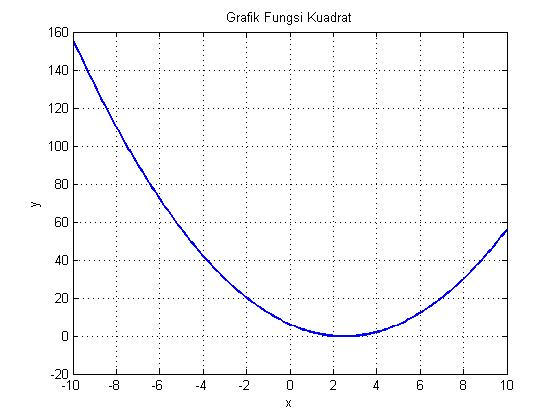
**Tugas 4 Komputasi Matematika\_662022011\_Mutiara Tyas Putri A**

Membuat code berbagai grafik di Matlab



1. Plot fungsi kuadrat

Code :

x = -10:0.1:10;

y = x.^2 - 5\*x + 6;

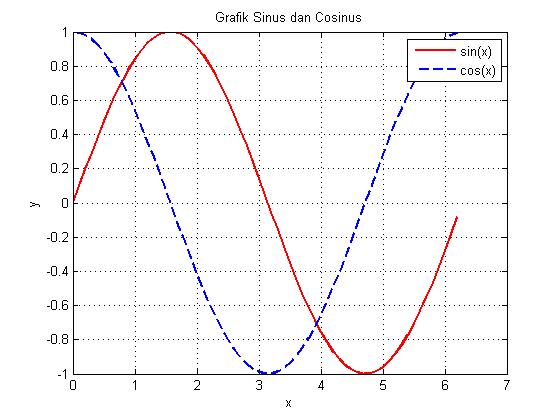
plot(x, y, 'LineWidth', 2);

title('Grafik Fungsi Kuadrat');

xlabel('x'); ylabel('y');

grid on;

1. Plot Fungsi Trigonometri (Sinus & Cosinus)

Code:

x = 0:0.1:2\*pi;

y1 = sin(x);

y2 = cos(x);

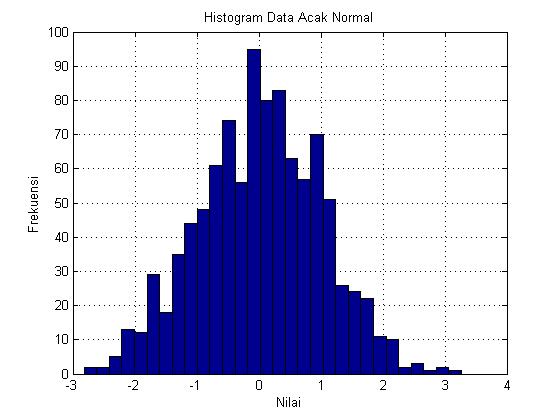
plot(x, y1, 'r', x, y2, 'b--', 'LineWidth', 2);

legend('sin(x)', 'cos(x)');

title('Grafik Sinus dan Cosinus');

xlabel('x'); ylabel('y');

grid on;



1. Histogram Data Acak Normal

Code:

data = randn(1,1000);

histogram(data, 30);

title('Histogram Data Acak Normal');

xlabel('Nilai'); ylabel('Frekuensi');

grid on;

1. Boxplot Data Random

Code:

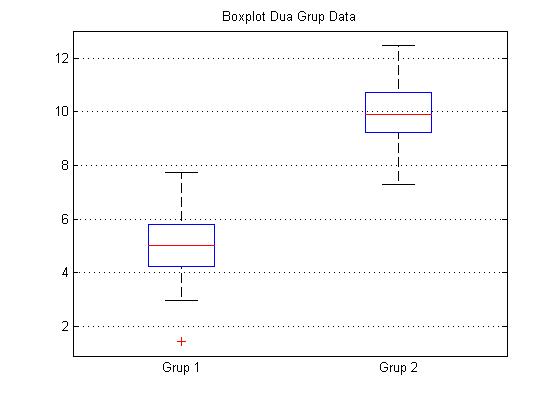
data = [randn(100,1)+5; randn(100,1)+10];

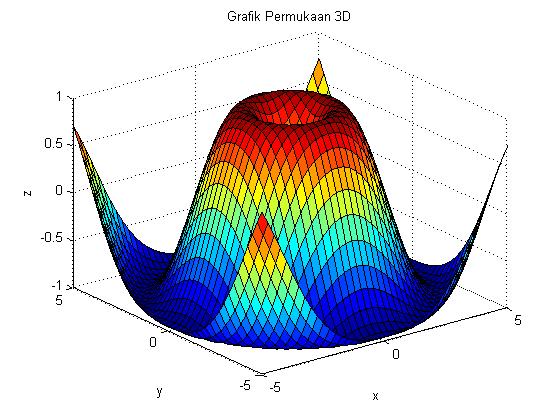
group = [repmat({'Grup 1'},100,1); repmat({'Grup 2'},100,1)];

boxplot(data, group);

title('Boxplot Dua Grup Data');

grid on;





