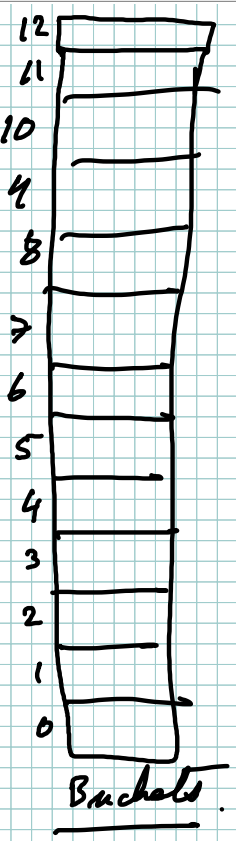
(Person, K)

Person
- name
- addr
- B.D.
- SS#
- GENDER
- AGE
- getKey()

Person implements KeyInterface




KeyInterface {
intgetKey()
}

Key % HTSize

Key % 13

(Person, K)

$P_1$ (k = 27)
27 % 13 = 1

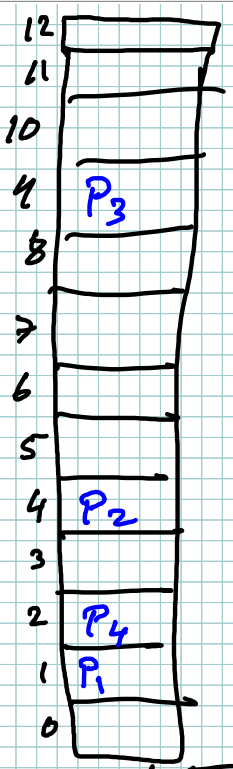
$P_2$ (k = 17)
17 % 13 = 4

$P_3$ (k = 22)
22 % 13 = 9

$P_4$ (k = 15)
15 % 13 = 2

$P_5$ (k = 40)
40 % 13 = 1

Solve collision Problem




Buckets
Person[]

Key Interface{
intgetKey()
}

Key % HtSize
Key % 13

(Person, K)

insert(P)

find(K)

find(40) → $P_5$

40 % 13 = 1

$P_1$ (K = 27)

27 % 13 = 1

$P_2$ (K = 17)

17 % 13 = 4

$P_3$ (K = 22)

22 % 13 = 9

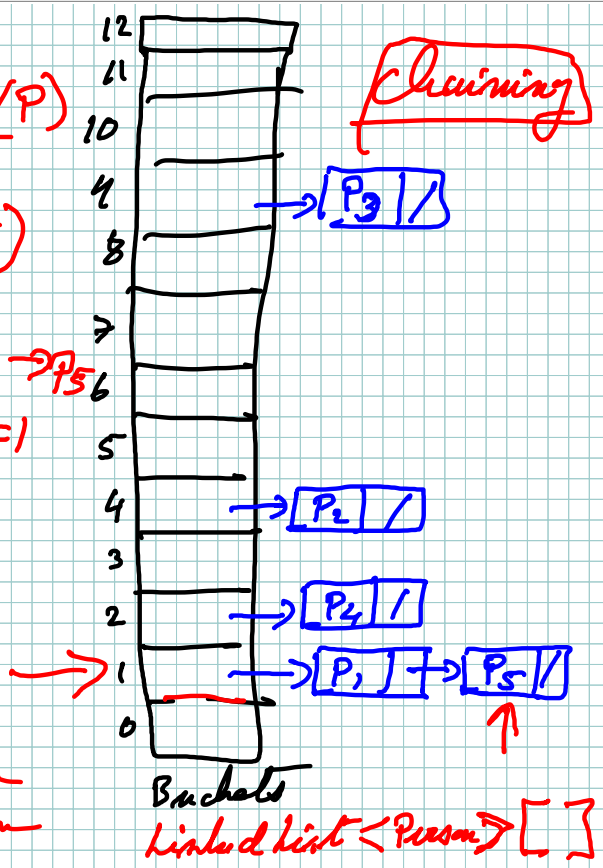
$P_4$ (K = 15)

15 % 13 = 2

$P_5$ (K = 40)

40 % 13 = 1

Solve collision Problem




Chaining

Linked list<Person>[ ]

(Person, K)

insert(P)

find(K)

find(40) → P6

40 % 13 = 1

$P_1$ (K = 27)
27 % 13 = 1

$P_2$ (K = 17)
17 % 13 = 4

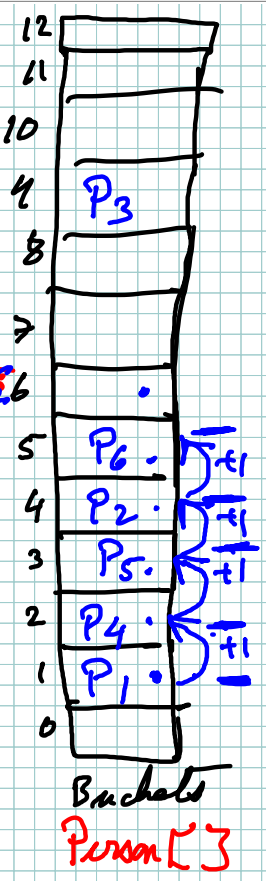
$P_3$ (K = 22)
22 % 13 = 9

$P_4$ (K = 15)
15 % 13 = 2

$P_5$ (K = 40)
40 % 13 = 1

$P_6$ (K = 53)
53 % 1 = 1

Solve collision Problem




Linear Probing

find(K = 66)
66 % 13 = 1

(Person, k)

