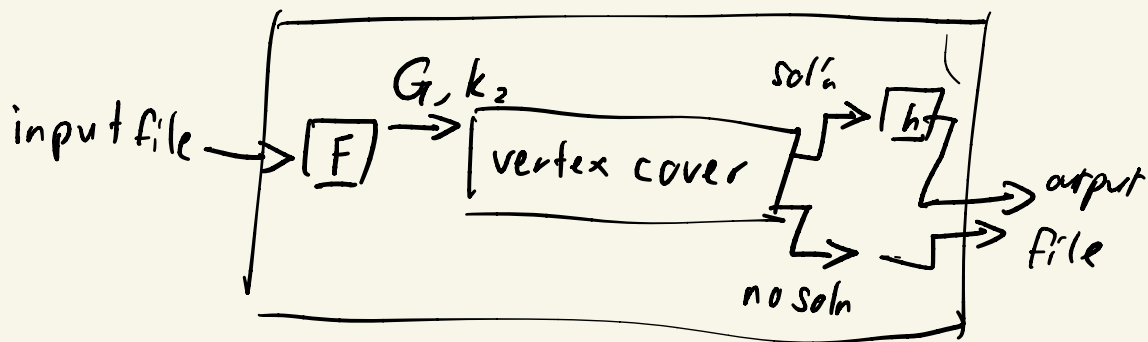


Reduction diagram

3 SAT



- Input File : Has the proposition where there are ≥ 3 literals per clause & k clauses.
- G is the graph form from the proposition
- k_2 is $|V|$ in G minus k clauses
- Sol'n is a vertex cover S of cardinality k_2
- no sol'n means no cover exist
- output file : if sol'n - the set $|V| - k$ representing satisfying assignment
else : no satisfying assignment

Function F

- Takes propositions and group them into a 2D array where row represents the i th clause and column represents the literal in the clause.

Function H

- Takes the vertex cover and find those excluded from the graph
- Vertex excluded in the cover is the satisfying assignment.

3 SAT (proposition)

input: proposition with 3 literal per k clauses

output: A satisfying assignment

$G, k = F(\text{proposition})$

cover = vertex cover (G, E)

return $H(\text{cover})$

F (proposition)

input: proposition of 3 literal per k clauses

output: Graph G representing proposition
and cardinality $k_2 = |V| - k$

for all i th clause in proposition,

for all j literal in i th clause,

make vertex (literal(i)(j))

add edge if $i = j$ or $p_i \equiv \neg p_j$;

if literal in same clause or
2 literals are negation

return G , $k_2 = |V| - k$

H (cover)

input: vertex cover of graph G
with $k_2 = |V| - k$ clauses

output: satisfying assignment

let S be empty set

for each vertex in G :

if vertex not in cover:

add vertex to S

return S