1. Plot 3D Permukaan (Surface Plot)

Code:

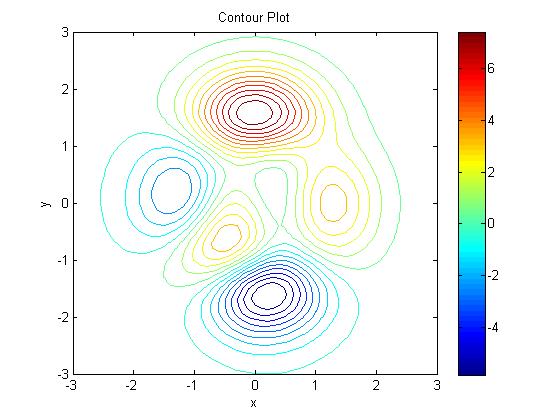
[x, y] = meshgrid(-5:0.25:5, -5:0.25:5);

z = sin(sqrt(x.^2 + y.^2));

surf(x, y, z);

title('Grafik Permukaan 3D');

xlabel('x'); ylabel('y'); zlabel('z');



1. Contour Plot

Code:

[x, y] = meshgrid(-3:0.1:3, -3:0.1:3);

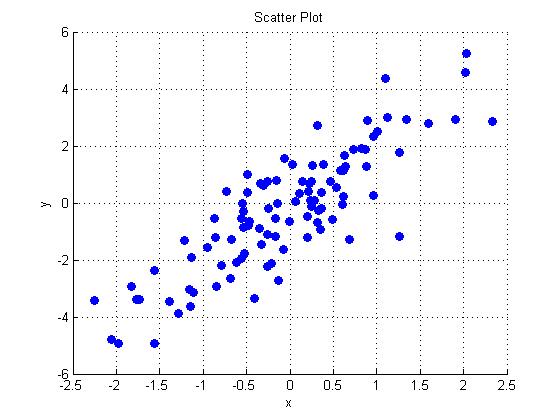
z = peaks(x, y);

contour(x, y, z, 20);

colorbar;

title('Contour Plot');

xlabel('x'); ylabel('y');



1. Scatter Plot (Sebaran Titik)

Code:

x = randn(100,1);

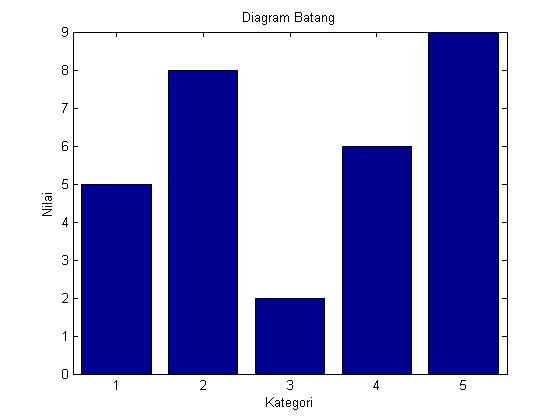
y = 2\*x + randn(100,1);

scatter(x, y, 50, 'filled');

title('Scatter Plot');

xlabel('x'); ylabel('y');

grid on;



1. Bar Chart (Diagram Batang)

Code:

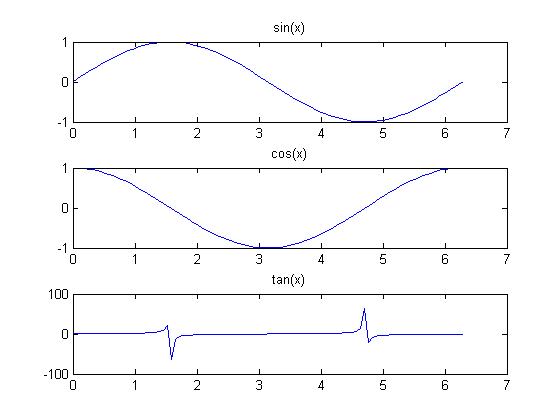
data = [5, 8, 2, 6, 9];

bar(data);

title('Diagram Batang');

xlabel('Kategori'); ylabel('Nilai');

xticklabels({'A','B','C','D','E'});

1. Plot Banyak Fungsi dalam Subplot

Code:

x = linspace(0, 2\*pi, 100);

y1 = sin(x);

