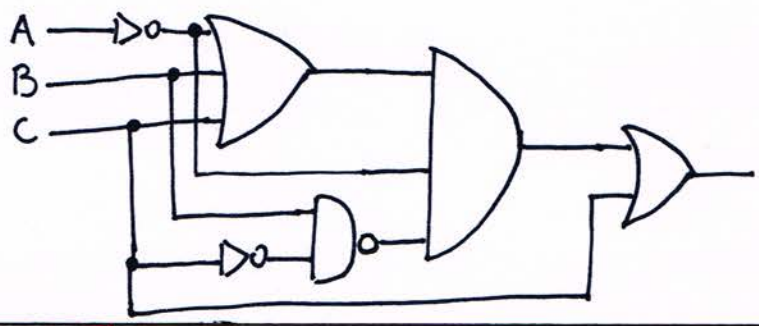
ESERCIZI DI PREPARAZIONE AL COMPITO

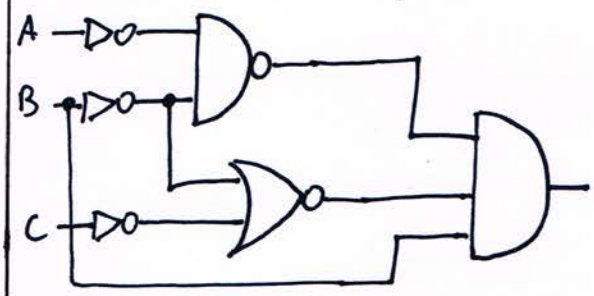
PARTE 1: ANALISI DEI CIRCUITI COMBINATORI

DATO IL SEGUENTE CIRCUITO, DETERMINARE LE ESPRESSIONI LOGICHE IN USCITA A CIASCUNA PORTA LOGICA E LA RELATIVA TABELLA DI VERITÁ.

ESERCIZIO 1.1



ESERCIZIO 1.2



PARTE 2: PROGETTAZIONE DEI CIRCUITI COMBINATORI IN PRIMA FORMA CANONICA

DATA LA SEGUENTE TABELLA DI VERITÁ, DETERMINARE LA RELATIVA ESPRESSIONE ALGEBRICA IN PRIMA FORMA CANONICA E DISEGNARE IL CIRCUITO RISULTANTE SEGUENDO LO SCHEMA "PAL" (PROGRAMMABLE ARRAY LOGIC).

ESERCIZIO 2.1

A	B	C	U
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

ESERCIZIO 2.2

A	B	C	U
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

ESERCIZIO 2.3

A	B	C	U
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

PARTE 3: SEMPLIFICAZIONE DELLE ESPRESSIONI LOGICHE MEDIANTE MAPPE DI KARNAUGH

DATA LA SEGUENTE ESPRESSIONE LOGICA, ATTUARE LA SEMPLIFICAZIONE MEDIANTE MAPPA DI KARNAUGH, SCRIVERE L'ESPRESSIONE LOGICA SEMPLIFICATA E DISEGNARE IL CIRCUITO RISULTANTE.

ESERCIZIO 3.1

$$U = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}BC + A\bar{B}\bar{C} + ABC$$

ESERCIZIO 3.2

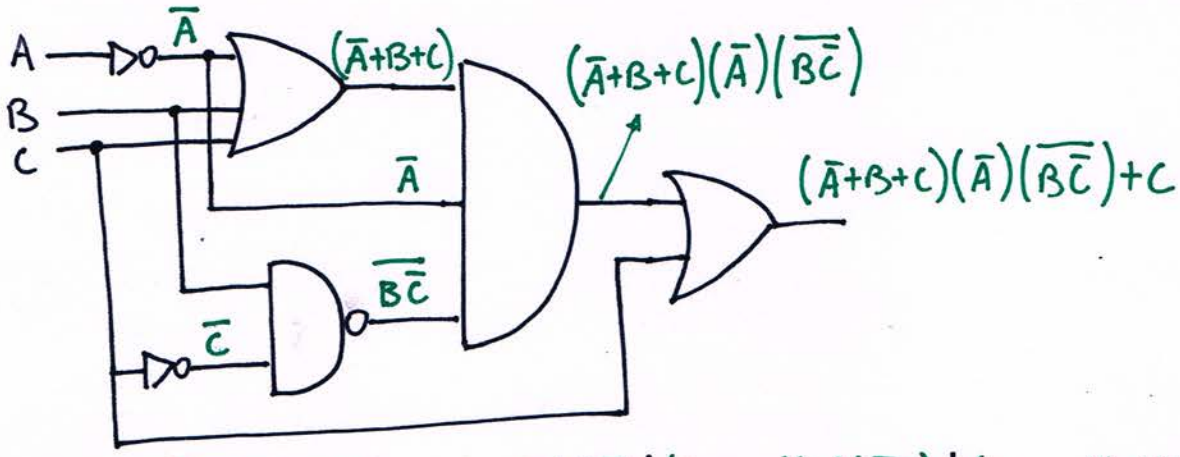
$$U = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D} + A\bar{B}\bar{C}D + AB\bar{C}\bar{D} + AB\bar{C}D + \bar{A}B\bar{C}\bar{D} + \bar{A}B\bar{C}D + A\bar{B}C\bar{D} + \bar{A}\bar{B}C\bar{D} + A\bar{B}CD$$

