Power iteration, inverse iteration

# Power iteration

## Exercise 1

A = [5 -2 -4; -2 2 2; -4 2 5]

x = rand(3, 1)

x= A\*x; dot(A\*x, x)/norm(x)^2

result 10

## Exercise 2

A = [2 -1 0; -1 2 -1; 0 -1 2]

x = rand(3, 1)

x= A\*x; dot(A\*x, x)/norm(x)^2

result 3.4142

## Exercise 3

A = [0 0 1; 0 0 0; 1 0 0]

x = rand(3, 1)

x= A\*x; dot(A\*x, x)/norm(x)^2

no dominant eigenvalue (-1, 0, 1)

# Inverse iteration

## Exercise 1

A = [5 -2 -4; -2 2 2; -4 2 5]

A = inv(A)

x = rand(3, 1)

x= A\*x; dot(A\*x, x)/norm(x)^2

result 1

## Exercise 2

A = [2 -1 0; -1 2 -1; 0 -1 2]

A = inv(A)

x = rand(3, 1)

x= A\*x; dot(A\*x, x)/norm(x)^2

result 1.7071

## Exercise 3

A = [0 0 1; 0 0 0; 1 0 0]

A = inv(A)

x = rand(3, 1)

x= A\*x; dot(A\*x, x)/norm(x)^2

matrix is singular