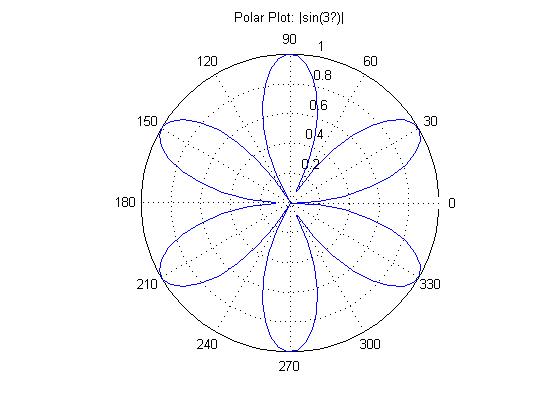
y2 = cos(x);

y3 = tan(x);

subplot(3,1,1); plot(x, y1); title('sin(x)');

subplot(3,1,2); plot(x, y2); title('cos(x)');

subplot(3,1,3); plot(x, y3); title('tan(x)');



1. Polar Plot

Code:

theta = linspace(0, 2\*pi, 100);

rho = abs(sin(3\*theta));

polarplot(theta, rho, 'LineWidth', 2);

title('Polar Plot: |sin(3θ)|');

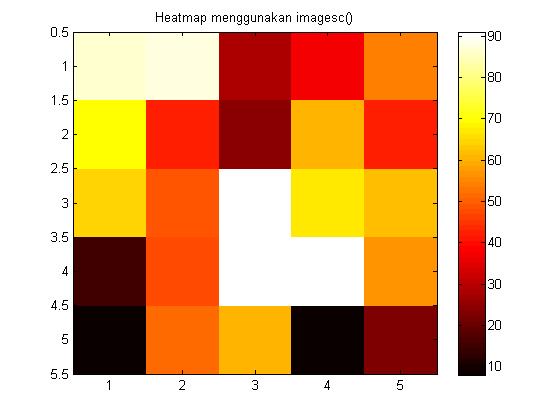
1. Heatmap (Peta Panas)

Code:

data = randi(100, 5, 5);

heatmap(data);

title('Heatmap (Peta Panas)');



1. Stem Plot (Grafik Batang Diskrit)

Code:

x = 0:0.5:10;

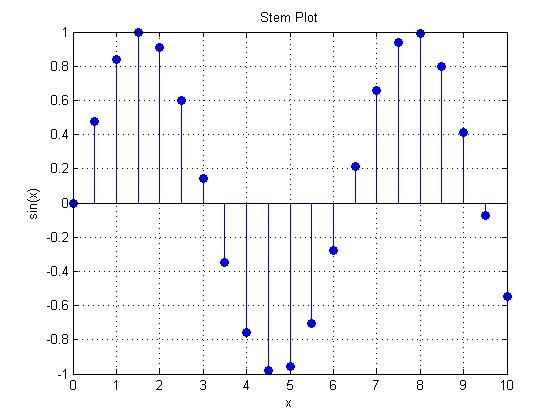
y = sin(x);

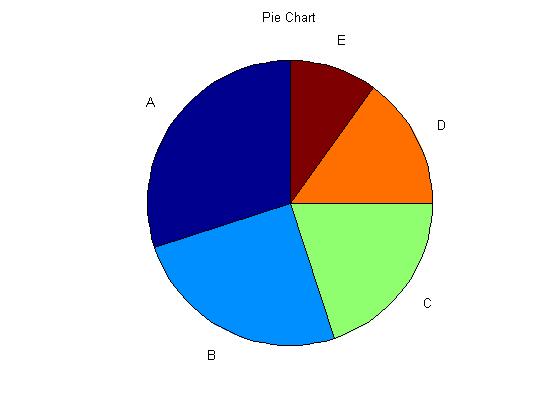
stem(x, y, 'filled');

title('Stem Plot');

xlabel('x'); ylabel('sin(x)');

grid on;





1. Pie Chart (Diagram Lingkaran)

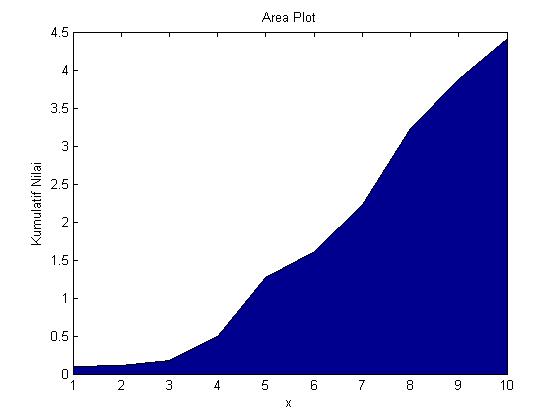
Code:

data = [30, 25, 20, 15, 10];

labels = {'A','B','C','D','E'};

pie(data, labels);

title('Pie Chart');



