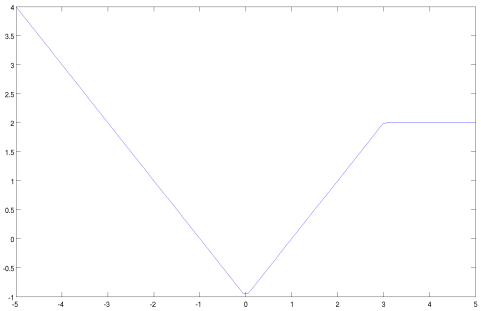
A. Implement and draw a piece-wise function

$$\begin{aligned} f(x) &= 2, \quad \text{if } x > 3 \\ &= x - 1, \text{ if } 3 \geq x > 0 \\ &= -1 - x, \quad \text{if } 0 \geq x. \end{aligned}$$

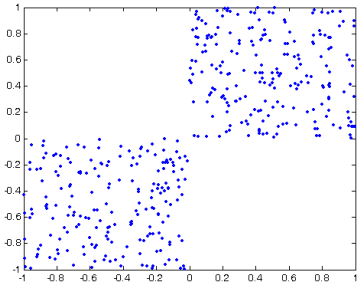


B. Write a matlab function to evaluate prefix expressions,(a) prefix('+',5,4) (b) prefix('-',5,4) (c) prefix('*',5,4), (d) prefix('/',5,4)

C. Let x denote the score. Write a matlab function to grade 'A' for x > 90, 'B' for 80<x≤90, 'C' for70<x≤80, and 'D' for x≤70.

D. Generate a random sample from a square and draw points within I and III quadrants.

E. x=rand(1,5)*2-1; y=rand(1,5)*2-1

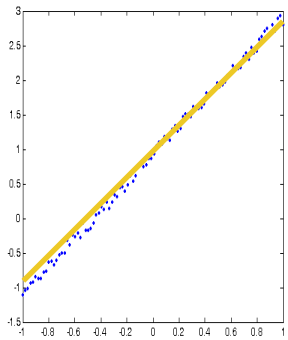


Let $x = (x_1, x_2, x_3, x_4, x_5)$ and $y = (y_1, y_2, y_3, y_4, y_5)$.

(a) Display (x_i, y_i) that satisfies $x_i < 0$ and $y_i > 0$.

(b) Display (x_i, y_i) that is not within the unit circle centered at the origin.

F.



Line fitting to paired data

(a) Create paired data, denoted by $S = \{(x_i, y_i)\}_{i=1}^{N}$, with

$$y_i = ax_i + b + n_i,$$

where a and b are constants and all n_i denote noises uniformly sampled from the interval $[-0.1, 0.1]$.

(b) Write a matlab function to estimate a and b subject to S.

(c) Plot paired data in S and the line expressed by $y = \widehat{a}x + \widehat{b}$, where $\widehat{a}$ and $\widehat{b}$ denote estimated line parameters.