Input:

C: regularization parameter
tol: numerical tolerance
max_passes: max # of times to iterate over α's without changing
$(x^{(1)}, y^{(1)}), \ldots, (x^{(m)}, y^{(m)})$: training data

Output:

$\alpha \in \mathbb{R}^m$: Lagrange multipliers for solution
$b \in \mathbb{R}$: threshold for solution

- Initialize $\alpha_i = 0, \forall i, \quad b = 0$.
- Initialize $passes = 0$.

    - **for** $i = 1, \ldots m$,
        - Calculate $E_i = f(x^{(i)}) - y^{(i)}$ using (2).
        - **if** $((y^{(i)} E_i < -tol \quad \&\& \quad \alpha_i < C) \; || \; (y^{(i)} E_i > tol \quad \&\& \quad \alpha_i > 0))$