1. Area Plot (Diagram Luas)

Code:

x = 1:10;

y = cumsum(rand(1,10));

area(x, y);

title('Area Plot');

xlabel('x'); ylabel('Kumulatif Nilai');

1. Stairs Plot (Tangga Diskrit)

Code:

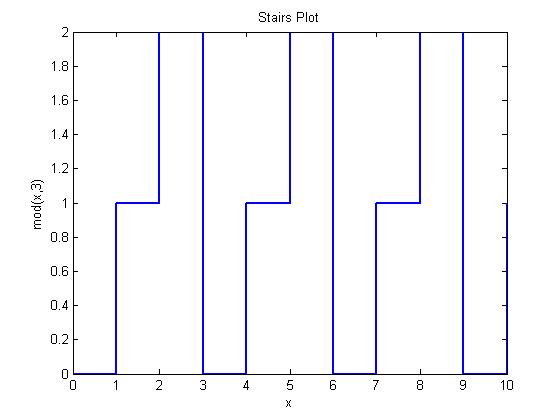
x = 0:10;

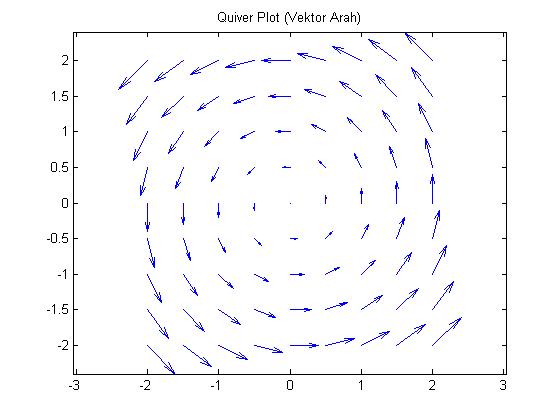
y = mod(x, 3);

stairs(x, y, 'LineWidth', 2);

title('Stairs Plot');

xlabel('x'); ylabel('mod(x,3)');





1. Quiver Plot (Vektor Panah 2D)

Code:

[x, y] = meshgrid(-2:0.5:2, -2:0.5:2);

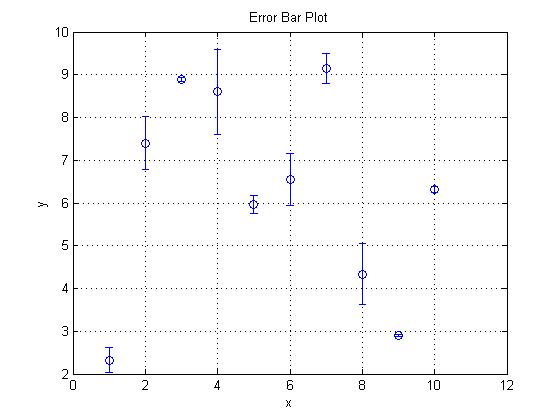
u = -y;

v = x;

quiver(x, y, u, v);

title('Quiver Plot (Vektor Arah)');

axis equal;

1. Error Bar Plot

Code:

x = 1:10;

y = rand(1,10)\*10;

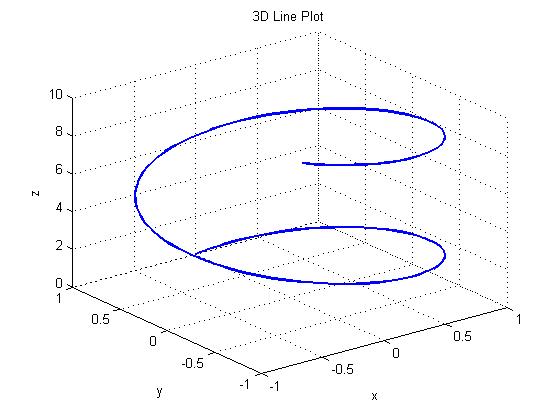
e = rand(1,10);

errorbar(x, y, e, 'o');

title('Error Bar Plot');

xlabel('x'); ylabel('y');

grid on;

1. 3D Line Plot

Code:

t = 0:0.1:10;

x = sin(t);

y = cos(t);

