```
 1: function SEARCH (R)
 2:     P.PUSH({} , 1)
 3:     while (C, L) ← P.POP() do
 4:         if VALID (R, C) then
 5:             return C
 6:         else
 7:             i ← lowest quality unconsidered position
 8:             for nt ∈ [A, C, G, T] do
 9:                 if R[i] == nt then
10:                     C_nt = C
11:                 else
12:                     C_nt = C + (i, nt)
13:                 L_nt ← LIKELIHOODRATIO (R, C_nt)
14:                 if L_nt > likelihood_threshold then
15:                     P.PUSH(C_nt , L_nt )
16:     return {}
```