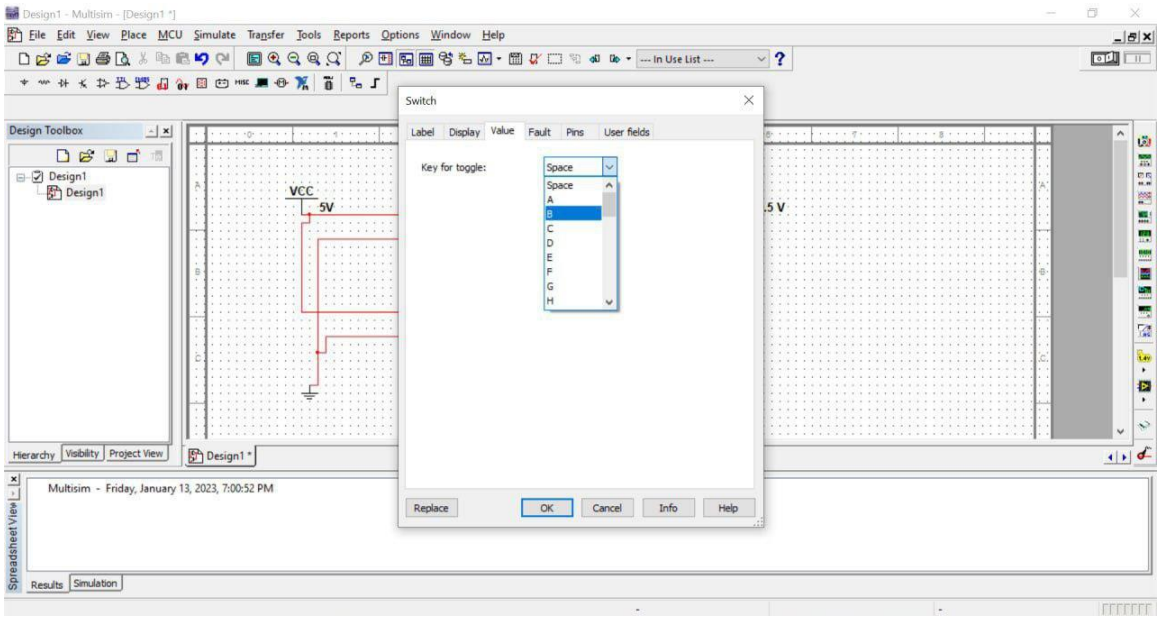
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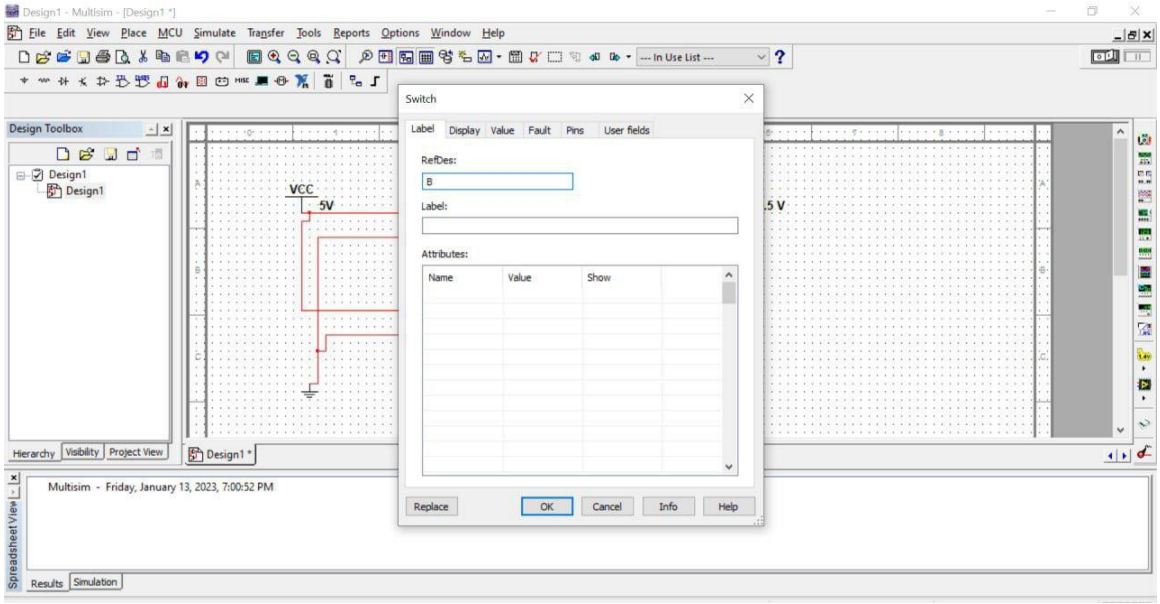
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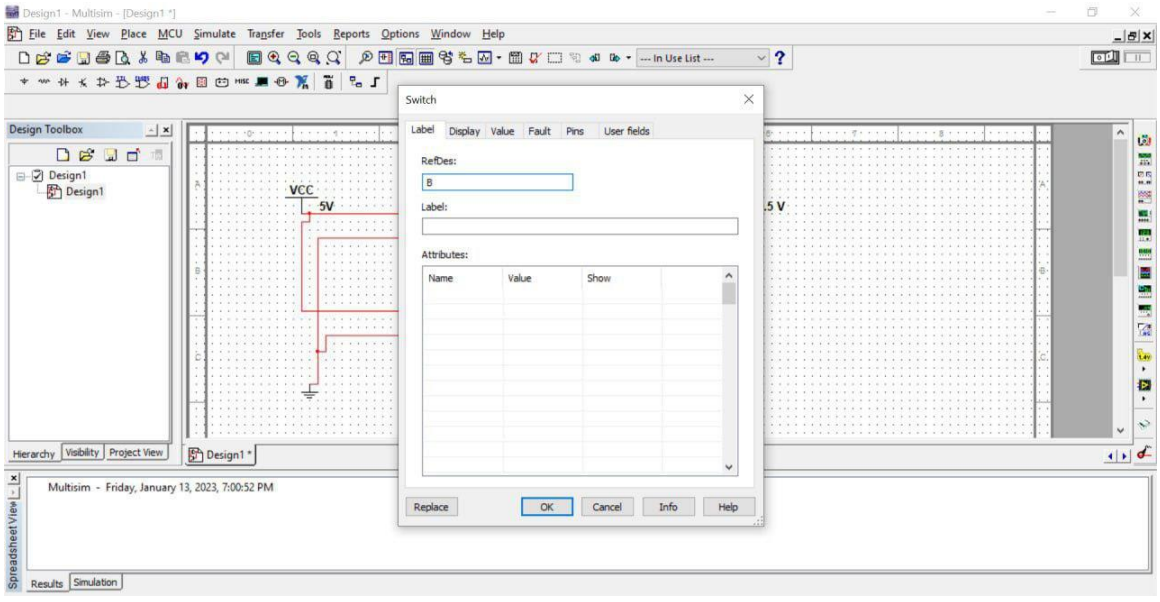