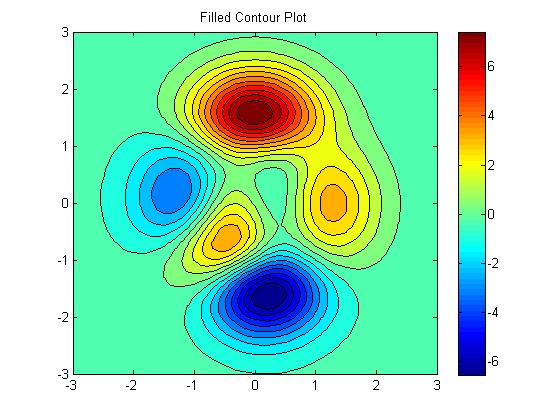
z = t;

plot3(x, y, z, 'LineWidth', 2);

title('3D Line Plot');

xlabel('x'); ylabel('y'); zlabel('z');

grid on;

1. Filled Contour Plot

Code:

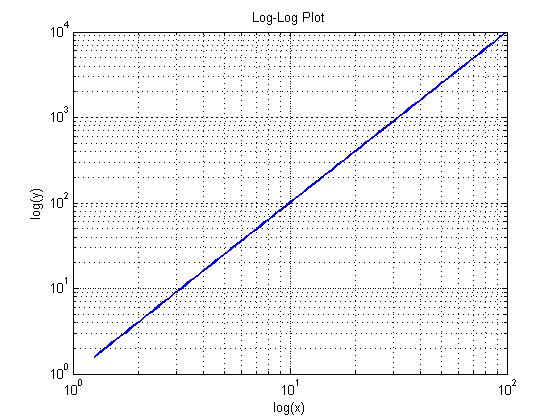
[x, y] = meshgrid(-3:0.1:3, -3:0.1:3);

z = peaks(x, y);

contourf(x, y, z, 20);

colorbar;

title('Filled Contour Plot');



1. Log-Log Plot

Code:

x = logspace(0.1, 2, 100);

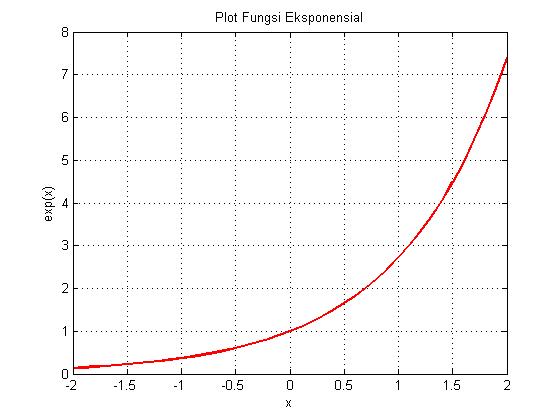
y = x.^2;

loglog(x, y, 'LineWidth', 2);

title('Log-Log Plot');

xlabel('log(x)'); ylabel('log(y)');

grid on;



1. Plot Fungsi Eksponensial

Code:

figure;

x = -2:0.1:2;

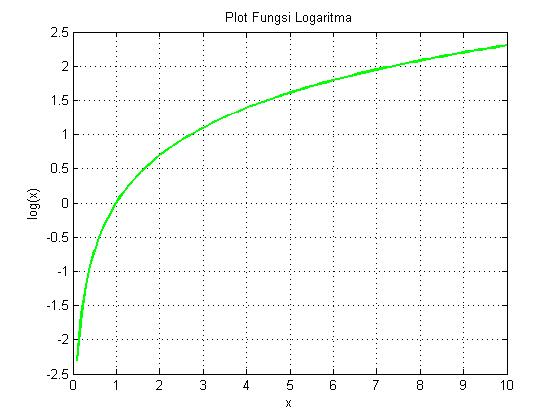
y = exp(x);

plot(x, y, 'r', 'LineWidth', 2);

title('Plot Fungsi Eksponensial');

xlabel('x'); ylabel('exp(x)');

grid on;



1. Plot Fungsi Logaritma

Code:

figure;

x = 0.1:0.1:10;

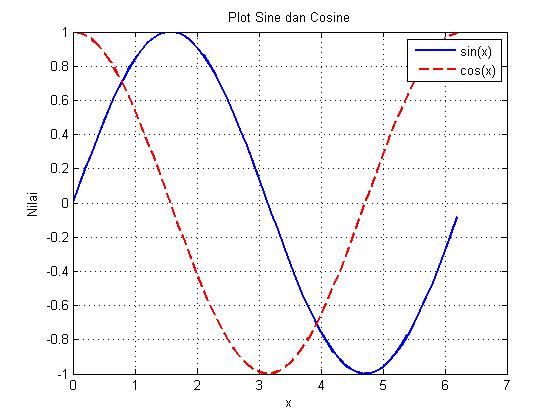
y = log(x);

plot(x, y, 'g', 'LineWidth', 2);

title('Plot Fungsi Logaritma');

xlabel('x'); ylabel('log(x)');

grid on;

