Exercise 4: Shortest Paths
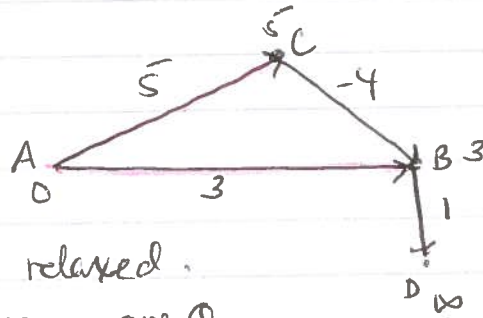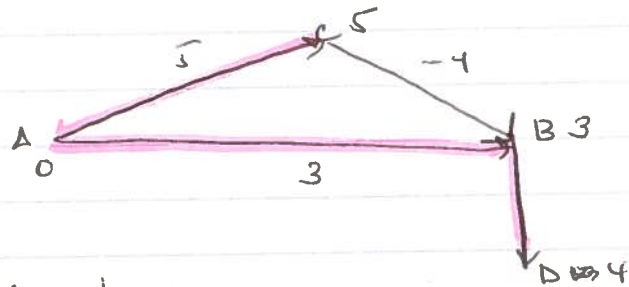
where A is the source:

A is popped out of the
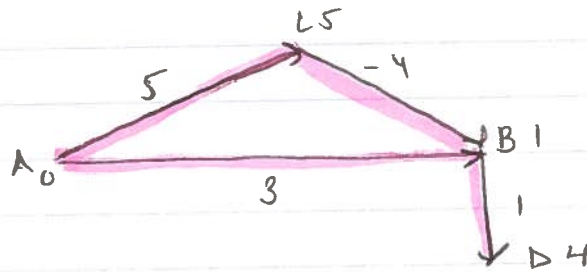queue and (A,C) and (A,B) are relaxed.
B is on top of the min heap queue Q.
B is now popped and we relax the only
edge out of B (B,D) so D has a distance $3 + 1 = 4$

D is on top of the min heap
and D is removed. There are no edges going
out of D to relax, C is the only vertex to relax.
C is removed and edge (C,B) is relaxed. $5 - 4 = 1 < 3$,
distance to B is now updated to 1.

The algorithm will
terminate since the queue
is empty. The path
A → C → B → D has a total
length $5 + (-4) + 1 = 2 < 4$. ∴ The length of the shortest
path from source A to D was not correctly evaluated.