

# Hotelling's spatial competition model on graphs

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## **Abstract**

We extend a model of spatial competition (Hotelling, 1929) to graphs where consumers are uniformly distributed on the edges. Firms can choose locations anywhere on the graph, not just in vertices. Consumers go to the closest firm, the effect of pricing is not examined. The focus of the paper is on the existence of  $n$ -firm Nash equilibria. We derive necessary conditions on the general class of graphs and a full characterization if the graph in question has only one edge, i.e., it is the unit interval. We also show that for the class of tree graphs the Nash equilibrium is unique if the number of firms is sufficiently small but there is no equilibrium if the number of firms falls into a certain range.