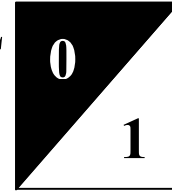**ISTANBUL TECHNICAL UNIVERSITY**

COMPUTER ENGINEERING

DIGITAL CIRCUITS LABORATORY EXPERIMENT REPORT

EXPERIMENT NO: 1

EXPERIMENT NAME: Boolean Algebra

EXPERIMENT DATE: 24.02.2014

GROUP NO: A6

STUDENTS WHO DID THE EXPERIMENT:

Student no	Name	Surname
150110040	Çağatay	Erdiz
150110018	Alper	Kocabıyık
150110023	Emre Can	Agatay

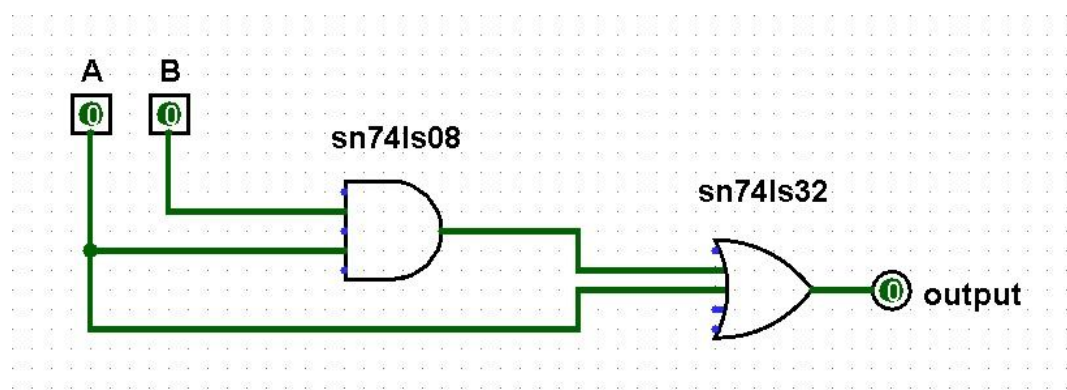## ASSISTANT NAME WHO ASSISTED THE EXPERIMENT: Hasan Ünlü

A) INTRODUCTION

The aim of this experiment is examining the axioms and theorems of Boolean algebra in an experimental environment.
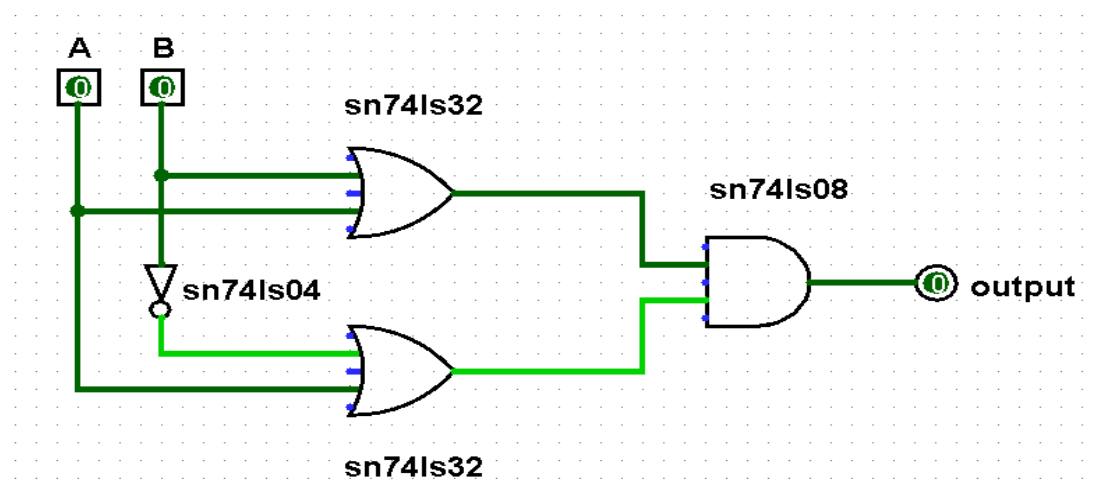
B) EXPERIMENTS

#1.1:

a) A+A.B = A

A	B	A.B	A+A.B
0	0	0	0
0	1	0	0
1	0	0	1
1	1	1	1

b) (A+B)*(A+B') = A

A	B	B'	A+B	A+B'	(A+B).(A+B')
0	0	1	0	1	0
0	1	0	1	0	0
1	0	1	1	1	1
1	1	0	1	1	1

#1.2:

The duality of **A+A.B=A** is **A.(A+B)=A**
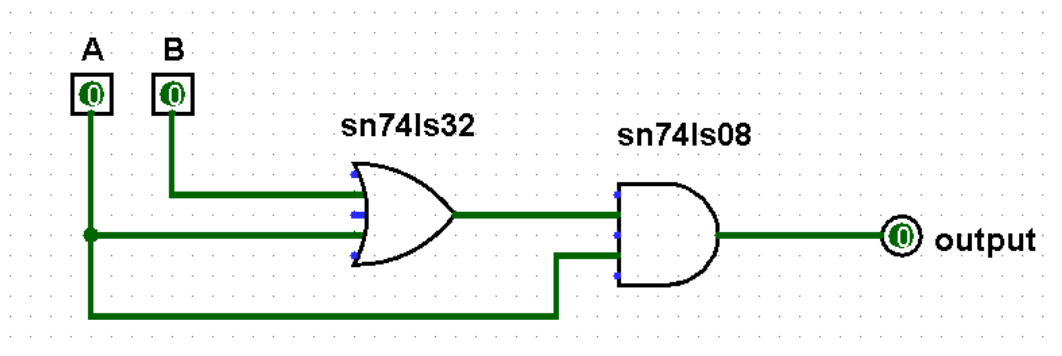
A	B	A+B	A.(A+B)
0	0	0	0
0	1	1	0
1	0	1	1
1	1	1	1