ESERCIZIO 3.3

$$U = \bar{A}\bar{B}\bar{C}\bar{D} + AB\bar{C}\bar{D} + A\bar{B}\bar{C}\bar{D} + \bar{A}B\bar{C}\bar{D} + ABC\bar{D} + A\bar{B}C\bar{D} + \bar{A}BC\bar{D} + \bar{A}\bar{B}C\bar{D} + AB\bar{C}D + ABCD + \bar{A}BCD$$

SVOLGIMENTO DI ALCUNI DEGLI ESERCIZI

ESERCIZIO 1.1

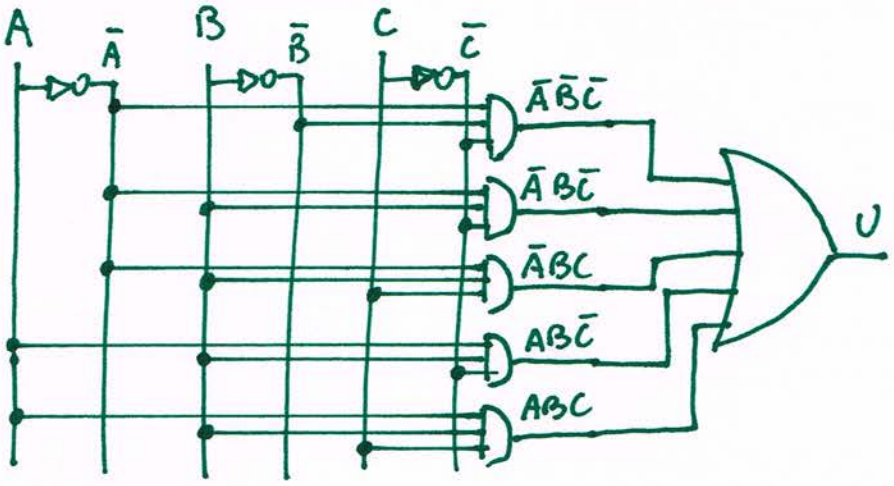


A	B	C	$\bar{A}$	$\bar{C}$	$\bar{A}+B+C$	$B\bar{C}$	$\overline{B\bar{C}}$	$(\bar{A}+B+C)(\bar{A})(\overline{B\bar{C}})$	$(\bar{A}+B+C)(\bar{A})(\overline{B\bar{C}})+C$
0	0	0	1	1	1	0	1	1	1
0	0	1	1	0	1	0	1	1	1
0	1	0	1	1	1	1	0	0	0
0	1	1	1	0	1	0	1	1	1
1	0	0	0	1	0	0	1	0	0
1	0	1	0	0	1	0	1	0	1
1	1	0	0	1	1	1	0	0	0
1	1	1	0	0	1	0	1	0	1

ESERCIZIO 2.1

A	B	C	U	
0	0	0	1	$\bar{A}\bar{B}\bar{C}$
0	0	1	0	
0	1	0	1	$\bar{A}B\bar{C}$
0	1	1	1	$\bar{A}BC$
1	0	0	0	
1	0	1	0	
1	1	0	1	$AB\bar{C}$
1	1	1	1	ABC

$$U = \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}BC + AB\bar{C} + ABC$$



ESERCIZIO 3.1

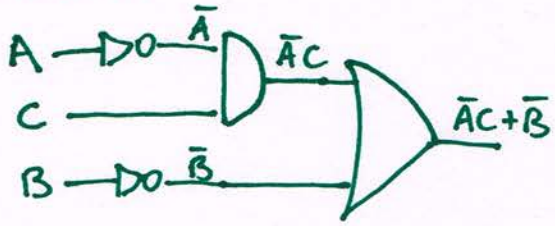
$U = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}BC + A\bar{B}\bar{C} + A\bar{B}C$

	$\bar{A}\bar{B}$ 00	$\bar{A}B$ 01	AB 11	$A\bar{B}$ 10
$\bar{C}$ 0	1	0	0	1
C 1	1	1	0	1

$\bar{B}$ $\quad$ $\bar{A}C$

$$U = \bar{A}C + \bar{B}$$

CIRCUITO:



ESERCIZIO 3.2

$U = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D} +$
$+ A\bar{B}\bar{C}D + AB\bar{C}\bar{D} + AB\bar{C}D +$
$+ \bar{A}B\bar{C}\bar{D} + \bar{A}B\bar{C}D + A\bar{B}CD +$
$+ \bar{A}\bar{B}C\bar{D} + A\bar{B}C\bar{D}$

	$\bar{A}\bar{B}$ 00	$\bar{A}B$ 01	AB 11	$A\bar{B}$ 10
$\bar{C}\bar{D}$ 00	1	1	1	1
$\bar{C}D$ 01	1	1	1	1
CD 11	0	0	0	1
$C\bar{D}$ 10	1	0	0	1

$\bar{C}$ $\quad$ $A\bar{B}$ $\quad$ (I QUATTRO ANGOLI) $\quad$ $\bar{B}\bar{D}$

$$U = \bar{C} + A\bar{B} + \bar{B}\bar{D}$$

CIRCUITO: