LAPORAN PRAKTIKUM
METODE NUMERIK

Responsi 1: Galat, SPL, Pers. Non Linier

DISUSUN OLEH

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PROGRAM STUDI INFORMATIKA
FAKULTAS MIPA
UNIVERSITAS SEBELAS MARET
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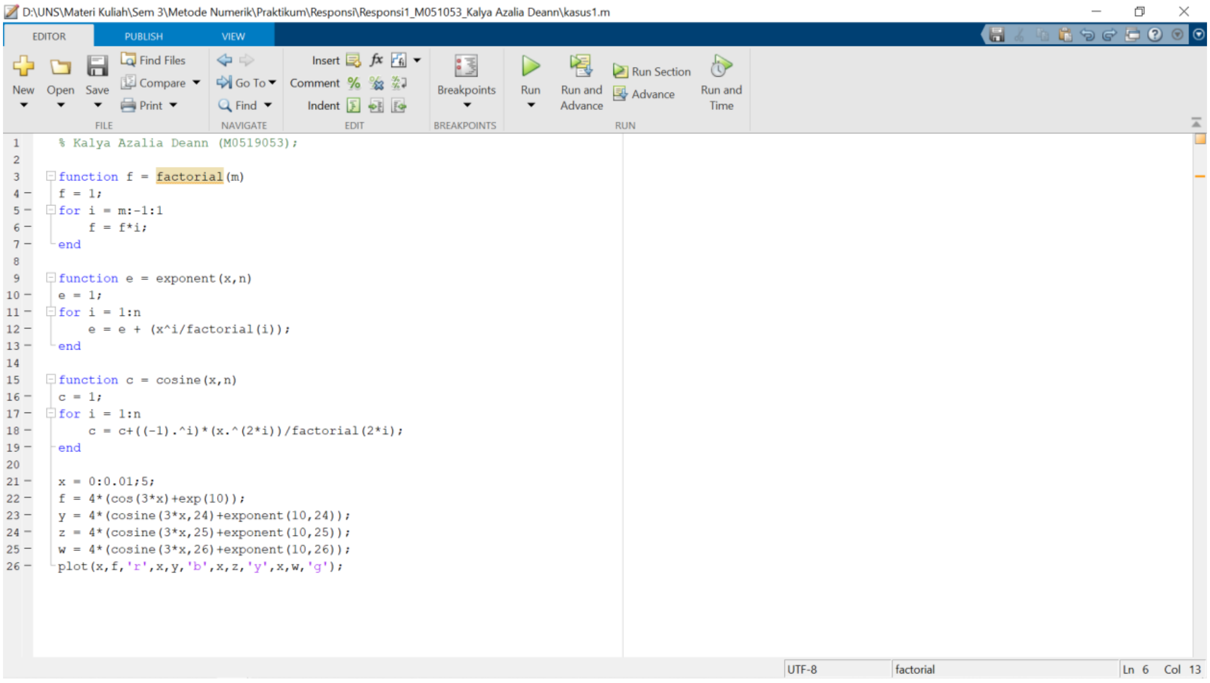
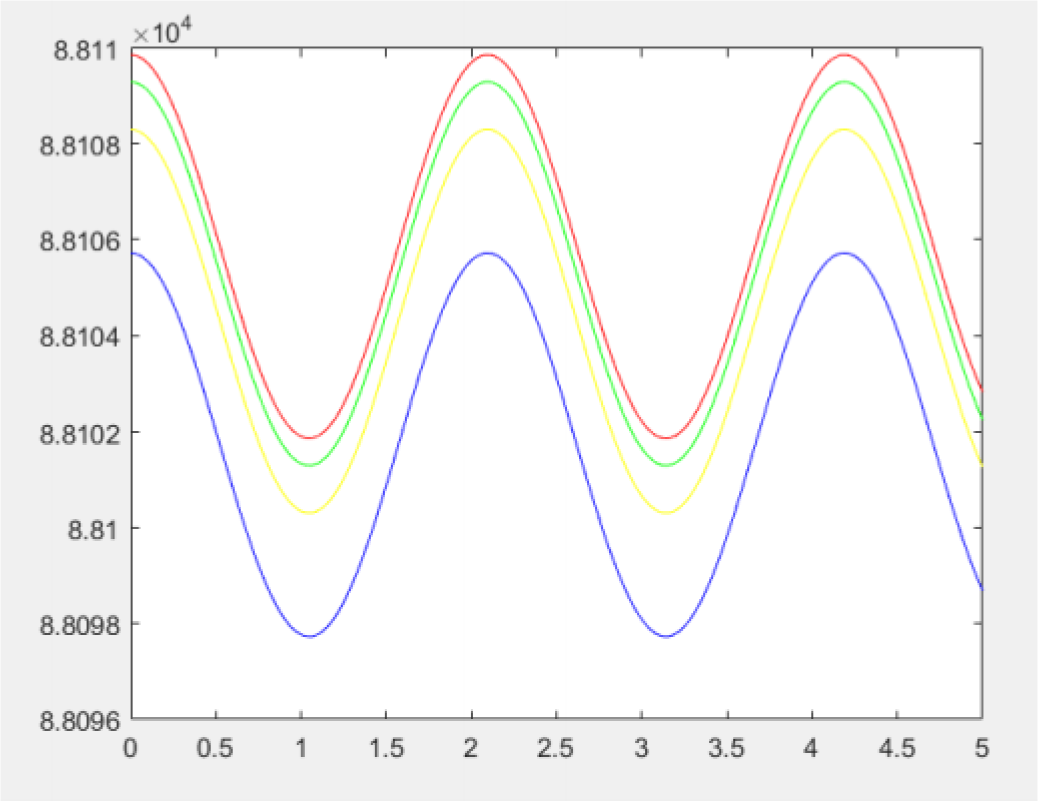
- Kasus 1

a. Source Code



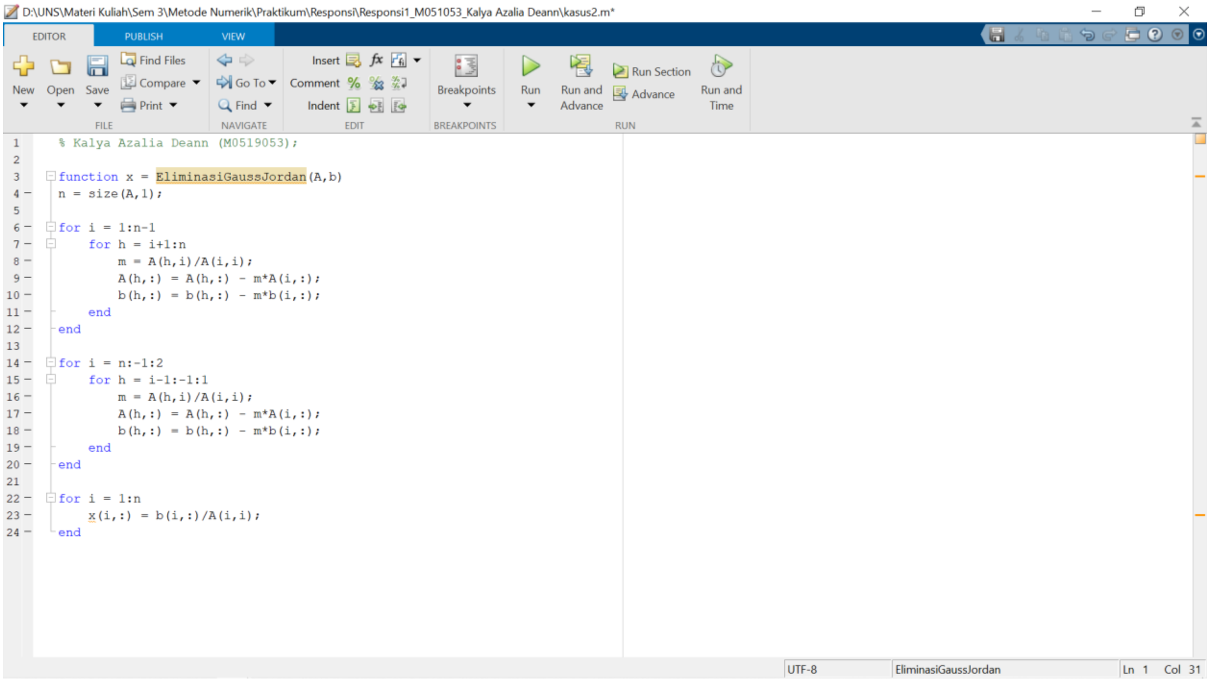
```
% Kalya Azalia Deann (M0519053);

function f = factorial(m)
f = 1;
for i = m:-1:1
    f = f*i;
end

function e = exponent(x,n)
e = 1;
for i = 1:n
    e = e + (x^i/factorial(i));
end

function c = cosine(x,n)
c = 1;
for i = 1:n
    c = c+((-1).^i)*(x.^(2*i))/factorial(2*i);
end

x = 0:0.01;5;
f = 4*(cos(3*x)+exp(10));
y = 4*(cosine(3*x,24)+exponent(10,24));
z = 4*(cosine(3*x,25)+exponent(10,25));
w = 4*(cosine(3*x,26)+exponent(10,26));
plot(x,f,'r',x,y,'b',x,z,'y',x,w,'g');
```

b. Output Program



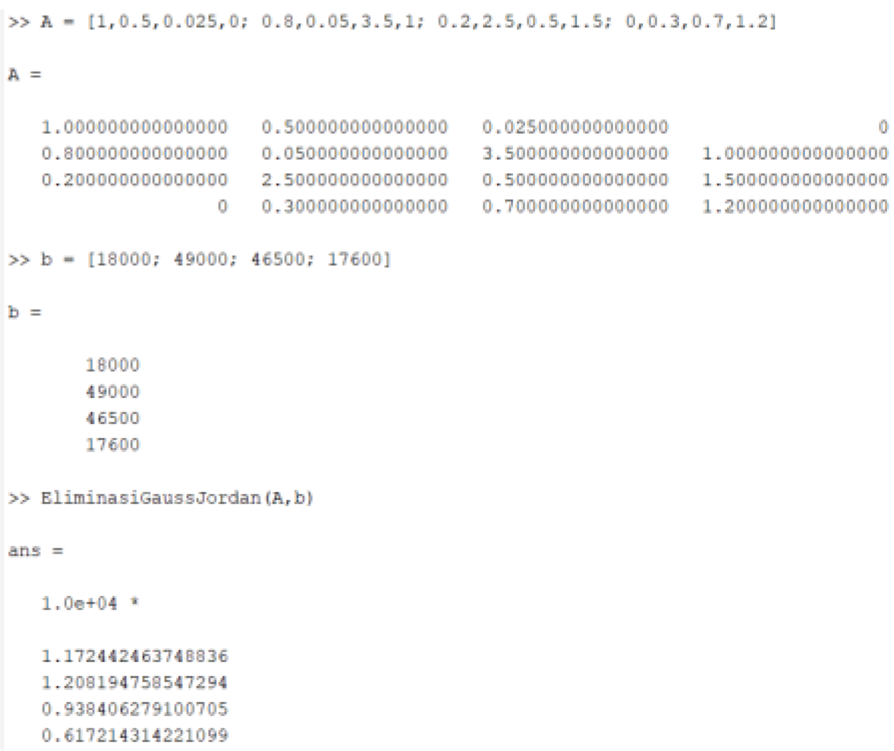
- Kasus 2

a. Source Code



```
 % Kalya Azalia Deann (M0519053);

function x = EliminasiGaussJordan(A,b)
n = size(A,1);

for i = 1:n-1
    for h = i+1:n
        m = A(h,i)/A(i,i);
        A(h,:) = A(h,:) - m*A(i,:);
        b(h,:) = b(h,:) - m*b(i,:);
    end
end

for i = n:-1:2
    for h = i-1:-1:1
        m = A(h,i)/A(i,i);
        A(h,:) = A(h,:) - m*A(i,:);
        b(h,:) = b(h,:) - m*b(i,:);
    end
end

for i = 1:n
    x(i,:) = b(i,:)/A(i,i);
end
```

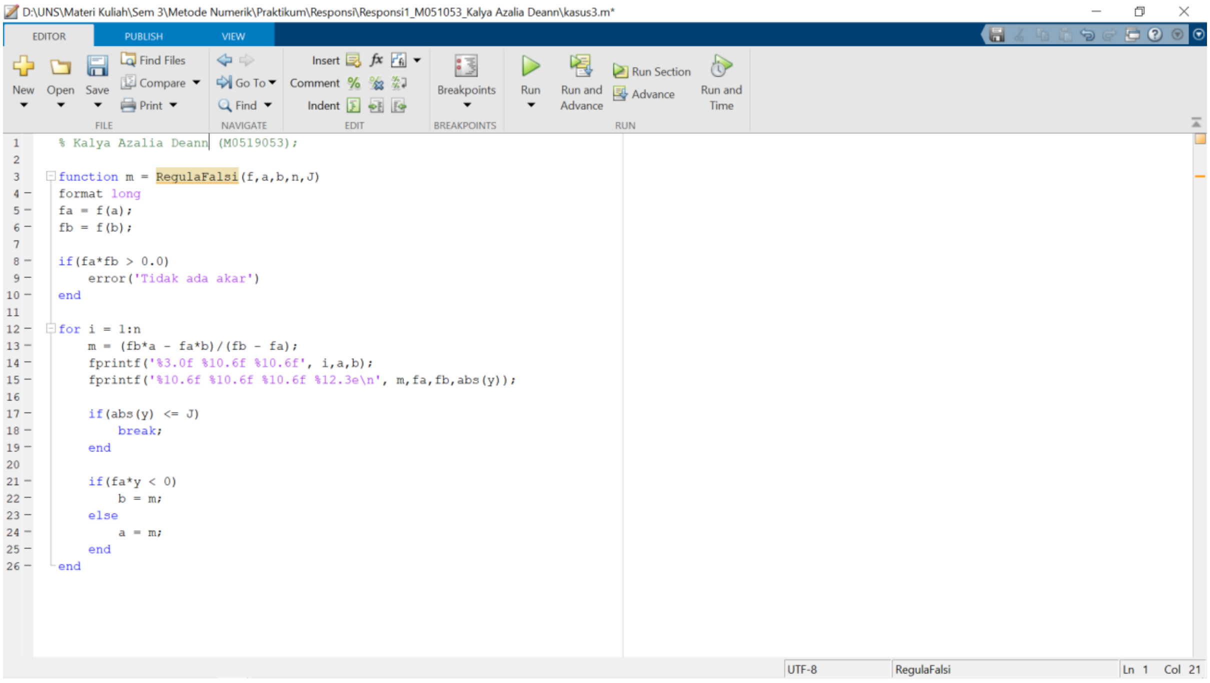
b. Output Program



```
>> A = [1,0.5,0.025,0; 0.8,0.05,3.5,1; 0.2,2.5,0.5,1.5; 0,0.3,0.7,1.2]

A =

   1.000000000000000   0.500000000000000   0.025000000000000                   0
   0.800000000000000   0.050000000000000   3.500000000000000   1.000000000000000
   0.200000000000000   2.500000000000000   0.500000000000000   1.500000000000000
                   0   0.300000000000000   0.700000000000000   1.200000000000000

>> b = [18000; 49000; 46500; 17600]

b =

       18000
       49000
       46500
       17600

>> EliminasiGaussJordan(A,b)

ans =

   1.0e+04 *

   1.172442463748836
   1.208194758547294
   0.938406279100705
   0.617214314221099
```

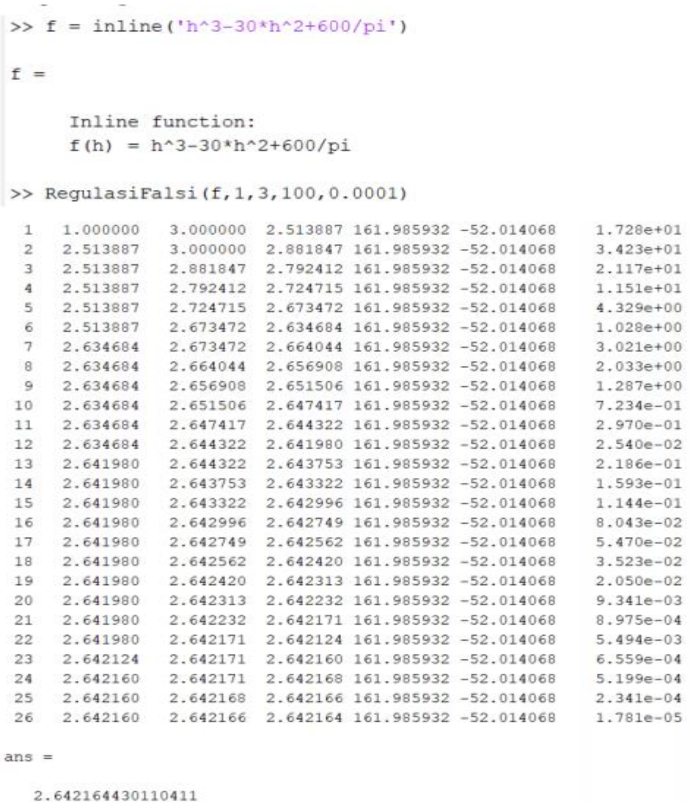
- Kasus 3

a. Source Code



```
% Kalya Azalia Deann (M0519053);

function m = RegulaFalsi(f,a,b,n,J)
format long
fa = f(a);
fb = f(b);

if(fa*fb > 0.0)
    error('Tidak ada akar')
end

for i = 1:n
    m = (fb*a - fa*b)/(fb - fa);
    fprintf('%3.0f %10.6f %10.6f', i,a,b);
    fprintf('%10.6f %10.6f %10.6f %12.3e\n', m,fa,fb,abs(y));

    if(abs(y) <= J)
        break;
    end

    if(fa*y < 0)
        b = m;
    else
        a = m;
    end
end
```

b. Output Program



```
>> f = inline('h^3-30*h^2+600/pi')

f =

     Inline function:
     f(h) = h^3-30*h^2+600/pi

>> RegulasiFalsi(f,1,3,100,0.0001)

  1   1.000000   3.000000  2.513887 161.985932 -52.014068   1.728e+01
  2   2.513887   3.000000  2.881847 161.985932 -52.014068   3.423e+01
  3   2.513887   2.881847  2.792412 161.985932 -52.014068   2.117e+01
  4   2.513887   2.792412  2.724715 161.985932 -52.014068   1.151e+01
  5   2.513887   2.724715  2.673472 161.985932 -52.014068   4.329e+00
  6   2.513887   2.673472  2.634684 161.985932 -52.014068   1.028e+00
  7   2.634684   2.673472  2.664044 161.985932 -52.014068   3.021e+00
  8   2.634684   2.664044  2.656908 161.985932 -52.014068   2.033e+00
  9   2.634684   2.656908  2.651506 161.985932 -52.014068   1.287e+00
 10   2.634684   2.651506  2.647417 161.985932 -52.014068   7.234e-01
 11   2.634684   2.647417  2.644322 161.985932 -52.014068   2.970e-01
 12   2.634684   2.644322  2.641980 161.985932 -52.014068   2.540e-02
 13   2.641980   2.644322  2.643753 161.985932 -52.014068   2.186e-01
 14   2.641980   2.643753  2.643322 161.985932 -52.014068   1.593e-01
 15   2.641980   2.643322  2.642996 161.985932 -52.014068   1.144e-01
 16   2.641980   2.642996  2.642749 161.985932 -52.014068   8.043e-02
 17   2.641980   2.642749  2.642562 161.985932 -52.014068   5.470e-02
 18   2.641980   2.642562  2.642420 161.985932 -52.014068   3.523e-02
 19   2.641980   2.642420  2.642313 161.985932 -52.014068   2.050e-02
 20   2.641980   2.642313  2.642232 161.985932 -52.014068   9.341e-03
 21   2.641980   2.642232  2.642171 161.985932 -52.014068   8.975e-04
 22   2.641980   2.642171  2.642124 161.985932 -52.014068   5.494e-03
 23   2.642124   2.642171  2.642160 161.985932 -52.014068   6.559e-04
 24   2.642160   2.642171  2.642168 161.985932 -52.014068   5.199e-04
 25   2.642160   2.642168  2.642166 161.985932 -52.014068   2.341e-04
 26   2.642160   2.642166  2.642164 161.985932 -52.014068   1.781e-05

ans =

    2.642164430110411
```