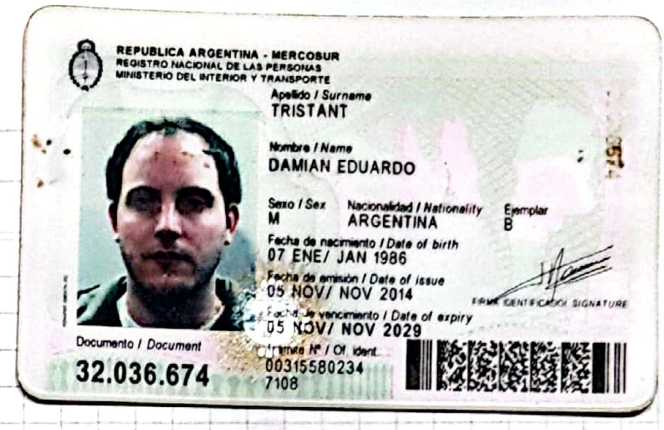
TP INTEGRADOR 3

1. LOGICA PROSICIONAL



ULTIMOS 3 DIGITOS DNI = abc

674 = abc

1)

P: ABC ES MULTIPLO DE 2 $\Rightarrow$ V

Q: ABC MOD 5 = 0 $\Rightarrow$ F

R: ABC > 500 $\Rightarrow$ V

2) $F_1 = (\neg P \wedge Q) \vee R$

$(F \wedge F) \vee V$

$F \vee V$

$F_1 = V$

$F_2 = (P \rightarrow \neg R) \wedge (Q \vee R)$

$(V \rightarrow F) \wedge (F \vee V)$

$F \wedge V$

$F_2 = F$

3)

P	Q	R	$\neg P$	$\neg P \wedge Q$	$F_1 = (\neg P \wedge Q) \vee R$
V	V	V	F	F	V
V	V	F	F	F	F
V	F	V	F	F	V
V	F	F	F	F	F
F	V	V	V	V	V
F	V	F	V	V	V
F	F	V	V	F	V
F	F	F	V	F	F

P	Q	R	$\neg R$	$P \rightarrow \neg R$	$Q \vee R$	$F_2 (P \rightarrow \neg R) \wedge (Q \vee R)$
V	V	V	F	F	V	F
V	V	F	V	V	V	V
V	F	V	F	F	V	F
V	F	F	V	V	F	F
F	V	V	F	V	V	V
F	V	F	V	V	V	V
F	F	V	F	V	V	V
F	F	F	V	V	F	F

$F_1 = (\neg P \wedge Q) \vee R = (\neg P \vee R) \wedge (Q \vee R)$

$F_2 = (P \rightarrow \neg R) \wedge (Q \vee R) = (\neg P \vee \neg R) \wedge (Q \vee R)$

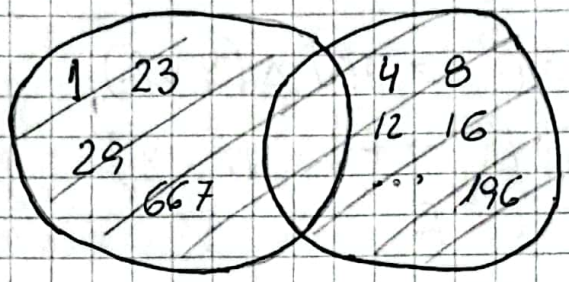
2. Teoría Conjuntos.

1) $wxyz = 6674$

$A = \{1, 2, 3, 29, 667\}$

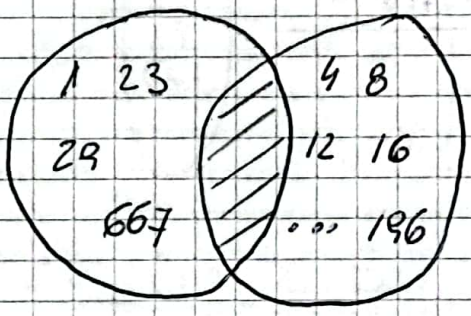
$B = \{4, 8, 12, 16, \ldots, 196\}$

2) $A \cup B =$



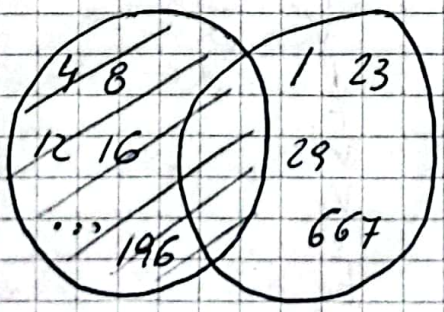
$A \cup B = \{x / x \in A \vee x \in B\}$

