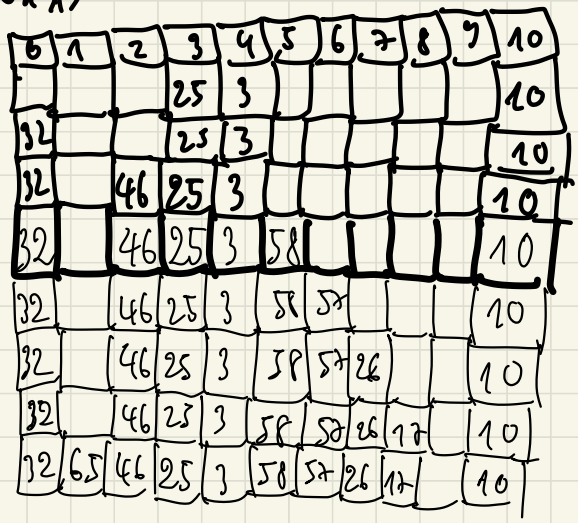
Q1 17)



keys	# probes
25	1
3	2
10	1
32	2
46	1
58	3
57	5
26	4
17	2
65	3

average after 8 insertions:

$(1+2+1+2+1+3+5+4)/8$

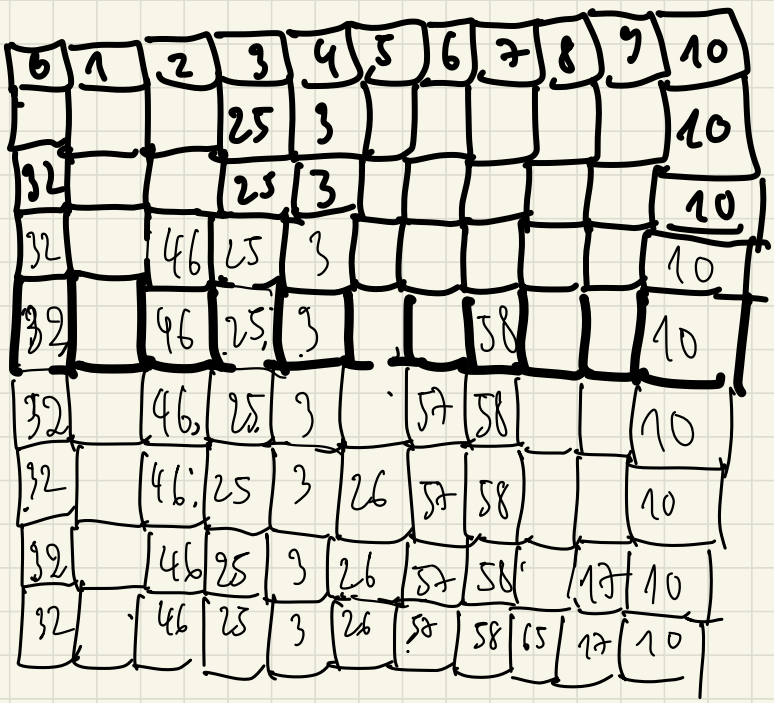
$= 2.375$

average at the end:

$(1+2+1+2+1+3+5+4+2+3)/10$

$= 2.4$

Q1b)



Keys	# probes
25	1
3	2
10	1
32	2
46	1
58	3
57	3
26	2
17	6
65	4

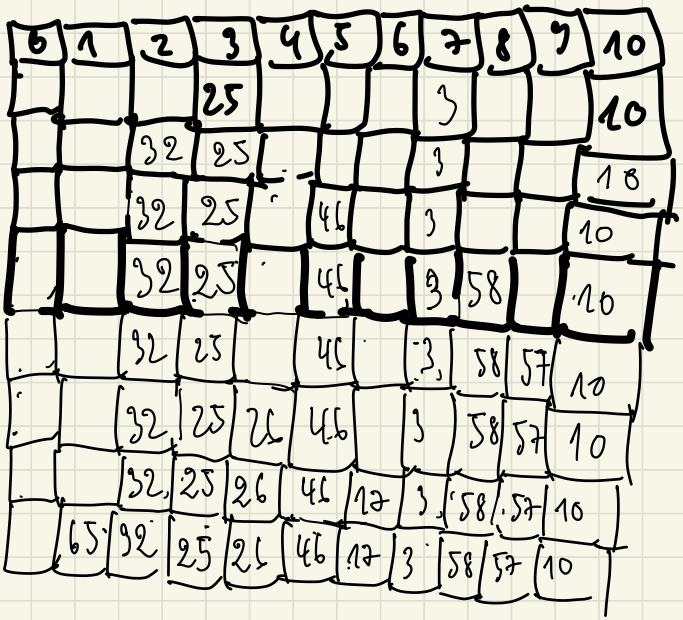
Average number of probes after 8 insertions:

