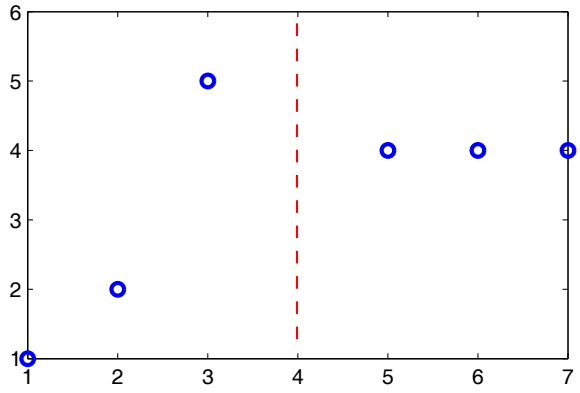
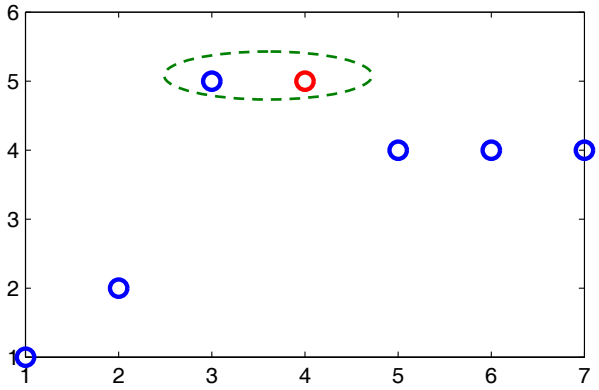
Numerical Interpolation:

```
F(1) = 1;
F(2) = 2;
F(3) = 3;
F(4) = ...
F(5) = 4;
F(6) = 4;
F(7) = 4;
```



0-th order interpolation

```
F(k) = F(k-1);
```



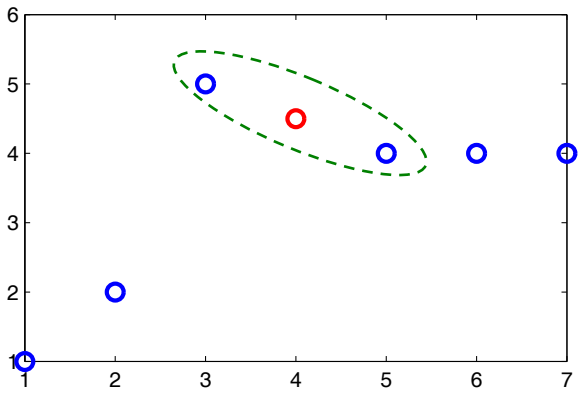
1st order interpolation

Piecewise Linear interpolation:

```
F(k-1) = a*x(k-1) + b
F(k+1) = a*x(k+1) + b
```

Find: a,b;

```
F(k) = a*x(k) +b
```



High order interpolatins

Piecewise Quadratic interpolation:

`F(k) = a*x(k)^2 + b*x(k) + c`

Find: a,b,c

Forward scheme: F(k-2), F(k-1), F(k+1)
Backward scheme: F(k-1), F(k+1), F(k+2)

Read:

polar

To do:

phi = (0 : pi/39.5 : 2*pi);
omega = 4;

F(phi) = 2 + sin(omega*phi - pi/8);

F1(phi) = F'(phi) : 2 point central derivative
F2(phi) = F'(phi) : 5 point derivative

1) L1(1:40) = (Interpolate missing pixels in F1, 0th order interpolation)
2) L2(1:40) = (Interpolate missing pixels in F2, 0th order interpolation)

3) G1(1:40) = (Interpolate missing pixels in F1, linear interpolation)
4) G2(1:40) = (Interpolate missing pixels in F2, linear interpolation)

Polar plot: L1, L2
Polar plot: G1, G2

5) H1(phi) = F''(phi) : 2 point central derivative
6) H2(phi) = F''(phi) : 5 point derivative

Polar plot: H1, H2