$A \cap B =$



$A \cap B = \{x / x \in A \wedge x \in B\}$

$B - A =$



$B - A = \{x / x \in B \wedge x \in A\}$

3) $A \cap B = \emptyset$

$A \cup B = \{1, 4, 8, 12, 16, \ldots, 196, 23, 29, 667\}$

$B - A = \{4, 8, 12, 16, \ldots, 196\}$

EN ESTE CASO TANTO A COMO B NO COMPARTEN NINGUN ELEMENTO ASI QUE

$A \not\subset B \wedge B \not\subset A$

3. RELACIONES Y FUNCIONES

1) $A = \{1, 23, 29, 667\}$

$B = \{4, 8, 12, 16, 20, \ldots, 196\}$

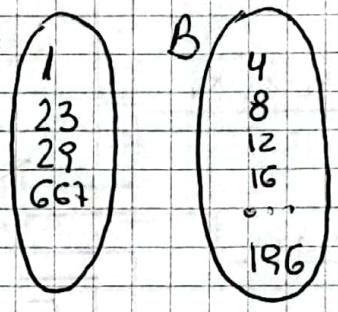
$(a, b) \in R$ si, y solo si $b = a + z$

$z = 4$

$a = 1 + 4 = 5 \rightarrow$ No esta en B
$a = 23 + 4 = 27 \rightarrow$ No
$a = 29 + 4 = 33 \rightarrow$ No
$a = 667 + 4 = 671 \rightarrow$ No

No se cumple, entonces $R = \emptyset$

$R =$



- Dominio = $\emptyset$
- Codominio = $\{4, 8, 12, \ldots 196\}$
- Rango = $\emptyset$
- Es función = No, porque no asigna ningun valor
- Es inyectiva = Si, porque no hay 2 con la misma imagen
- Es sobreyectiva = No porque ningun elemento de B es imagen

4. ALGEBRA DE BOOLE.

1) $wxyz = 6674$

$w = 6 \rightarrow x_1 = 1$
$x = 6 \rightarrow x_2 = 1$
$y = 7 \rightarrow x_3 = 0$
$z = 4 \rightarrow x_4 = 1$

