

MATLAB R2023a - academic use

HOME PLOTS APPS EDITOR PUBLISH VIEW

New Open Save Compare Print Go To Find Refactor Profiler Run Section Section Break

FILE NAVIGATE CODE ANALYZE Run and Advance Run to End Step Stop

Editor - C:\Users\CSED\Documents\untitled.m

```
untitled.m +  
1 clc  
2 clear all  
3 A = [10, 8, -3, 1;  
4 2, 10, 1, -4;  
5 3, -4, 10, 1;  
6 2, 2, -3, 10];  
7  
8 B = [16; 9; 10; 11];  
9  
10 n = length(B);  
11  
12 for i = 1:n  
13     for j = i+1:n  
14         key = A(j, i)/A(i, i);  
15         A(j, :) = A(j, :) - A(i, :)*key  
16         B(j) = B(j)-B(i)*key  
17     end  
18 end  
19  
20 X = zeros(n, 1);  
21 X(n) = B(n)/A(n, n);  
22 for i = n-1:-1:1  
23     sum = 0;  
24     for j = i+1:n  
25         sum = sum + A(i, j) * X(j)  
26     end  
27     X(i) = (B(i)-sum)/A(i, i)  
28 end  
29
```

Type here to search

# Gauss Elimination Method

Editor - C:\Users\Admin\Desktop\gaussaj.m

```
untitled.m gaussj.m gausselimination.m gaussaj.m +
1 clc
2 clear all
3 x=[1 1.5 2 2.5]
4 y=[2.7183 4.4817 7.3891 12.1825]
5 n=size(x,2)
6 p=2.25
7 d=zeros(n,n)
8 d(:,1)=y
9 for j=2:n
10    for i=1:n-j+1
11       d(i,j)=(d(i+1,j-1)-d(i,j-1))/(x(i+j-1)-x(i))
12    end
13 end
14
15 ans=d(1,1)
16 for i=2:n
17    prod=d(1,i)
18    for j=1:i-1
19       prod=prod*(p-x(j))
20    end
21    ans=ans+prod
22 end
23 disp(ans)
24
```

## Newton Divided Difference

Command Window

The image shows a Dell laptop screen displaying a MATLAB interface. The top menu bar includes options like EDITOR, PUBLISH, VIEW, ANALYZE, and RUN. The left sidebar has sections for Desktop, Folders, Refactor, Bookmarks, and NAVIGATE. The central workspace contains two M-files:

**quadratic.m**

```
3 % quadratic
4 x = [-2 -1 0 1 2];
5 y = [15 11 3 19];
6
7 plot(x, y, '*r')
8 n = length(x);
9
10 A = [n sum(x) sum(x.^2);
11 sum(x) sum(x.^2) sum(x.^3);
12 sum(x.^2) sum(x.^3) sum(x.^4)];
13 B = [sum(y);
14 sum(x.^y);
15 sum(x.^2.*y)];
16
17 X = inv(A)*B;
18 a = X(1);
19 b = X(2);
20 c = X(3);
21
22 hold on
23 X = linspace(-3, 3, 100);
24 f = a + b.*X + c.*X.^2;
25 plot(X, f, 'b')
```

**leastsquare.m**

```
1 clc
2 clear all
3 % linear
4 x = [-2 -1 0 1 2];
5 y = [15 11 3 19];
6
7 plot(x, y, '*r')
8 n = length(x);
9
10 A = [n sum(x); sum(x) sum(x.^2)];
11 B = [sum(y); sum(x.*y)];
12
13 X = inv(A)*B;
14 a = X(1);
15 b = X(2);
16
17 hold on
18 S = linspace(-3, 3, 100);
19 f = a + b.*S;
20 plot(S, f)
```

The right side of the interface shows the **Workspace** window with variables listed:

Name	Value
a	-1.0571
A	[5,0,10]
b	1
B	[39;10;1]
c	4.4286
f	1x100 d
n	5
x	[-2,-1,0,1,2]
X	1x100 d
y	[15,11,3,19]

The bottom of the screen features a red watermark reading "Least Square".

