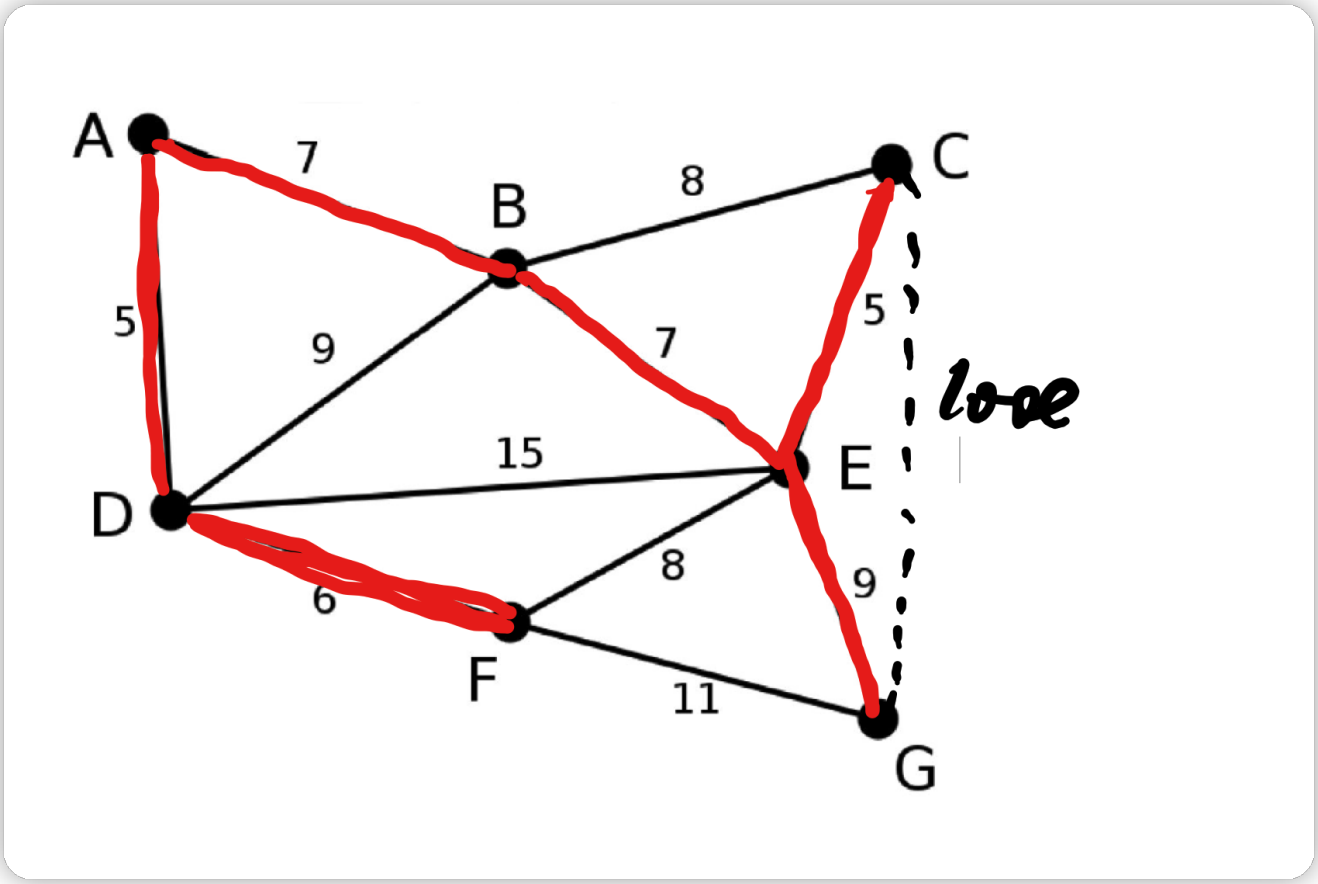

As shown in the graph, the MST is in red.
Because we have a fork on E, so we will need to find a path connect two vertices on both side, and because CG is 1000, so the total cost for APP is (F->D->A->B->E->C->G) = 6 + 5 + 7 + 7 + 5 + 1000 = 1030, which is not a 2-approximation.

Because if we want 2-approximation hold, the graph should have the property that any direct weight of two vertices is smallest. In this Graph, it means CG should not be greater than GE + EC = 5 + 9 = 14. Because the above question is the physical distance between cities. It is already satisfied this restriction. But in this question, if the direct weight of two vertices is not smallest, then we cannot get the result that 2 * (EC+EG) >= CG. Therefore the approximation is not hold.