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

1 $\mu, y$ = randinit
2 **for** $t = 1$ **to** $\tau$
3 $\quad y_{\texttt{old}} = y$
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** $1(y = y_{\texttt{old}})$
9 $\quad\quad$ break
10 **return** $\mu, y$