Assignment 15

L in P.

M = {5}.

L

instance of P

(L) → (P)

Algorith L2M (P):

if verifyP (L):

return 5

else

return null

Algorith VerifyMST (G, max).

- MSTcandidate := MST (G):

Sum := 0

for each e in MST edges do

Sum := Sum + weight (e)

if Sum ≤ max then

return yes

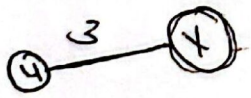
return no.

A. MST

MST reduction problem: S

MST

(G,



(3) max.

(G, u, v, max) → (S, target).

Algorith MST2SS (G, 3 max).

S := new List

S.add (3).

if verifyMST (G, S) .- yes

return ((3) 3).

else

return ((2)).

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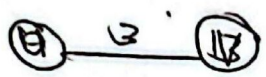
MST

Shortest path.

MST

Shortest



PT reduction

MST

$(G, u, v, max) \longrightarrow (G, max)$.

Algorithm SPIMST(G, u, v, max).

G' = new Graph(G).

u = G'.insertVertex("u")

v = G'.insertVertex("v").

G'.insertEdge(u, v, 3).

if verifySP(G, u, v, max) = yes

return (G', 3).

else

return (G', 2)

Algorithm verifySP(G, u, v, max).

ShortestPath(G, u, v).

cur := v

while cur ≠ u do.

e := getParent(cur)

Sum := weight(e)

if Sum <= max then

return yes

else

return no.