K-MEANS$(k, \tau, \{x^{(i)}\}_{i=1}^{n})$

1 $\mu, y = \text{randinit}$
2 **for** $t = 1$ **to** τ
3 $\quad y_{old} = y$
4 $\quad$ **for** $i = 1$ **to** n
5 $\quad\quad y^{(i)} = \arg\min_j \left\| x^{(i)} - \mu^{(j)} \right\|_2^2$
6 $\quad$ **for** $j = 1$ **to** k
7 $\quad\quad \mu^{(j)} = \frac{1}{N_j} \sum_{i=1}^{n} 1(y^{(i)} = j) x^{(i)}$
8 $\quad$ **if** $1(y = y_{old})$
9 $\quad\quad$ break
10 **return** μ, y