1. Initialization

(a) Initialize the labeling of the experiments by randomly assigning each experiment to one of $k$ classes. For $k > 2$ require each class to have at least 5 experiments.

(b) Initialize the 'temperature' $T = T_{start}$.

2. Procedure to optimize the partition score.

(a) Calculate the partition score ($S$) for the labeling.

(b) Randomly pick an experiment and change its label to a different label.
   - if $k = 2$, the experiment is randomly selected from all experiments.
   - if $k > 2$, the experiment is randomly selected from classes having more than 5 experiments.

(c) Calculate the score for the changed labeling ($S_{new}$).
   - Accept the changed labeling, if $S_{new} > S$; otherwise, accept it with probability $e^{(S_{new} - S)/T}$.
   - If the changed labeling is accepted set $S = S_{new}$. If not, keep the original labeling and $S$.

(d) Decrease $T$ by a factor $\eta$ ($T \leftarrow \eta T$), if $N_{success}$ changed labelings have been accepted, or $N_{total}$ changed labelings have been proposed at the current $T$.

(e) Repeat steps 2(b)-2(d) until $T$ in step 2(d) becomes smaller than $T_{end}$.

3. Extract all partitions with scores larger than a threshold ($S_c$) and the discriminatory genes associated with each of them.