$P_1$ (k = 27)
27 % 13 = 1

$P_2$ (k = 17)
17 % 13 = 4

$P_3$ (k = 22)
22 % 13 = 9

$P_4$ (k = 15)
15 % 13 = 2

$P_5$ (k = 40)
40 % 13 = 1

insert(P)

find(k)

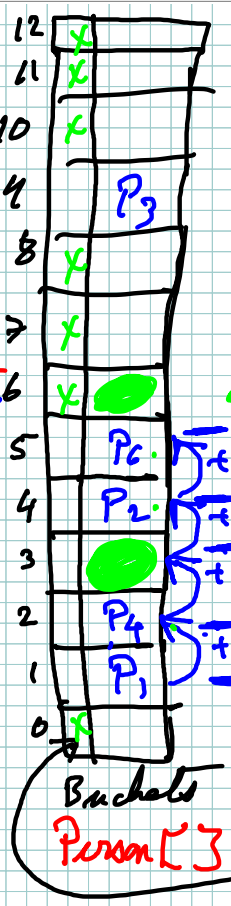
find(40) → $P_5$

40 % 13 = 1

Find

$P_6$ (k = 53)
53 % 1 = 1

Solve collision Problem




Linear Probing

remove (k=40)
40 % 13 = 1

53 % 13 = 1

66 % 13 = 1
DOES NOT EXIST

find (k=22)
22 % 13 = 9

EMPTY FROM BEGINNING

(Person, K)

$P_1$ (K = 27)
27 % 13 = 1

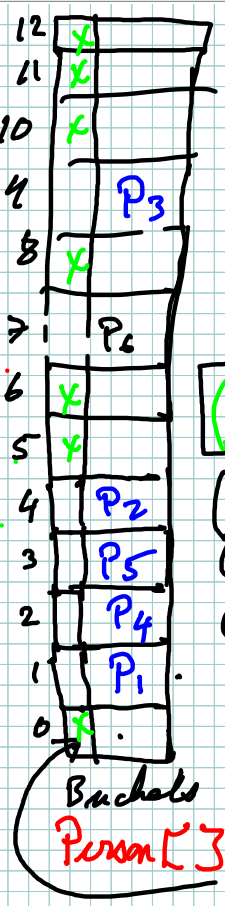
$P_2$ (K = 17)
17 % 13 = 4

$P_3$ (K = 22)
22 % 13 = 9

$P_4$ (K = 15)
15 % 13 = 2

$P_5$ (K = 40)
40 % 13 = 1

$P_6$ (K = 53)
53 % 13 = 1




Quadratic Probing
$(H + c_1 * i + c_2 * i^2)$
$c_1$ & $c_2$ are constants = 1
i is probe #

$(H + i + i^2)$ % SIZE

$(1 + 1 + 1^2)$ % 13 = 3
$(1 + 2 + 2^2)$ % 13 = 7
$(1 + 3 + 3^2)$ % 13 = 0

EMPTY FROM BEGINNING

(Person, K)

$P_1$ (K = 27)
27 % 13 = 1

$P_2$ (K = 17)
17 % 13 = 4

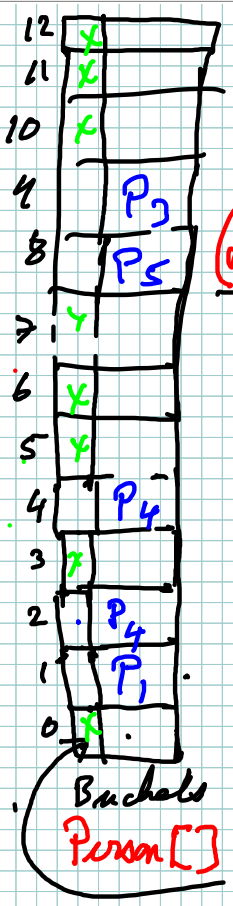
$P_3$ (K = 22)
22 % 13 = 9

$P_4$ (K = 15)
15 % 13 = 2

$P_5$ (K = 40)
40 % 13 = 1

$P_6$ (K = 53)
53 % 13 = 1

$H_1 = K$
$H_2 = K/2$




DOUBLE HASHING

$(H_1 + i * H_2) \% SIZE$

$(H_1) \% SIZE$

$(H_1 + 1 * H_2) \% SIZE$

$(H_1 + 2 * H_2) \% SIZE$

27 % 13 = 1
17 % 13 = 4
22 % 13 = 9
15 % 13 = 2
40 % 13 = 1
40 + 1 * 20 = 60 % 13 = 8

EMPTY FROM BEGINNING