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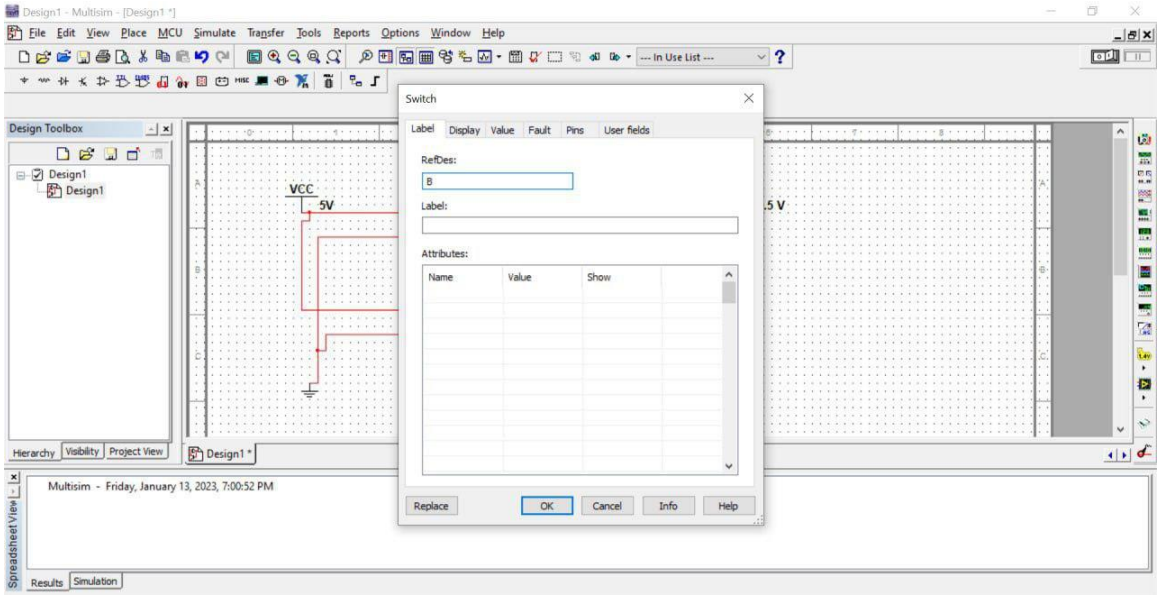
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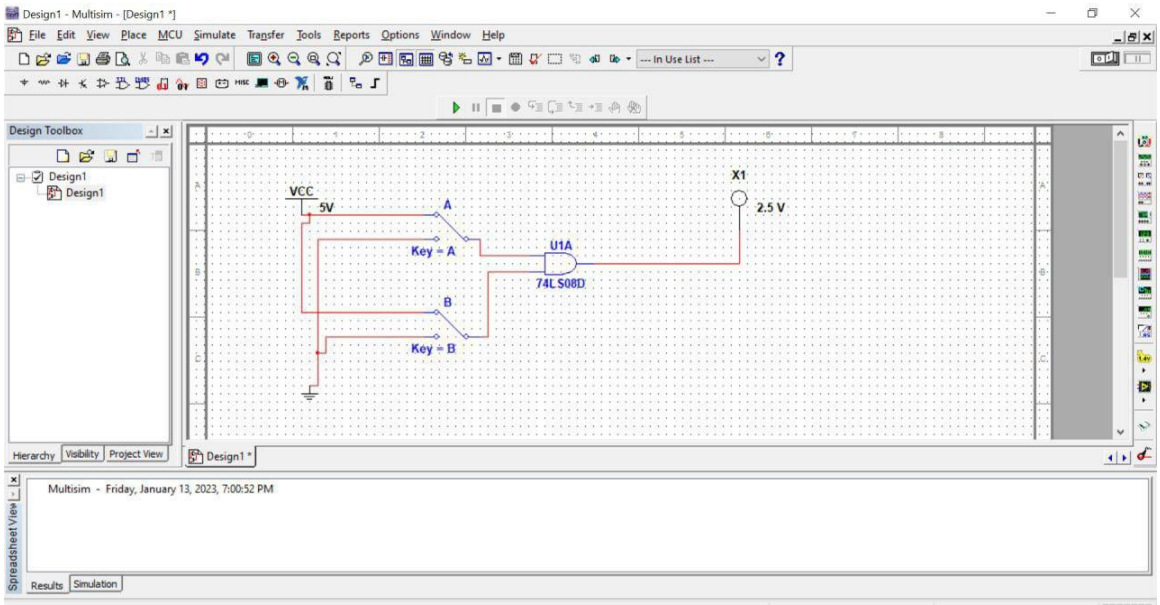
