

Práctico 6 - Dispersión: Se deberá entregar el ejercicio número 1.a y 1.c.

Ejercicio 1.

a) Suponga una estructura de hash cerrada con técnica de resolución lineal con una sola ranura por balde y  $h(x) = x \bmod 13$  y  $h'(x) = (h(x) + i) \bmod 13$

Para las siguientes claves dibuje la estructura paso a paso y calcule el Rho (una vez cargada la estructura) . Claves : 11, 3, 27, 99, 8, 50, 77, 22, 12, 31, 33, 40, 53

0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(11) = 11 \bmod 13 = 11$$

											11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(3) = 3 \bmod 13 = 3$$

			3								11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(27) = 27 \bmod 13 = 1$$

	27		3								11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(99) = 99 \bmod 13 = 8$$

	27		3					99			11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(8) = 8 \bmod 13 = 8$$

	27		3					99			11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(8) = (8+1) \bmod 13 = 9$$

	27		3					99	8		11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(50) = 50 \bmod 13 = 11$$

	27		3					99	8		11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(50) = (50+1) \bmod 13 = 12$$

	27		3					99	8		11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(77) = 77 \bmod 13 = 12$$

	27		3					99	8		11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

77

$$h'(77) = (77+1) \bmod 13 = 0$$

77	27		3					99	8		11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

22

$$h(22) = 22 \bmod 13 = 9$$

77	27		3					99	8		11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

22

$$h'(22) = (22+1) \bmod 13 = 10$$

77	27		3					99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

12

$$h(12) = 12 \bmod 13 = 12$$

77	27		3					99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

12

$$h'(12) = (12+1) \bmod 13 = 0$$

77	27		3					99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

12

$$h''(12) = (12+2) \bmod 13 = 1$$

77	27		3					99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

12

$$h'''(12) = (12+3) \bmod 13 = 2$$

77	27	12	3					99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

31

$$h(31) = 31 \bmod 13 = 5$$

77	27	12	3		31			99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

33

$$h(33) = 33 \bmod 13 = 7$$

77	27	12	3		31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

40

$$h(40) = 40 \bmod 13 = 1$$

77	27	12	3		31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

40

$$h'(40) = (1+1) \bmod 13 = 2$$

77	27	12	3		31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

40

$$h''(40) = (1+2) \bmod 13 = 3$$

77	27	12	3		31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'''(40) = (1+3) \bmod 13 = 4$$

40												
77	27	12	3	40	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(53) = 53 \bmod 13 = 1$$

53												
77	27	12	3	40	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(53) = (1+1) \bmod 13 = 2$$

53												
77	27	12	3	40	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h''(53) = (1+2) \bmod 13 = 3$$

53												
77	27	12	3	40	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'''(53) = (1+3) \bmod 13 = 4$$

53												
77	27	12	3	40	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h''''(53) = (1+4) \bmod 13 = 5$$

53												
77	27	12	3	40	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h''''''(53) = (1+5) \bmod 13 = 6$$

53												
77	27	12	3	40	31	53	33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$\text{Rho} = 13/13 = 1$$

77	27	12	3	40	31	53	33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

Realice lo mismo utilizando técnica de resolución:

c) pseudoazar  $h'(x) = [h(x) + Z_i] \bmod M$   $Z=(1,5,2,4,3,6)$

0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(11) = 11 \bmod 13 = 11$$

11												
											11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(3) = 3 \bmod 13 = 3$$

3												
			3								11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(27) = 27 \bmod 13 = 1$$

	27		3								11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(99) = 99 \bmod 13 = 8$$

	27		3					99			11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(8) = 8 \bmod 13 = 8$$

	27		3					8			11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(8) = (8+1) \bmod 13 = 9$$

	27		3					99	8		11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(50) = 50 \bmod 13 = 11$$

	27		3					99	8		11	
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(50) = (50+1) \bmod 13 = 12$$

	27		3					99	8		11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(77) = 77 \bmod 13 = 12$$

	27		3					99	8		11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(77) = (77+1) \bmod 13 = 0$$

77	27		3					99	8		11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(22) = 22 \bmod 13 = 9$$

77	27		3					99	8		11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(22) = (22+1) \bmod 13 = 10$$

77	27		3					99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(12) = 12 \bmod 13 = 12$$

77	27		3					99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(12) = (12+1) \bmod 13 = 0$$

77	27		3					99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h''(12) = (12+5) \bmod 13 = 1$$

12												
77	27		3	12				99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(31) = 31 \bmod 13 = 5$$

31												
77	27		3	12	31			99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(33) = 33 \bmod 13 = 7$$

33												
77	27		3	12	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(40) = 40 \bmod 13 = 1$$

40												
77	27		3	12	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(40) = (1+1) \bmod 13 = 2$$

40												
77	27	40	3	12	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h(53) = 53 \bmod 13 = 1$$

53												
77	27	40	3	12	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h'(53) = (1+1) \bmod 13 = 2$$

53												
77	27	40	3	12	31		33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$h''(53) = (1+5) \bmod 13 = 6$$

53												
77	27	40	3	12	31	53	33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12

$$\text{Rho} = 13/13 = 1$$

77	27	40	3	12	31	53	33	99	8	22	11	50
0	1	2	3	4	5	6	7	8	9	10	11	12