

1) A polynomial fit is a single function that is fit using the whole dataset. A spline is a fit that only uses pieces of the dataset to fit. The pieces are "stitched" together with boundary rules on derivatives. So a spline is a piecewise function.

2) See matlab code

3) See matlab code

4) See matlab code

5) See matlab code

6) The reflection improves the fit because the boundary condition enforces a continuous derivative condition at the boundary.