

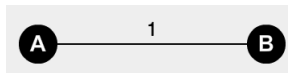
## #3 Assignment - CMPT 405

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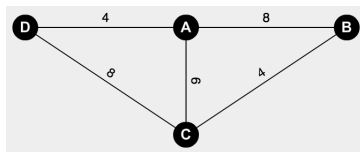
### #1a)

Let  $G_1$  be a graph with two vertices  $A$  and  $B$  and an edge  $(A, B)$  with weight 1. For every shortest path tree  $T_v$ ,  $v \in V$ ,  $T_v$  is also a MST (it is easy to see, as there is only one tree).



### #1b)

Let  $G_2$  be a graph with vertices  $A, B, C$  and  $D$  and edges  $(A, B)$ ,  $(A, D)$ ,  $(A, C)$ ,  $(B, C)$  and  $(C, D)$ , with weights 8, 4, 6, 4 and 8, respectively. Then, no shortest path tree  $T_v$  given by Dijkstra's algorithm is a MST.



MST =  $(A, C), (A, D), (B, C)$

$T_a = (A, B), (A, C), (A, D)$

$T_b = (A, B), (A, D), (B, C)$

$T_c = (A, C), (B, C), (C, D)$

$T_d = (A, B), (A, D), (C, D)$

#2)

#3)

#4)

#5)

References