

KONKAN GYANPEETH COLLEGE OF ENGINEERING, KARIJAT

DEPARTMENT OF SCIENCE AND HUMANITIES

SCILAB PROGRAMS 1

Q.1 Use the Newton-Raphson method to find a root of the equation $x\sin x + \cos x = 0$.

INPUT:

```
clc;
deff('[y]=f(x)', 'y=x*sin(x) + cos(x)');
deff('[y]=fd(x)', 'y=x*cos(x)');
x=3.1416;
xx=0;
i=0;
eps=0.0001;
disp('By using Newton Raphson method');
disp('Roots:');
while(abs(x-xx)>=eps)
y=x-(f(x)/fd(x));
disp(y);
xx=x;
x=y;
i=i+1;
end
disp('No. of iterations:');
disp(i);
```

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SCILAB PROGRAMS 2

Q.2 Solve the system of equation by Gauss Elimination method

$$2x + 3y - z = 5$$

$$4x + 4y - 3z = 3$$

$$-2x + 3y - z = 1$$

INPUT:

```
clc;
```

```
A=[2 3 -1; 4 4 -3; -2 3 -1];
```

```
B=[5; 3; 1];
```

```
n=length(B);
```

```
Aug=[A,B];
```

```
for j=1:n-1
```

```
for i=j+1:n
```

```
Aug(i,j:n+1)=Aug(i,j:n+1)-Aug(i,j)/Aug(j,j)*Aug(j,j:n+1);
```

```
end
```

```
end
```

```
x=zeros(n,1);
```

```
x(n)=Aug(n,n+1)/Aug(n,n);
```

```
for i=n-1:-1:1
```

```
x(i)=(Aug(i,n+1)-Aug(i,i+1:n)*x(i+1:n))/Aug(i,i);
```

```
end
```

```
disp('By using Gauss Elimination method:');
```

```
disp(strcat(['x=',string(x(1))]));
```

```
disp(strcat(['y=',string(x(2))]));
```

```
disp(strcat(['z=',string(x(3))]));
```

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SCILAB PROGRAMS 3

Q.3 Solve the following system of equations by Gauss Seidel method $27x+6y-z=85$, $6x+15y+2z=72$,
 $x+y+54z=110$

INPUT:

```
clc
```

```
A=[27 6 -1 ; 6 15 2 ; 1 1 54];
```

```
b=[85; 72; 110];
```

```
i=[3.15; 3.54; 1.91];
```

```
for j=1:5
```

```
x1=((b(1)-A(1,2)*i(2))-(A(1,3)*i(3)))/A(1,1);
```

```
i(1)=x1;
```

```
x2=((b(2)-A(2,1)*i(1))-(A(2,3)*i(3)))/A(2,2);
```

```
i(2)=x2;
```

```
x3=((b(3)-A(3,1)*i(1))-(A(3,2)*i(2)))/A(3,3);
```

```
i(3)=x3;
```

```
end
```

```
disp(i);
```

Q.4 Solve $2x^3 - 2.5x - 5 = 0$ for the root in the interval [1,2] by Regula -Falsi method.

INPUT:

```
clc;
deff('[y]=f(x)','y=2*(x^3)-2.5*x-5');
a=1;
b=2;
c=0;
c1=1;
i=0;
eps=0.0001;
disp('By using Regula -falsi method:');
disp('Roots:');
while(abs(c-c1)>eps)
c=(a*f(b)-b*f(a))/(f(b)-f(a));
if(f(a)*f(c)<0)
b=c;
end
if(f(b)*f(c)<0)
a=c;
end
c1=(a*f(b)-b*f(a))/(f(b)-f(a));
i=i+1;
disp(c);
end
disp('No. of iterations:');
disp(i);
```