DELL

HOME PLOTS APPS EDITOR

New Open Save Compare Go To Find Copilot Refactor

Bookmark NAVIGATE CODE

MATLAB Drive

QR\_Algo.m X Power\_method.m X Gauss\_Seidal.m X +

/MATLAB Drive/QR\_Algo.m

```
1 clc
2 clear all
3 a = [1 1 0; 1 0 1; 0 1 1]
4 n = size(a, 1)
5 iteration = 100
6
7 for k=1:iteration
8     Q = zeros(n, n)
9     R = zeros(n, n)
10    for j=1:n
11        v = a(:, j)
12        for i = 1: j-1
13            R(i, j) = Q(:, i)'*a(:, j)
14            v = v - R(i, j)*Q(:, i)
15        end
16        R(j, j) = norm(v)
17        Q(:, j) = v/R(j, j)
18    end
19    a = R*Q
20 end
21 disp(Q)
22 disp(R)
23 eigenval = diag(a)
24 disp(eigenval)
```

Ready

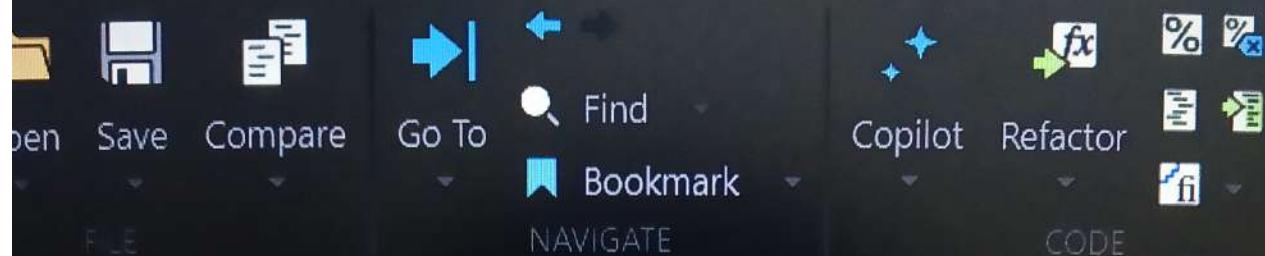
Air Poor Tomorrow

HOME

PLOTS

APPS

EDITOR



QR\_Algo.m X

Power\_method.m X

Gauss\_Seidal.m X

+

MATLAB Drive/Power\_method.m

```
1    clc
2    clear all
3
4    A = [-10 5; 0 1];
5    X = [1; 1];
6    tol = 10^-3;
7    error = 1;
8    count = 0;
9
10   while(error > tol)
11       X_new = A*X;
12       m = max(abs(X_new));
13       X_new = X_new/m;
14
15       %handle sign flip
16       if norm(X_new + X) < norm(X_new - X)
17           error = norm(X_new + X);
18       else
19           error = norm(X_new - X);
20       end
21
22       X = X_new;
23       count = count + 1;
24   end
25
26   disp(m);
27   disp(X);
28   disp(count)
```



Ready



Air: Poor  
Tomorrow

HOME

PLOTS

APPS

EDITOR

PL



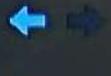
Save



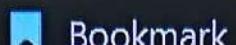
Compare



Go To



Find



Bookmark



Copilot



Refactor



fi

FILE

NAVIGATE

CODE



MATLAB Drive

\_Algo.m X

Power\_method.m X

Gauss\_Seidal.m X



LAB Drive/Gauss\_Seidal.m

```
1 clc
2 clear all
3 a=[10 8 -3 1; 2 10 1 -4; 3 -4 10 1; 2 2 -3 10]
4 b=[16;9;10;11]
5 n=size(a,1)
6 tol=input("enter tol ")
7 error=Inf
8 x=zeros(n,1)

9 while(error>tol)
10     xold = x;

11         for i=1:n
12             sum=0;
13             for j=1:i-1
14                 sum=sum+(a(i,j)*x(j));
15             end
16             for j=i+1:n
17                 sum=sum+(a(i,j)*xold(j));
18             end
19             x(i)=(b(i)-sum)/(a(i,i));
20             error=max(abs(xold-x));
21         end
22     end
23     disp(x)
```

Ready



...

Poor  
tomorrow