1. Plot Cosine dan Sine Bersamaan

Code:

figure;

x = 0:0.1:2\*pi;

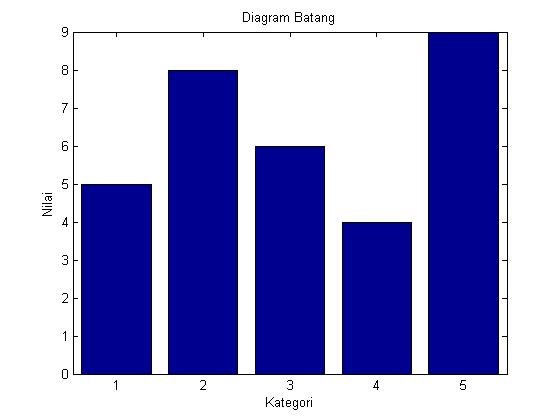
plot(x, sin(x), 'b', x, cos(x), 'r--', 'LineWidth', 2);

legend('sin(x)', 'cos(x)');

title('Plot Sine dan Cosine');

xlabel('x'); ylabel('Nilai');

grid on;



1. Bar Chart

Code:

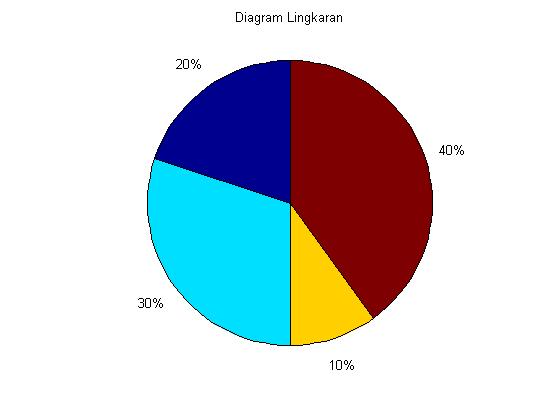
figure;

data = [5 8 6 4 9];

bar(data);

title('Diagram Batang');

xlabel('Kategori'); ylabel('Nilai');



1. Pie Chart

Code:

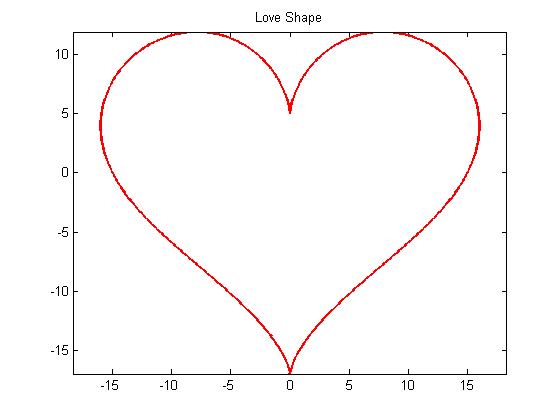
figure;

data = [20 30 10 40];

pie(data);

title('Diagram Lingkaran');

1. Love Shape

Code:

figure;

t = linspace(0, 2\*pi, 1000);

x = 16\*sin(t).^3;

y = 13\*cos(t) - 5\*cos(2\*t) - 2\*cos(3\*t) - cos(4\*t);

plot(x, y, 'r', 'LineWidth', 2);

axis equal;

title('Love Shape');

1. Butterfly Curve

Code:

figure;

t = linspace(0, 24\*pi, 10000);

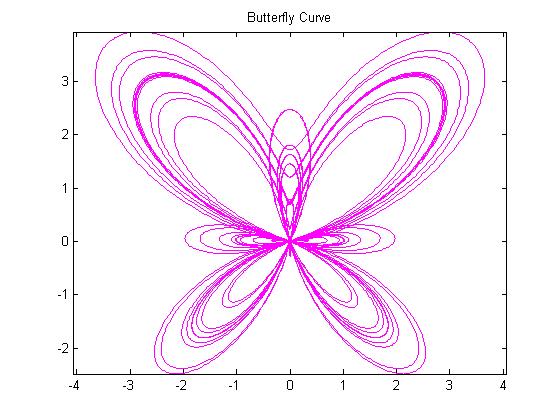
x = sin(t) .\* (exp(cos(t)) - 2\*cos(4\*t) - sin(t/12).^5);

y = cos(t) .\* (exp(cos(t)) - 2\*cos(4\*t) - sin(t/12).^5);

plot(x, y, 'm');

axis equal;

title('Butterfly Curve');



1. Bird Curve

Code:

figure;

t = linspace(-2\*pi, 2\*pi, 1000);

