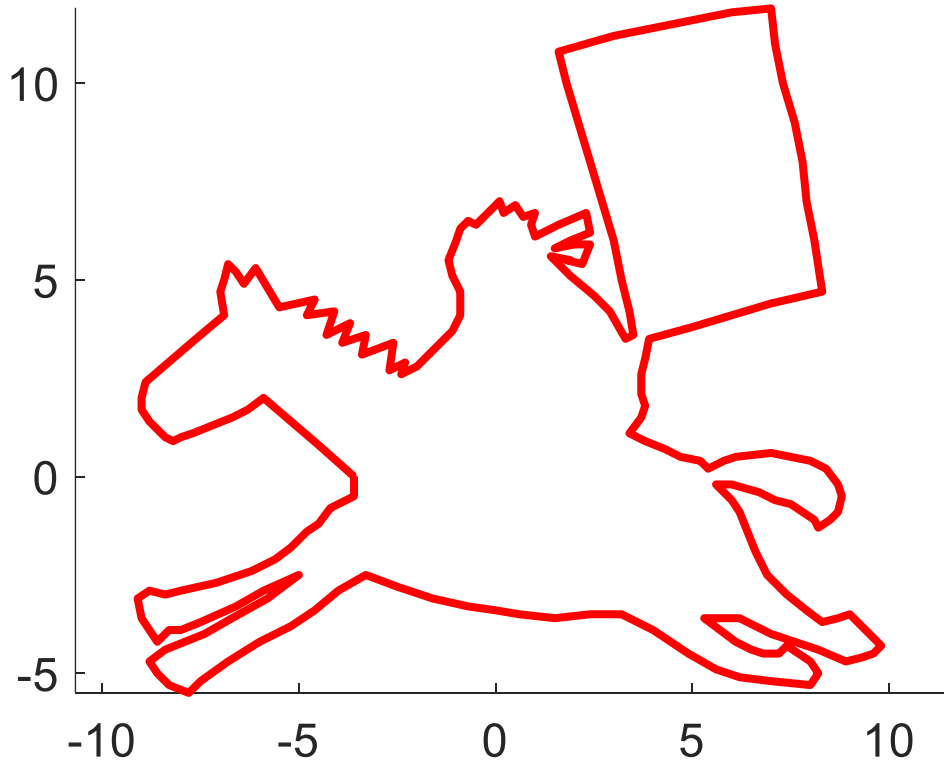
Project 1: Discrete curve visualization and processing

Curve visualization and processing

- The goal of this first project is to implement a tool in Java for manipulating discrete curves in 2D
- In addition to visualizing the curve, we want to compute differential quantities (tangent, normal, curvature) and visualize them



Tasks

- Load curve data using the .vert format
- Visualize the curve using the Java 2D API
- Discrete curve processing:
  - Computation and visualization of the unit tangent to the curve
  - Computation and visualization of the unit normal to the curve
  - Computation of the discrete curvature
  - Evolve the curve by curvature flow

The vert file format

Number of components
Number of vertices in the first component
X1 Y1
X2 Y2
…
Number of vertices in the second component
X1 Y1
X2 Y2
…

The vert file format

- There is an edge between each pair of consecutive vertices
- There is an implicit edge between the final vertex of a given component and the first vertex of this component