$(x_1, x_2, x_3, x_4) = 1101$

$F(x_1, x_2, x_3, x_4) = 1$
Si $2x_i = 1$

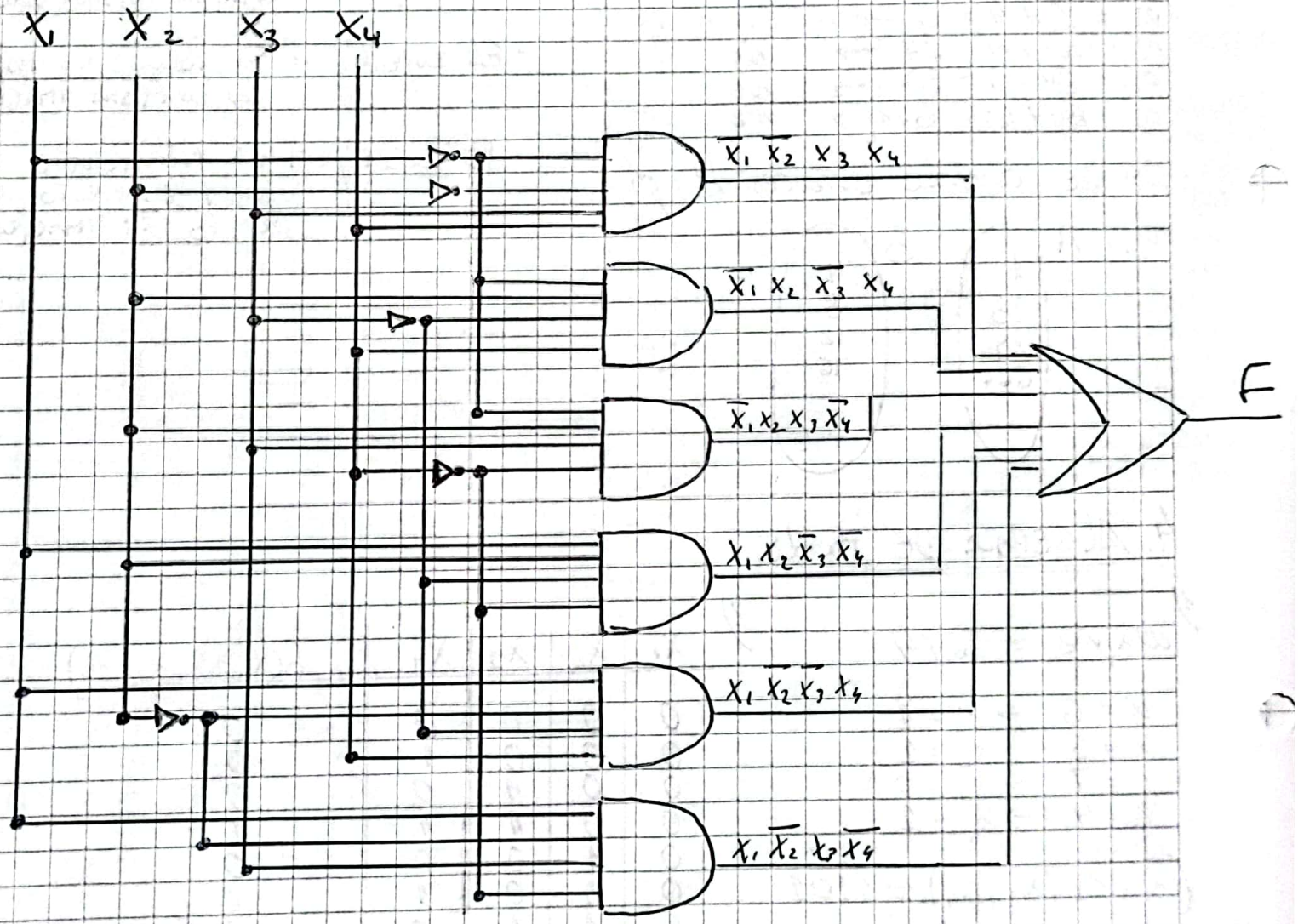
2)

x_1	x_2	x_3	x_4	$F(x_1, x_2, x_3, x_4)$
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1 -
0	1	0	0	0
0	1	0	1	1 -
0	1	1	0	1 -
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1 -
1	0	1	0	1 -
1	0	1	1	0
1	1	0	0	1 -
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

2)

X_1 X_2 \ X_3 X_4	00	01	11	10
00	0	0	1	0
01	0	1	0	1
11	1	0	0	0
10	0	1	0	1

$$F = \bar{X}_1\bar{X}_2X_3X_4 + \bar{X}_1X_2\bar{X}_3X_4 + \bar{X}_1X_2X_3\bar{X}_4 + X_1X_2\bar{X}_3\bar{X}_4 + X_1\bar{X}_2\bar{X}_3X_4 + X_1\bar{X}_2X_3\bar{X}_4$$



5. Teoría de Grafo.

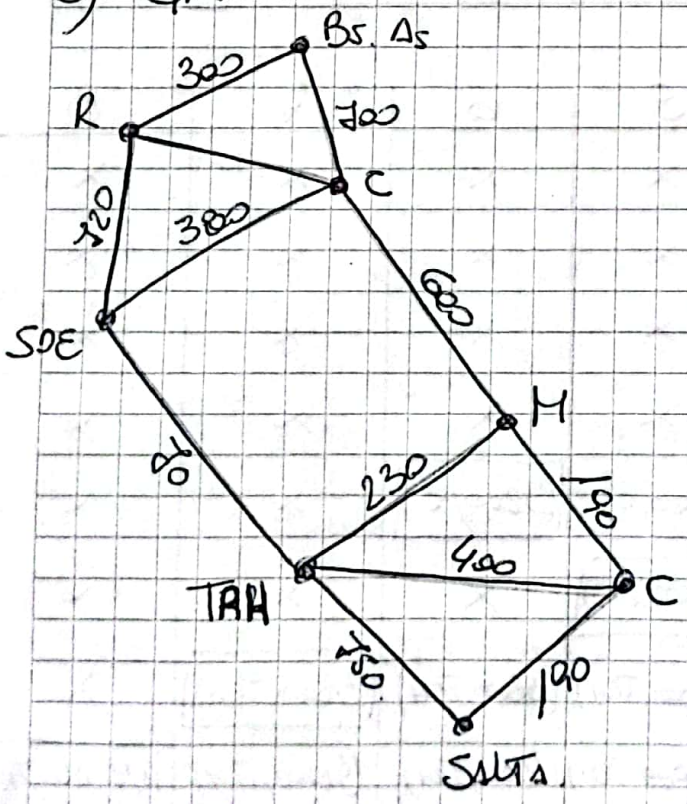
- Considerando Bs. As hasta Salta.