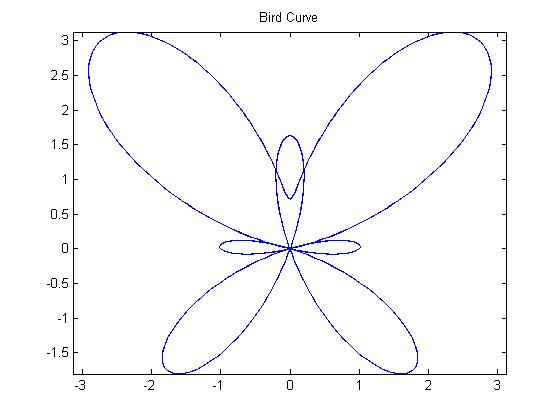
x = sin(t).\*(exp(cos(t)) - 2\*cos(4\*t));

y = cos(t).\*(exp(cos(t)) - 2\*cos(4\*t));

plot(x, y, 'b');

axis equal;

title('Bird Curve');



1. Leaf Curve

Code:

figure;

t = linspace(0, 2\*pi, 1000);

r = 1 - sin(t);

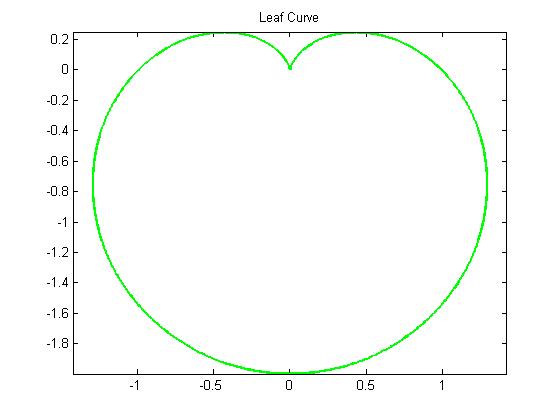
x = r .\* cos(t);

y = r .\* sin(t);

plot(x, y, 'g', 'LineWidth', 2);

axis equal;

title('Leaf Curve');



1. Heart Filled with Dots

Code:

figure;

t = linspace(0, 2\*pi, 1000);

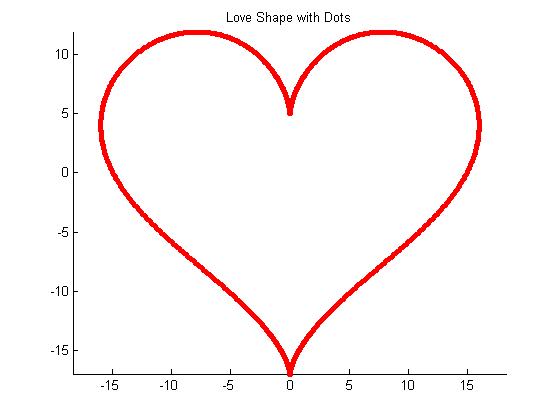
x = 16\*sin(t).^3;

y = 13\*cos(t) - 5\*cos(2\*t) - 2\*cos(3\*t) - cos(4\*t);

scatter(x, y, 10, 'r', 'filled'); % Gunakan titik-titik

axis equal;

title('Love Shape with Dots');



1. Line Plot with Confidence Bounds

Code:

figure;

% Data utama

x = 1:20;

y = sin(x/2) + 0.1\*x;

% Batas kepercayaan (misal: ±0.3)

lower = y - 0.3;

upper = y + 0.3;

% Gambar area batas kepercayaan dengan fill manual

hold on;

fill([x, fliplr(x)], [upper, fliplr(lower)], [0.9 0.9 0.9], 'EdgeColor', 'none'); % area abu-abu

plot(x, y, 'b', 'LineWidth', 2); % garis utama

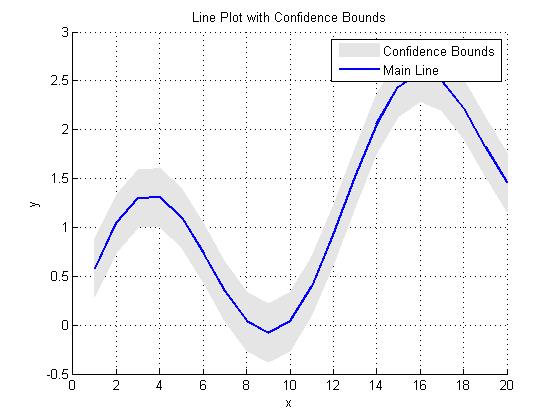
hold off;

title('Line Plot with Confidence Bounds');

xlabel('x'); ylabel('y');

legend('Confidence Bounds', 'Main Line');

grid on;



1. Plot Dates and Time

Code:

figure;

% Data tanggal (pakai format serial number MATLAB)

% Misalnya dari 1 Januari 2024 sampai 10 Januari 2024

tanggal = datenum(2024, 1, 1:10);

