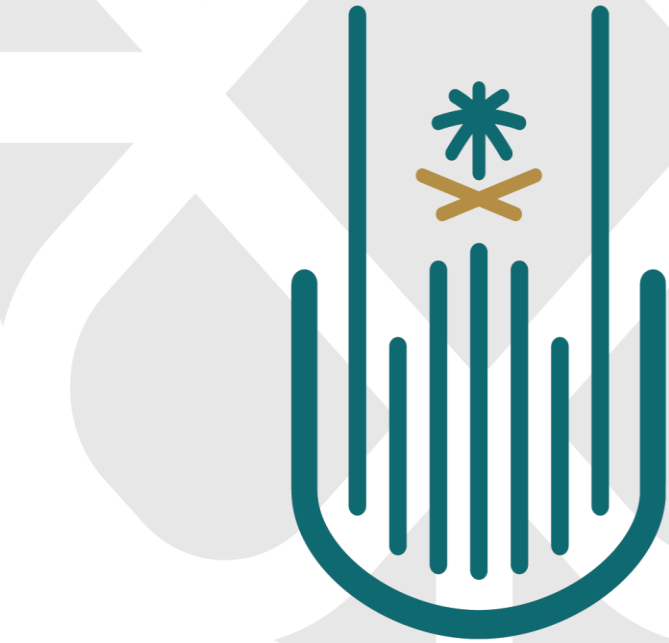

جامعة أم القرى
UMM AL-QURA UNIVERSITY

Subject Name: **Hardware and Software Interface**
Group Name: Computers 1
Section: 6

Group Members:

NAME	ID
Reham Fidh Allah Khan	**445013974**
Wasan Salman Alharbi	**44510121**
Retaj Hussain Alhazmi	**445006594**
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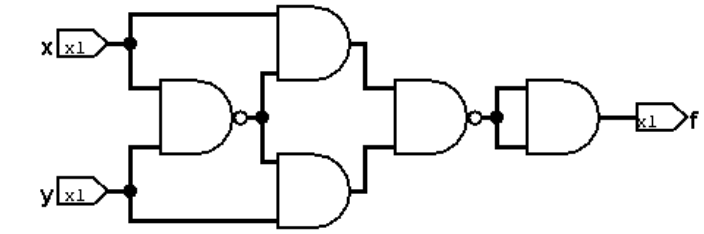
Mariam Naif Alzahrani	**445006579**

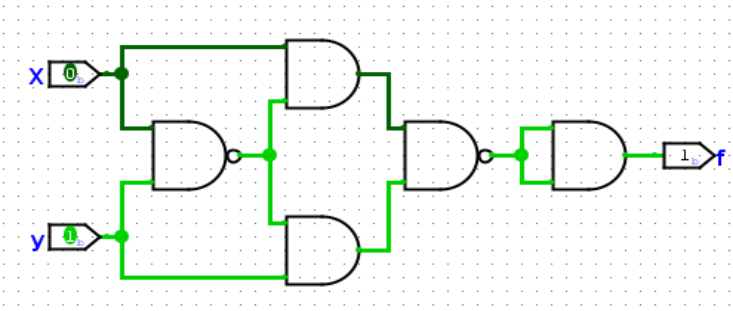
Dr. Anas Daghistani

Computer Group 1

The first part is about logical digital design

T1. CONSTRUCT THE FOLLOWING LOGIC CIRCUIT USING LOGISIM EVOLUTION.





T2. Fill in the truth table for the same logic circuit.

x	*y*	*F*
0	0	1
0	1	1
1	0	1
1	1	1

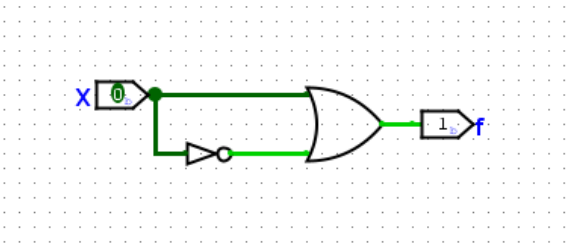
T3. Write the Boolean algebraic expression for the same logic circuit.

