**Input:** *G* = (*V*, *E*): graph to analyze

**Input:** *n*, *m*: order and size of G

**Output:** *H*: graph with *n* vertices where the neighbors of each vertex

are those of distance one or two in G

1. **Algorithm:** ExpandedNeighborhood
2. *H* = Graph(*n*) // ϴ(n2)
3. for *v* ∈ *V* do

// ϴ(deg u) per iteration, ϴ(deg v) iterations: total ϴ(Σ deg u)

1. for *u* ∈ *NG*(*v*) do
2. *H*.AddEdge(*v*, *u*) // ϴ(1)

// [ϴ(n) or ϴ(Δ)] × ϴ(deg w) = ϴ(n deg v) or ϴ(Δ deg v)

1. for *w* ∈ *NG*(*u*) do
2. *H*.AddEdge(*v*, *w*) // ϴ(1)
3. end
4. end
5. end
6. return *H*  // ϴ(1)

Σ(n deg v) or Σ(Δ deg v)

n2 + n × m or n2 + Δ × m