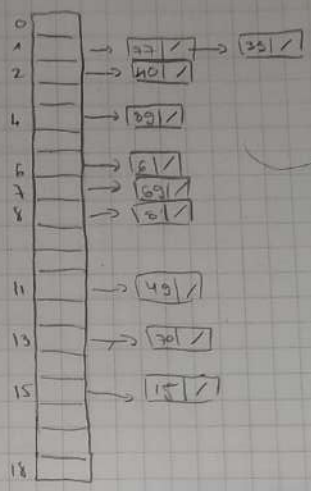
DZ

(1) ključevi: 77, 69, 39, 70, 6, 8, 40, 89, 49, 15

a) $m = 19$

$h(k) = k \bmod m$

$h(77) = 77 \bmod 19 = 1$
$h(69) = 7$
$h(39) = 1$
$h(70) = 13$
$h(6) = 6$
$h(8) = 8$
$h(40) = 2$
$h(89) = 4$
$h(49) = 11$
$h(15) = 15$

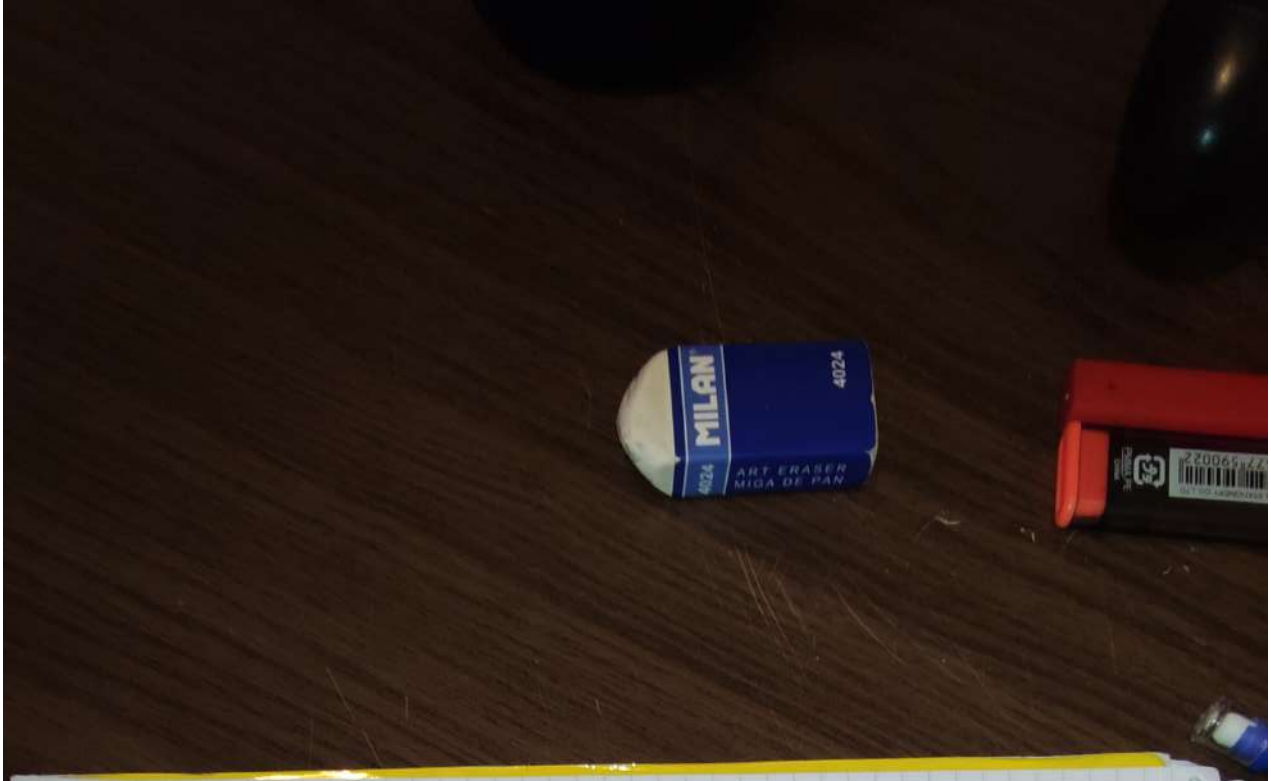


b) $i = 0, 1, 2, \ldots, m-1$
dvostruko prebacivanje

$h(k,i) = [h_1(k) + i * h_2(k)] \bmod m \Rightarrow h(k,i) = (k \bmod m + i \cdot (1 + (k \bmod (m-1)))) \bmod m$

$h_1(k) = k \bmod m$
$h_2(k) = 1 + (k \bmod (m-1))$

- ako je mj. slobodno postavi ključ,
ako ne pokušavaj dok ne dođeš
do slobodnog mjesta



① $f(x)$ nije univerzalna, p mora biti prost br. $(p=\varepsilon)$

kontraprimjer $a_i = 0, \forall i = 1, \dots, n$

$f(x) = 0, \forall x$

② zad

n razr. Hj. u tablicu duljine m, uniformno raspršivanje

$$E[\{k,\ell\} : k \neq \ell, h(k) = h(\ell)] = \sum_{i=1}^{n} P(h(k) = h(\ell)) = \sum_{i=1}^{n} \frac{1}{m} = \frac{n(n-1)}{2m}$$