1)
1. Bs. As.
2. Rosario
3. Córdoba
4. Santiago del Estero.
5. Tercus Río Hondo
6. Metán
7. Cafayate
8. Salta.

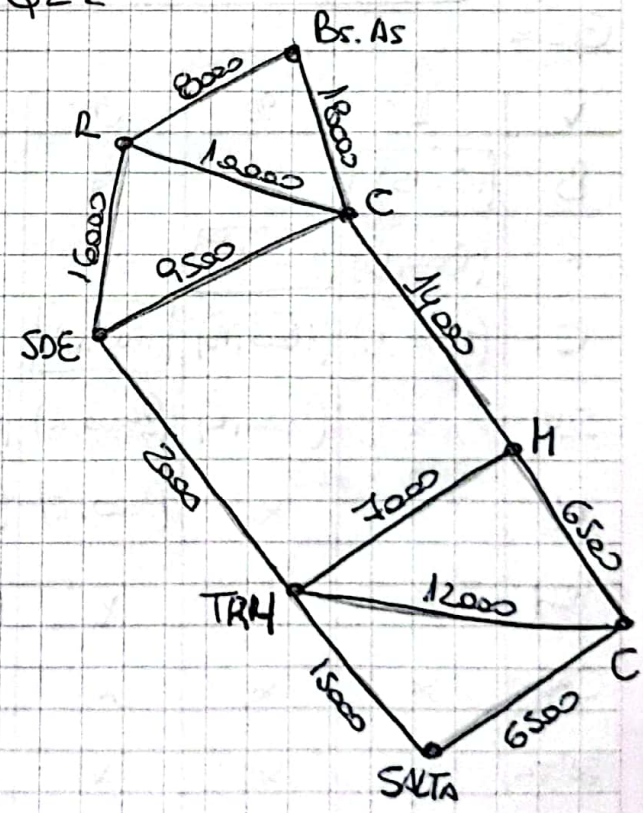
2)

G1 = Vértices			Aristas (km)	G2 =	Aristas (Precios $)
Bs. As.	→	Rosario	300		8000
Bs. As.	→	Córdoba	700		18000
Rosario	→	Córdoba	400		10000
Rosario	→	SDE	720		16000.
Córdoba	→	SDE	380		9500
Córdoba	→	Metán	600		14000
SDE	→	TRH	70		2000
TRH	→	Metán	230		7000
TRH	→	Cafayate	400		12000
Metán	→	Cafayate	190		6500
TRH	→	Salta	750.		15000.
Cafayate	→	Salta	190.		6500

3) G1 =



G2 =



3) AMBOS GRAFOS SON CONEXOS.

GRADO MEDIO: $G_1 = 3$, $G_2 = 3$

G_1 =

VERTICE	PASO 1	2	3	4	5	6	7	8
Bs.As	(0, B)	x	x	x	x	x	x	x
R	(300, B)	(300, B)	x	x	x	x	x	x
C	(700, B)	(700, B)	(700, B)	x	x	x	x	x
SDE	x	(1020, R)	(1020, R)	(1020, R)	x	x	x	x
M	x	x	(1300, C)	(1300, C)	(1320, TRH)	(1320, TRH)	x	x
TRH	x	x	x	(1090, SDE)	(1090, SDE)	x	x	x
CAF	x	x	x	x	(1490, TRH)	(1490, TRH)	(1490, TRH)	x
SALTA	x	x	x	x	(1840, TRH)	(1840, TRH)	(1680, CAF)	(1680, CAF)

RUTA SEGUN DIJKSTRA TOTAL 1680 KM.