$(1+2+1+2+1+3+3+2)/8 = 1.875$

Average number of probes at the end

$(1+2+1+2+1+3+3+2+6+4)/10 = 2.5$

Q1 c



Keys	# probes
25	1
3	2
10	1
32	2
46	2
58	2
57	4
26	1
17	1
65	6

Average of probes after 8 insertion:

(1+2+1+2+2+2+4+1)/8 = 1.875

Average of probes at the end:

(1+2+1+2+2+2+4+1+1+6)/10 = 2.2

Question 2

a) Insert key 16:

$(3 \cdot 16 + 1) \bmod 11$ = probe 5 (filled)

$(48 + 1^2) \bmod 11$ = probe 6 (filled)

$(48 + 2^2) \bmod 11$ = probe 8

So we insert key 48 at index 8

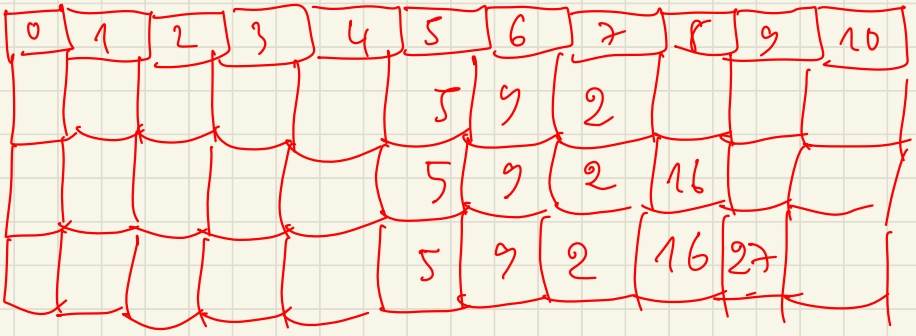
Insert 27

$((5 \cdot 27) + 1) \bmod 11$ -> probe 5 (filled)

$(82 + 1^2) \bmod 11$ -> probe 6 (filled)

$(82 + 2^2) \bmod 11$ -> probe 9 (empty)

We insert key 27 at index 9



Q2 ():

search key 11:

$((3 \times 11) + 1) \bmod 11 = 1$: available

$34 + 1^2 \bmod 11 = 2$: available

$34 + 2^2 \bmod 11 = 5$: Occupied and different

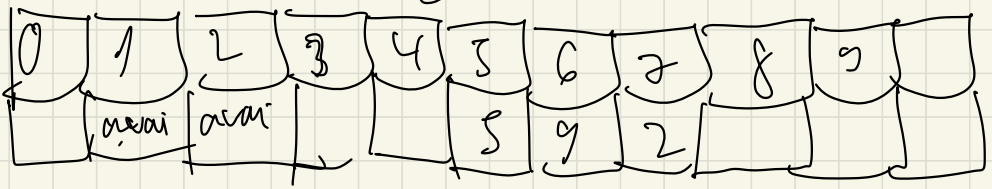
$34 + 3^2 \bmod 11 = 10$: Found

Q2b) Delete key 0

$(3 \times 0 + 1) \bmod 11 = 1$: available

-> $1 + 1 \bmod 11 = 2 \Rightarrow$ found

-> solve delete key 0 at probe 2



Q2 d) insert

$(3 \times 7 + 1) \bmod 11 = 0$ (occupied and different)

probing new cell : $(22+1) \bmod 11 = 1$: available

probing new cell : $(22+2^2) \bmod 11 = 4$ (empty)

so insert key 7 at probe 4