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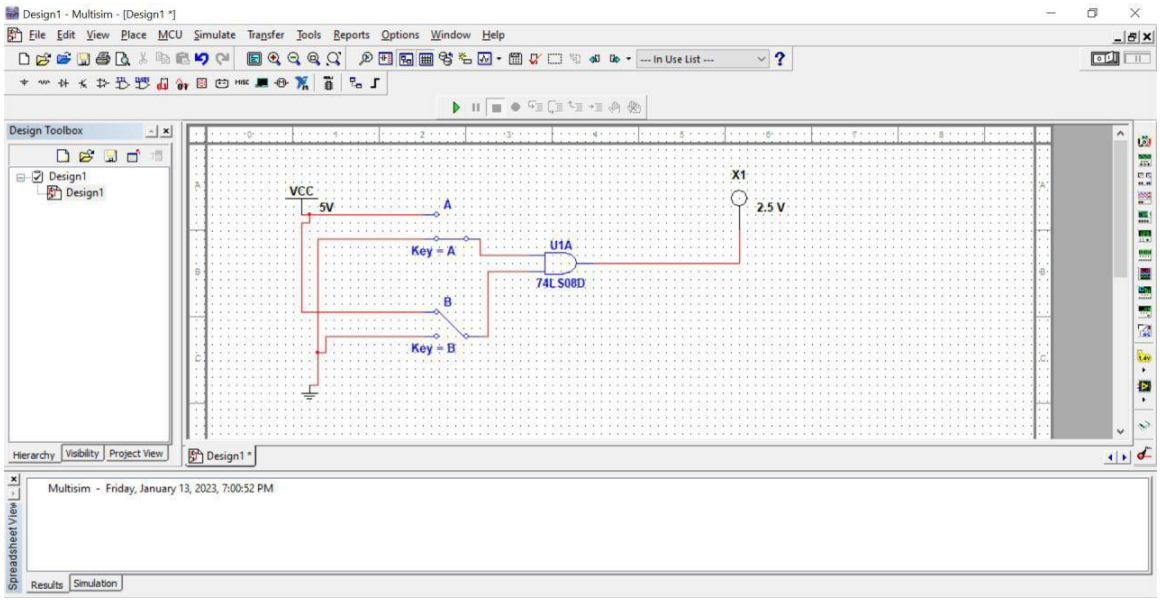
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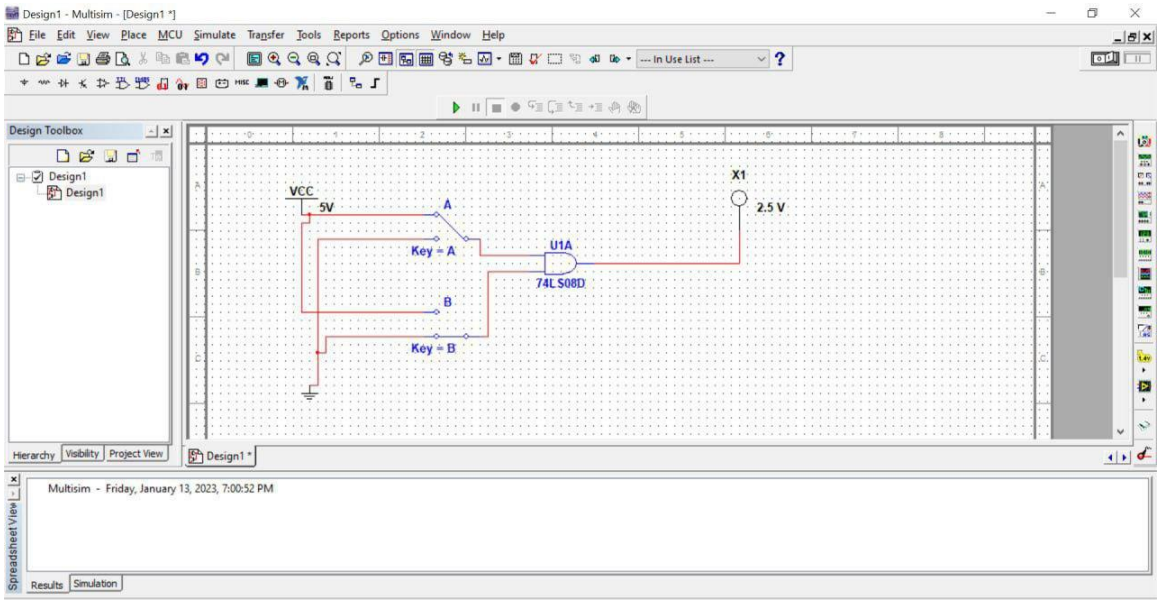

