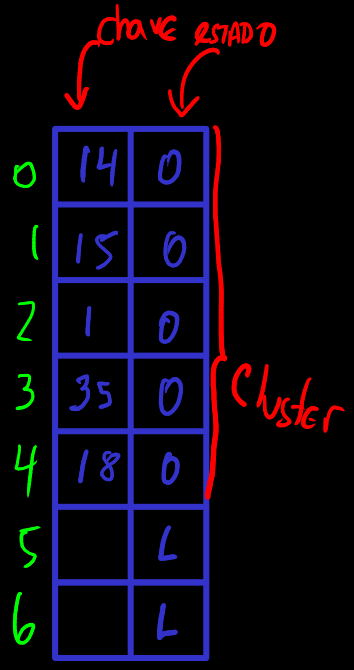
# Hashing: Funções de Sondagem

$$h(x,k) = (h(x) + p(x,k)) \% M$$

Sondagem linear

$$h(x,k) = h(x) + k$$



# Sondagem Quadrática

$$P(x,k) = k^2$$

$$h(x,k) = (h(x) + k^2) \% M$$

$$h(x,k) = ((x \% M) + k^2) \% M$$

$h(18,0) = ((18 \% 7) + 0^2) \% 7 = 4$

$h(3,0) = ((3 \% 7) + 0^2) \% 7 = 3$

$h(38,0) = ((38 \% 7) + 0^2) \% 7 = 3$

$h(38,1) = ((38 \% 7) + 1^2) \% 7 = 4$

$h(38,2) = ((38 \% 7) + 2^2) \% 7 = 0$

$h(12,0) = ((12 \% 7) + 0^2) \% 7 = 5$

$h(10,0) = ((10 \% 7) + 0^2) \% 7 = 3$

$h(10,1) = ((10 \% 7) + 1^2) \% 7 = 4$

$h(10,2) = ((10 \% 7) + 2^2) \% 7 = 0$

$h(10,3) = ((10 \% 7) + 3^2) \% 7 = 5$

$h(10,4) = ((10 \% 7) + 4^2) \% 7 = 5$

$h(10,5) = ((10 \% 7) + 5^2) \% 7 = 0$

| | | |
|---|---|---|
| 0 | 38 | 0 |
| 1 | | 1 |
| 2 | | 1 |
| 3 | 3 | 0 |
| 4 | 18 | 0 |
| 5 | 12 | 0 |
| 6 | | 1 |

# Sondagem Por Hashing Duplo

$$p(x,k) = k\,h_2(x)$$

$$h(x,k) = (h(x) + k\,h_2(x)) \% M$$

$$h(x,k) = ((x \% M) + k((x \% 5)+1)) \% M$$

$h(x) = x \% 7 \quad h_2(x) = (x \% 5)+1$

$h(14) = 14 \% 7 = 0 \quad h_2(14) = (14 \% 5)+1 = 5$

$h(14,0) = (0 + 0(5)) \% 7 = 0$

$h(18) = 18 \% 7 = 4 \quad h_2(18) = (18 \% 5)+1 = 4$

$h(18,0) = (4 + 0(4)) \% 7 = 4$

$h(21) = 21 \% 7 = 0 \quad h_2(21) = (21 \% 5)+1 = 2$

$h(21,0) = (0 + 0(2)) \% 7 = 0$

$h(21,1) = (0 + 1(2)) \% 7 = 2$

$h(7) = 7 \% 7 = 0 \quad h_2(7) = (7 \% 5)+1 = 3$

$h(7,0) = (0 + 0(3)) \% 7 = 0$

$h(7,1) = (0 + 1(3)) \% 7 = 3$

$h(35) = 35 \% 7 = 0 \quad h_2(35) = (35 \% 5)+1 = 1$

$h(35,0) = (0 + 0(1)) \% 7 = 0$

$h(35,1) = (0 + 1(1)) \% 7 = 1$

| | | |
|---|---|---|
| 0 | 14 | 0 |
| 1 | 35 | 0 |
| 2 | 21 | 0 |
| 3 | 7 | 0 |
| 4 | 18 | 0 |
| 5 | | L |
| 6 | | L |