Trabajo práctico 6 - Estructuras de Dispersión

Ejercicio 1

a) Suponga una estructura de hash cerrada con técnica de resolución lineal con una sola ranura por balde y h(x)= x mod 13 y h´(x) = (h(x) + i) mod 13
Para las siguientes claves dibuje la estructura paso a paso y calcule el Rho (una vez cargada la estructura).

Referencias:

Se inserto

No se pudo insertar

Resolución

M = 13 (Baldes)
r = 1 (Ranuras)
h(x) = x mod 13
h´(x) = (h(x) + i) mod 13
N = 13 (Cantidad de elementos)
Claves: 11, 3, 27, 99, 8, 50, 77, 22, 12, 31, 33, 40, 53
ρ (rho) = N / M * r = 13 / 13*1 = 1

Aclaración: la primer fila son los índices

Insertar = 11
h(x) = 11 mod 13 = 11

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

Insertar = 3
h(x) = 3 mod 13 = 3

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

Insertar = 27
h(x) = 27 mod 13 = 1

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

Insertar = 99
h(x) = 99 mod 13 = 8

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

Insertar = 8
h(x) = 8 mod 13 = 8
h´(x) = (8 + 1) mod 13 = 9 mod 13 = 9 i = 1

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

Insertar = 50
h(x) = 50 mod 13 = 11
h´(x) = (11+1) mod 13 = 12 mod 13 = 12 i = 1

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

Insertar = 77
h(x) = 77 mod 13 = 12
h´(x) = (12+1) mod 13 = 13 mod 13 = 0 i = 1

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

Insertar = 22
h(x) = 22 mod 13 = 9
h´(x) = (9+1) mod 13 = 10 mod 13 = 10 i = 1

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

Insertar = 12

h(x) = 12 mod 13 = 12

h´(x) = (12+1) mod 13 = 13 mod 13 = 0 i = 1

h´(x) = (12+2) mod 13 = 14 mod 13 = 1 i = 2

h´(x) = (12+3) mod 13 = 15 mod 13 = 2 i = 3

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

Insertar = 31

h(x) = 31 mod 13 = 5

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

Insertar = 33

h(x) = 33 mod 13 = 7

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

Insertar = 40

h(x) = 40 mod 13 = 1

h´(x) = (1+1) mod 13 = 2 mod 13 = 2 i = 1

h´(x) = (1+2) mod 13 = 3 mod 13 = 3 i = 2

h´(x) = (1+3) mod 13 = 4 mod 13 = 4 i = 3

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

Insertar = 53

h(x) = 53 mod 13 = 1

h´(x) = (1+1) mod 13 = 2 mod 13 = 2 i = 1

h´(x) = (1+2) mod 13 = 3 mod 13 = 3 i = 2

h´(x) = (1+3) mod 13 = 4 mod 13 = 4 i = 3

h´(x) = (1+4) mod 13 = 5 mod 13 = 5 i = 4

h´(x) = (1+5) mod 13 = 6 mod 13 = 6 i = 5

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

RESULTADO

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

c) seudoazar h´(x) = [h(x) + Zi] mod M Z = (1,5,2,4,3,6)

Resolución

M = 13 (Baldes)
r = 1 (Ranuras)
h(x) = x mod 13
h´(x) = (h(x) + Zi) mod 13
Z = (1,5,2,4,3,6)
N = 13 (Cantidad de elementos)
Claves: 11, 3, 27, 99, 8, 50, 77, 22, 12, 31, 33, 40, 53
ρ (rho) = N / M * r = 13 / 13*1 = 1

Aclaración: la primer fila son los índices

Insertar = 11
h(x) = 11 mod 13 = 11

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

Insertar = 3
h(x) = 3 mod 13 = 3

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

Insertar = 27
h(x) = 27 mod 13 = 1

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

Insertar = 99
h(x) = 99 mod 13 = 8

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

Insertar = 8
h(x) = 8 mod 13 = 8
h´(x) = (8 + 1) mod 13 = 9 mod 13 = 9 i = 1 Z = 1

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

Insertar = 50
h(x) = 50 mod 13 = 11
h´(x) = (11+1) mod 13 = 12 mod 13 = 12 i = 1 Z = 1

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

Insertar = 77
h(x) = 77 mod 13 = 12
h´(x) = (12+1) mod 13 = 13 mod 13 = 0 i = 1 Z = 1

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

Insertar = 22
h(x) = 22 mod 13 = 9
h´(x) = (9+1) mod 13 = 10 mod 13 = 10 i = 1 Z = 1

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

Insertar = 12
h(x) = 12 mod 13 = 12
h´(x) = (12+1) mod 13 = 13 mod 13 = 0 i = 1 Z = 1
h´(x) = (12+5) mod 13 = 17 mod 13 = 4 i = 2 Z = 5

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

Insertar = 31
h(x) = 31 mod 13 = 5

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

Insertar = 33
h(x) = 33 mod 13 = 7

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

Insertar = 40
h(x) = 40 mod 13 = 1
h´(x) = (1+1) mod 13 = 2 mod 13 = 2 i = 1 Z = 1

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

Insertar = 53
h(x) = 53 mod 13 = 1
h´(x) = (1+1) mod 13 = 2 mod 13 = 2 i = 1 Z = 1
h´(x) = (1+5) mod 13 = 6 mod 13 = 6 i = 2 Z = 5

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

RESULTADO

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