SOP Minterm f =$\bar{A}\bar{B}+\bar{A}B+A\bar{B}+AB$

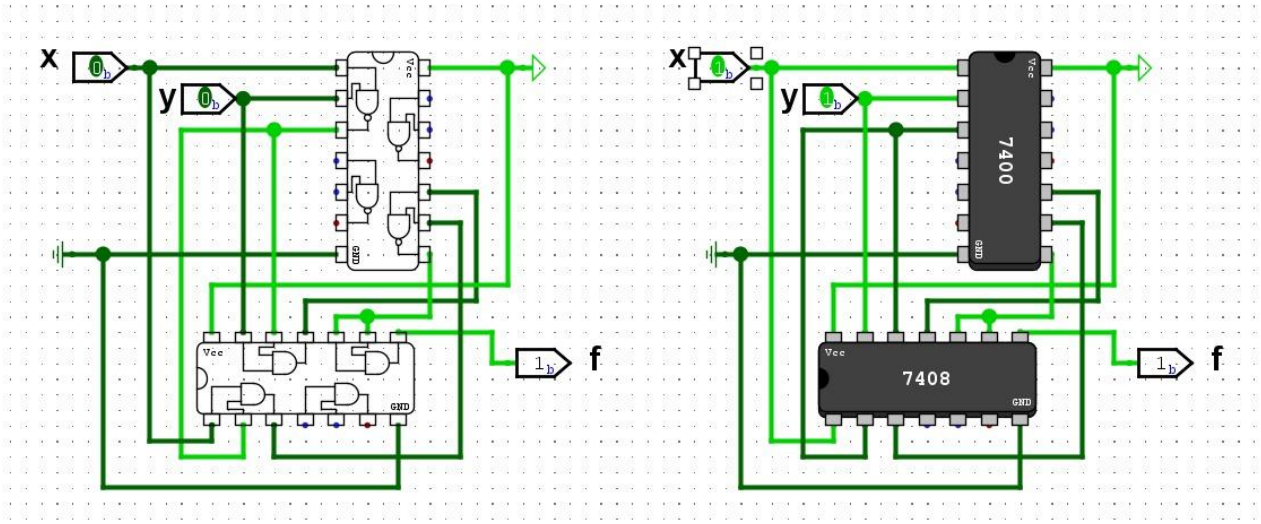
T4. Minimize the circuit in T1 to the simplest possible form; then, draw the final result.

The Final Simplification Form :

$$\bar{A}\bar{B}+\bar{A}B+A\bar{B}+AB$$
$$\bar{X}(\bar{Y}+Y)+X(\bar{Y}+Y)$$
$$\bar{X}\,(1)+X(1)$$
$$\bar{X}+X$$



T5. BONUS: CHOOSE THE REQUIRED EQUIPMENT AND WRITE THEIR QUANTITIES TO CONSTRUCT THE DESIGN ABOVE IN T1 USING THE TTL CHIPS IN LOGISIM EVOLUTION.	
Quantity	*Equipment*
2	PIN_IN
1	7400 TTL Chip
1	7408 TTL Chip
1	PIN_OUT, VCC, GND
7400, 7402, 7404, 7408, 7432, 7436, 7486, 747266, PIN_IN, PIN_OUT, VCC, GND	



