Algorithm 1: C-Phasing Hypergraph Construction

Input: Pore-C Table
Output: Incidence matrix H

for each concatemer j **do**
  if fragment locus in contig i **then**
    if number of contigs $2 \leq n_j \leq 15$ *and* alignment length $l_i \geq 500$ **then**
      $H(i, j) = 1$
    else
      $H(i, j) = 0$
    end
  else
    $H(i, j) = 0$
  end
end

Algorithm 2: C-Phasing HyperPartition

Input: Hypergraph incidence matrix H
Output: Cluster assignments C
// Compute adjacency matrix
$W = I$; // initial input unweighted graph
$A = HW(D_e - I)^{-1}H^T$;
$A = zero\_diag(A)$;
$C = LOUVAIN\_ALGORITHM(A)$;
$c = length(C)$; // Number of cluster
$W_{prev} = W$;
repeat
  // reweight for each hyperedge
  for $e \in E$ **do**
    for $i \in [1, .., c]$ **do**
      $k_i = |e \cap C_i|$;
    end
    $e_n = length(e)$; // Number of contig in e
    $W_{new}(e) = \frac{1}{m} \sum_{i=1}^{c} \frac{1}{k_i+1}(e_n + c)$;
    $W(e) = \frac{1}{2}(W_{new}(e) + W_{prev}(e))$
  end
  $A = HW(D_e - I)^{-1}H^T$;
  $A = zero\_diag(A)$;
  $C = LOUVAIN\_ALGORITHM(A)$;
  $c = length(C)$;
  $W_{prev} = W$
until $||W - W_{prev}||$<0.01;