#1.3:

F = X + Y.Z

F' = X'.(Y'+Z')
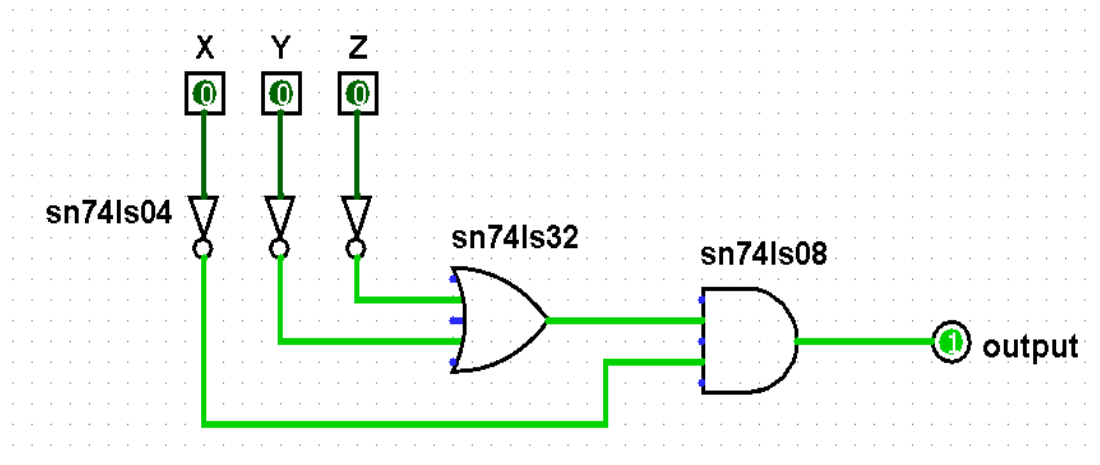
F :

X	Y	Z	Y.Z	F
0	0	0	0	0
0	0	1	0	0
0	1	0	0	0
0	1	1	1	1
1	0	0	0	1
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

F' :

X'	Y'	Z'	Y'+Z'	F'
1	1	1	1	1
1	1	0	1	1
1	0	1	1	1
1	0	0	0	0
0	1	1	1	0
0	1	0	1	0
0	0	1	1	0
0	0	0	0	0

#1.4:

F(A,B,C) = B.C' + D'
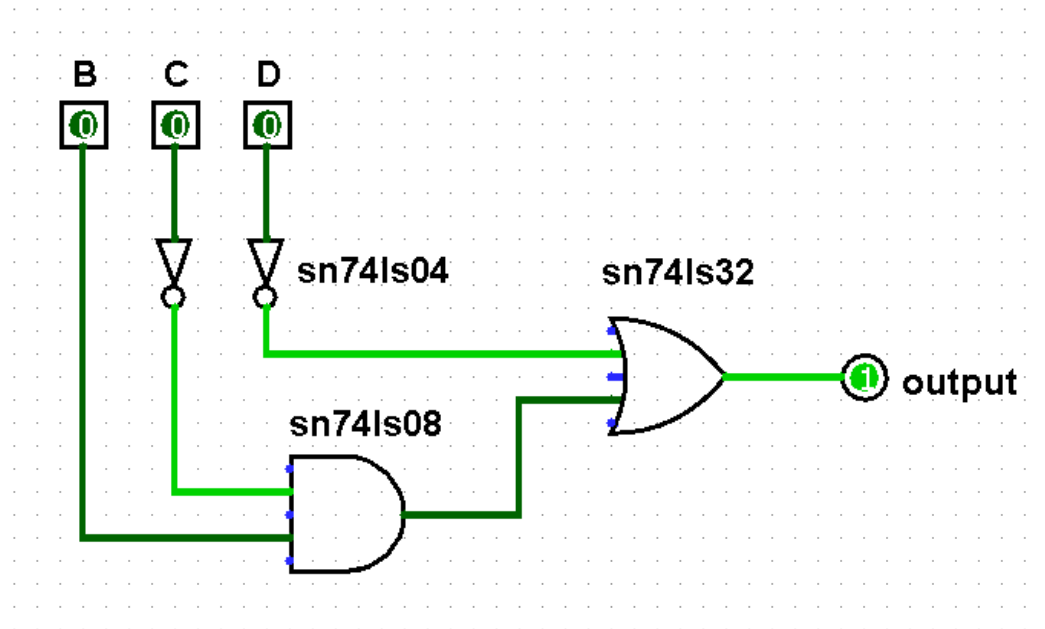
B	C	D	C'	D'	B.C'	B.C' + D'
0	0	0	1	1	0	1
0	0	1	1	0	0	0
0	1	0	0	1	0	1
0	1	1	0	0	0	0
1	0	0	1	1	1	1
1	0	1	1	0	1	1
1	1	0	0	1	0	1
1	1	1	0	0	0	0

C) QUESTİONS

The error is the incorrect use of the operator precedence.
"." has more precedence than "+". Correct version of the
function:

F' = (A+B.C+D)'
F' = A'.(B'+C').D'
F' = A'.B'.D'+A'.C'.D'

5