The Fiduccia and Mattheyses (FM) Algorithm

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1. Take the initial x^0, calculate $f(x^0)$, set $x^{max} = x^0$; $flag = 1$, Pass=1
2. Let F be the set of indices corresponding to unlocked/free variables (initially $F = \{1, 2, \cdots, n\}$). Let L be the set of indices corresponding to locked variables (initially $L = \emptyset$)
3. WHILE $flag = 1$
3.1 Set $flag = 0$ & Epoch=0. Set $F = \{1, 2, \cdots, n\}$, $L = \emptyset$
3.1.1 Until Epoch=n DO
3.1.2 For each $j \in F$ based on x^t (x^0 for Epoch=0), calculate $x^j = (x_1, \cdots, 1 - x_j, \cdots, x_n)$ by flipping x_j and find $f(x^j)$.
3.1.3 Let $x^t = \arg\max_j \{f(x^j),\ j \in F\}$. Set $F = F \backslash \{t\}$, $L = L \cup \{t\}$, Epoch=Epoch+1
3.1.4 EndDO
3.2 Let x^t be the best solution at the end of the t-th Epoch and $x = \arg\max_t \{f(x^t), t \in L\}$
3.3 IF $f(x) > f(x^0)$
3.3.1 $x^{max} = x$, $x^0 = x$, flag=1, Pass=Pass+1
3.4 ENDIF
4. ENDWHILE
5. RETURN x^{max}