% Data nilai y

nilai = rand(1, 10) \* 10;

% Plot dengan sumbu x berbasis tanggal

plot(tanggal, nilai, '-o', 'LineWidth', 2);

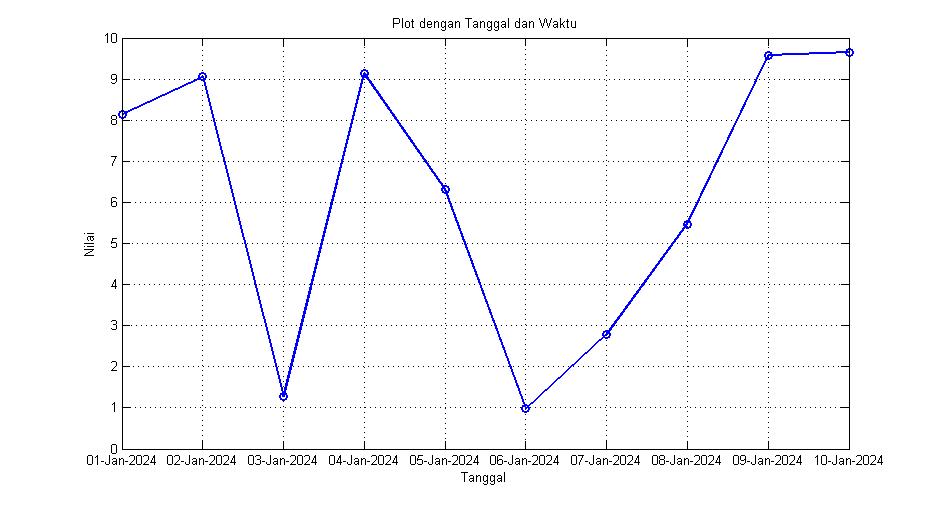
datetick('x', 'dd-mmm-yyyy', 'keepticks'); % Tampilkan format tanggal

xlabel('Tanggal');

ylabel('Nilai');

title('Plot dengan Tanggal dan Waktu');

grid on;



1. 3D Hat (Topi Meksiko)

Code:

figure;

[x, y] = meshgrid(-5:0.1:5, -5:0.1:5);

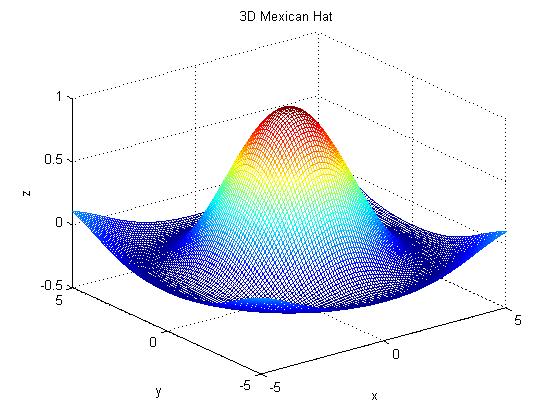
r = sqrt(x.^2 + y.^2) + eps;

z = sin(r)./r;

mesh(x, y, z); % gunakan mesh agar kompatibel

title('3D Mexican Hat');

xlabel('x'); ylabel('y'); zlabel('z');



1. 3D Ripple

Code:

figure;

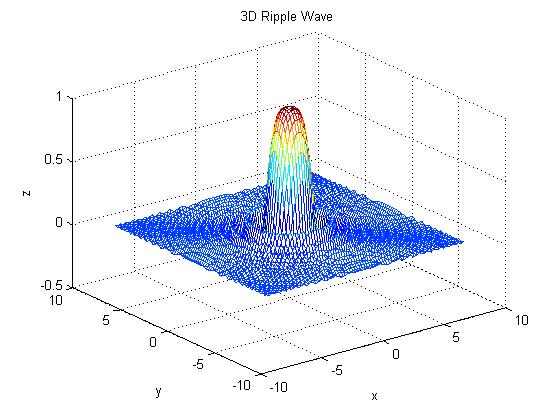
[x, y] = meshgrid(-8:0.2:8, -8:0.2:8);

z = sin(x.^2 + y.^2)./(x.^2 + y.^2 + eps);

mesh(x, y, z);

title('3D Ripple Wave');

xlabel('x'); ylabel('y'); zlabel('z');



1. 3D Mountain

Code:

figure;

[x, y] = meshgrid(-5:0.1:5, -5:0.1:5);

z = exp(-0.1\*(x.^2 + y.^2)) .\* cos(2\*x) .\* cos(2\*y);

mesh(x, y, z);

title('3D Mountain');

xlabel('x'); ylabel('y'); zlabel('z');