The second part is about the organization and architecture of the computer

Group 1 (Laptops) Comparison

الاسم الثلاثي بالعربي	ريهام فيض الله خان	رتاج حسين الحازمي	ماريا ممدوح الزهيري	وسن سلمان الحربي	مريم نايف الزهراني
الرقم الجامعي	445013974	445006594	445006784	44510121	445006579
Test Link	Test Link	Test Link	Test Link	Test Link	Test link
Single-Core Score	1609	1260	1289	1327	2482
Multi-Core Score	3798	3798	4328	5701	7997
ISA *(Not in Geek)*	X86-64(Intel64)	X64-based PC	x64	x64	X86-64
User	rfkhan	Rhhazmi	mmalzuhery	wsalharbi	mnalzahrani
Upload Date	January 13 2025 07:47 AM	January 13 2025 07:50 AM	January 18 2025 10:36 AM	January 13 2025 8:00AM	January 24 2025 01:53 PM
Operating System	Microsoft Windows 11 Pro (64-bit)	Microsoft Windows 11 Home (64-bit)	Microsoft Windows 11 Home (64-bit)	Microsoft Windows 11 Home (64-bit)	Microsoft Windows 11 Home (64-bit)
Model	HP Laptop 14s dq2xxx	HUAWEI NBLB-WAX9N	HUAWEI BoDE-WXX9	ASUSTek COM-PUTER INC. V VivoBook_ASUS	LENOVO 82Y0
Motherboard	HP 87FD	HUAWEI NBLB-WAX9N-PCB-B2	HUAWEI BoDE-WXX9-PCB-B4	ASUSTek TP3402VA	LENOVO LNVNB161216
Processor Name	Intel Core i7-1165G7	Intel Core i5-10210U	Intel Core i7-1195G7	Intel Core i9-13900H	Intel Core i7-1355U
Topology	1 Processor, 4 Cores, 8 Threads	1 Processor, 4 Cores, 8 Threads	1 Processor, 4 Cores, 8 Threads	1 Processor,14 Cores,20 Threads	1 Processor, 10 Cores, 12 Threads
Base Frequency	2.80 GHz	2.09 GHz	2.89GHz	2.60 GHz	1.70 GHz
Codename	Tiger Lake-U	Comet Lake-U/Y	Tiger Lake-U	Raptor Lake	Raptor Lake
Max Frequency	4695 MHz	4189 MHz	4990 MHz	5187 MHz	4959 MHz
L1 (I Cache, Data Cache, or both?)	Instruction Cache 32.0 KB x 4	Both 32.0 KB x 4	Instruction Cache 32.0KBx4	Instruction Cache 32KBx10	Instruction Cache: 32.0 KBx6
L1 (I Cache, Data Cache, or both?)	Data Cache 48.0 KB x 4	Both 32.0 KB x 4	Data Cache 48.0 KB x 4	Data Cache 48KBx10	Data Cache: 48.0 KB x 6
L2 (if available)	1.25 MB x 4	256 KB x 4	1.25 MB x 4	1.25 MB x2	1.25 MB x 1
L3 (if available)	12.0 MB x 1	6.00 MB x 1	12.0 MB x 1	24MBx1	12.0 MB x 1
Memory Size	16.00 GB	7.84 GB	15.79 GB	15.62GB	15.55 GB
Frequency	1064 MHz	1196 MHz	3200 MHz	1064MHz	1600 MHz
Type	DDR4 SDRAM	DDR4 SDRAM	DDR4 SDRAM	DDR4SDRAM	DDR4 SDRAM

Channels	2	2	4	2	4
1- Single-Core Benchmark (File Compression)	1579 226.8 MB/sec	1190 170.9 MB/sec	1341 192.6 MB/sec	1288 185.0 MB/sec	2482 356.8 MB/sec
2- Single-Core Benchmark (PDF Renderer)	1730 39.9 Mpixels/sec	1353 31.2 Mpixels/sec	1395 32.2 Mpixels/sec	1300 30.0 Mpixels/sec	2031 47.3 Mpixels/sec
1- Multi-Core Benchmark (File Compression)	4063 583.6 MB/sec	1886 270.9 MB/sec	3960 568.7 MB/sec	3445 494.8 MB/sec	7997 1147.2 MB/sec
2- Multi-Core Benchmark (PDF Renderer)	6354 146.5 Mpixels/sec	4837 111.5 Mpixels/sec	4864 112.2 Mpixels/sec	7396 170.6 Mpixels/sec	9654 222.9 Mpixels/sec

Based on the comparisons above, in your own words, which (Laptop) do you think is the best? Why?

The best laptop for studying, according to the previous table, is (Lenovo 82Y0 (Maryam)) for the following reasons :

It achieved the highest scores in both single-core (2482) and multi-core (7997) tests, indicating strong processing power and efficiency, making it suitable for multi taskin. Powered by an (Intel Core i7-1355U) processor with a base frequency of (1.70GHz), ensuring fast and smooth performance in study-related applications like word processing, research, and educational tool.

Additionally, Lenovo (Maryam) achieved good scores in file compression tests (2482) and PDF tests (2031) for Single-Core Benchmark , and also performed well in multi-core Benchmark with high scores in file compression (7997) and PDF (9654), which reflects its high efficiency in multi tasking.

Based on these results, Lenovo (Maryam) is the ideal choice for studying due to its high efficiency in multi tasking, fast data processing, and ability to handle study applications that require high processing power, making it a powerful and versatile device suitable for students needing excellent performance.

based on facts and benchmarks results?

The best laptop based of facts and benchmarks results is Mariam's laptop. Her laptop scored the highest points in the single core benchmark (file compression and PDF Renderer) and in the multi core benchmark (file compression and PDF Renderer).

What did you learn from this project?

We learned time management, teamwork with a new team, computer components, logic gates, and electrical circuits.

What would you do differently next time? (Future work)

Compare our family's computers, create my own circuits.

What is your advice to someone who will work on the same project in the future?

Beginning early, working on it consistently, and organizing tasks with clarity.

What did you dislike about this project?

Nothing. Everything was great.