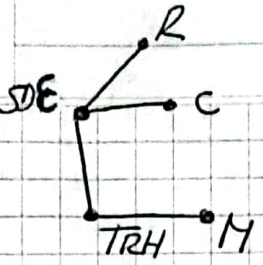
G_2 =

V	1	2	3	4	5	6	7	8
B	(0, B)	x	x	x	x	x	x	x
R	(8000, B)	(8000, B)	x	x	x	x	x	x
C	(18000, B)	(18000, B)	(18000, B)	x	x	x	x	x
SDE	x	(24000, R)	(24000, R)	(24000, R)	x	x	x	x
M	x	x	(32000, C)	(32000, C)	(32000, C)	(32000, C)	x	x
TRH	x	x	x	(26000, SDE)	(26000, SDE)	x	x	x
CAF	x	x	x	x	(38000, TRH)	(38000, TRH)	(38000, TRH)	x
SALTA	x	x	x	x	(41000, TRH)	(41000, TRH)	(41000, TRH)	(41000, TRH)

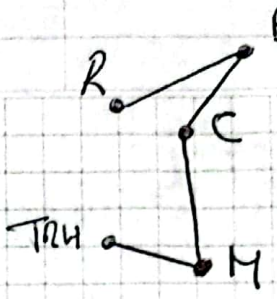
COSTO TOTAL SEGUN DIJKSTRA $41000.=

3)

SUBGRAFO G_1 =



SUBGRAFO G_2 =



6. MATRICES

DNI = 32036674
a b c d e f g 4

$$P = \begin{bmatrix} 32 & 03 & 66 \\ 74 & 32 & 03 \\ 66 & 74 & 32 \end{bmatrix} \quad g = \begin{bmatrix} 36 & 67 & 43 \\ 32 & 03 & 66 \\ 74 & 36 & 67 \end{bmatrix}$$

$P \times g =$	36 67 43
	32 03 66
	74 36 67

32	03	66	6132	4529	5996
74	32	03	3910	5162	5495
66	74	32	7112	5796	9866

1152 + 96 + 4884 = 6132
2664 + 1024 + 222 = 3910.
2376 + 2368 + 2368 = 7112

2144 + 9 + 2376 = 4529
4958 + 96 + 108 = 5162
4422 + 222 + 1152 = 5796.

1376 + 198 + 4422 = 5996
3182 + 2112 + 201 = 5495
2838 + 4884 + 2144 = 9866.

ULTIMO DIGITO(H) = 4

$$V = \begin{bmatrix} 144 & 268 & 172 \\ 128 & 12 & 264 \\ 296 & 144 & 268 \end{bmatrix}$$

$H' = P \times V$	144 268 172
	128 12 264
	296 144 268

32	03	66	24528	18116	23984
74	32	03	15640	20648	21980
66	74	32	28448	23184	39464

4608 + 384 + 19536 = 24528
10656 + 4096 + 888 = 15640
9504 + 9472 + 9472 = 28448

8576 + 36 + 9504 = 18116
19832 + 384 + 432 = 20648
17688 + 888 + 4608 = 23184

5504 + 792 + 17688 = 23984
12728 + 8448 + 804 = 21980
11352 + 19536 + 8576 = 39464

GASTO TOTAL ORIGINAL = 53998

GASTO TOTAL MODIFICADO = 215992

DIFERENCIA G' - G = 161994

"H" ES RECARGO

7. ARITMÉTICA BINARIA y AÑO NACIMIENTO

WXYZ = 6674 AÑO: 1986

1)

6674 |2
0 3374 |2
1 1668 |2
0 834 |2
0 417 |2
1 208 |2
0 104 |2
0 52 |2
0 26 |2
0 13 |2
1 6 |2
0 3 |2
1 1 |2
1 0/

WXYZ = 1101000010010

16 BITS = 0001101000010010.

2) AÑO: 1986

1986 |2
0 993 |2
1 496 |2
0 248 |2
0 124 |2
0 62 |2
0 31 |2
1 15 |2
1 7 |2
1 3 |2
1 1 |2
1 0/

16BITS = 0000011111000010

3)

0001101000010010
\- 0000011111000010

1111100000111101 CA1
\+ 1

1111100000111110 CA2

0001101000010010
\+ 1111100000111110

10001001000100010000

4) RESULTADOS EN TERMINOS DIFERENCIAS. DECIMAL

WXYZ = 6674
AÑO = 1986

4688.