Interview Exercise

Closest point to curve collection

Estimate time: 2-3 hours

Aim

The aim of this exercise is to design an executable program, no GUI necessary, that finds which curve in a collection is closest to an input point.

Inputs

We start with a number of input curves of 2 principle types:

a. Line segments – one point to another
b. Polylines – a series of adjoining line segments

N.B. We would like to be able to add other type of curves e.g. Arcs, Circles, NURBs etc., in the future without redeveloping the program.

Outputs

We then want to define a point and find:

a. which of the curves is geometrically the closest to that point
b. the distance between the point and the curve
c. the point on the curve used to measure the distance

Illustration

The below illustrates the intention of the program:

a. The black curves are the input curves
b. The black dot is the input point
c. The orange dot is the closest point between the input point and the closest curve
d. The cyan line is the distance between the input point and closest curve