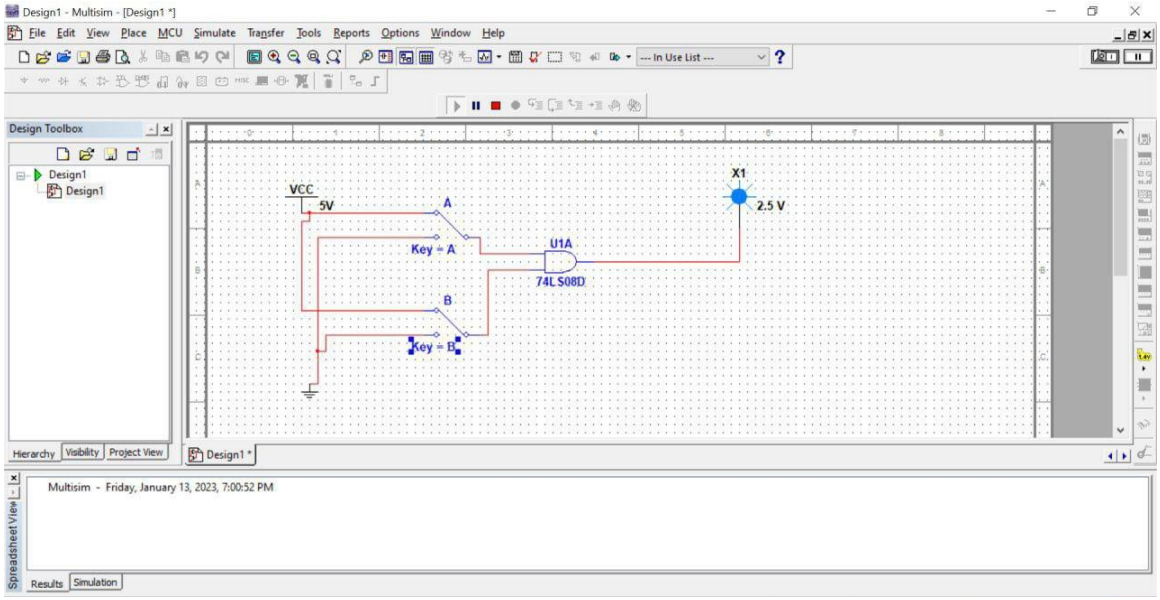

Discussion：

1.Design and Give the truth table for OR gate ？

2.Why NAND & NOR gates are called universal gates?

3.Give the truth table for EX-NOR and realize using NAND gate?