THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)

Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

Mat Lab

29 messages

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 3, 2022 at 8:59 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
b=[1 2 3
   4 5 6
   7 8 9]
c = [ 1,2,3,4,5,6,7,8,9]
b(3)
c(2:4)
b(:)
d=[1 2 3; 4 5 6; 7 8 9]
d(2,1)
d(2:3,2:3)%sub matrix
b(1:2, : )
```

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 3, 2022 at 8:59 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
% m=40
% if else structure
% m=input('enter the no')
% r = rem(m,2)
% if r==0
%     disp(' even')
%
% else
%     disp('not even') % /n to display in the next line
% end
```

[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 3, 2022 at 9:01 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
%while loop

%q=10
q=input('Enter the no')
while q>0
   q=q-1
end
disp(q)
```

[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 3, 2022 at 9:03 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

27th July

Format
Format long to get 16 decimal point
Format short back to 4 decimals
Function name (argument)- case sensitive
sqrt()
factorial()
exp()
F & f both are different
log() gives to the base of e
Iif we need base mention it

Eg log10()
We have to give angle in radians just type pi pre defined
sin()
cos()
For degree.
Use
sind()
Code()
help function name
help elfun - for elementary functions
rem(no, divisior)
abs()
Eg abs(-20) gives 20
Ans is variable store's results
Ans by default variable denoted by a
a=
The Last value of every variable gets stored
Operations follows bodmas
format compact to remove the spaces
format loose to get back spaces
To delete the variable - clear variable name - just clears the variables
Clear all to remove all variable from work space
clc to clear screen it can't clear the variables

who - to know the variables that are created
% to write the comments
; Supress the out put result result will not be displayed
disp(only one variable name) to display the results
disp('string') inverted command
fprintf(to print any no of variables and strings %f , variable name)
Matlab matrix laboratory
(Array) /row vector
%rowvector
b=[1 2 3]
b=[1 ,2 ,3]both are same .
b=[1 ;2; 3;] rows changes to coloum in output

Aug 3rd
Array
Arrayname(position)
Q=[1 2 3 5 6 7 8 9]
Q(3) gives 3
Q(2:4) gives 2 3 4
Q(:) gives all elements in coloum
Matrix
Matrixname(row no , coloum no)
(2:3,2:4)

[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 3, 2022 at 9:28 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
%bisection method to find out the roots
 x=0:10 % range of x 0 to 10
f=@(x) x.^4+x.^2-1 %function def f=@(varible) funcrtionname
                %for element wise operation use .   x.^4
  % t0 plot the graph of the function plot(x,y axis)
  plot(x,f(x) )
```

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Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 3, 2022 at 9:42 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
%bisection method to find out the roots
 x=0:10 % range of x 0 to 10
f=@(x) x.^2-4*x-2 %function def f=@(varible) funcrtionname
                %for element wise operation use .   x.^4
 % t0 plot the graph of the function plot(x,y axis)
 plot(x,f(x) )
 % from graph range of x roots lie between 0 to 4
 tol=10^(-4)
 a=0
 b=4
 c=(a+b)/2
 v=abs(f(c))
```

[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Sat, Aug 13, 2022 at 1:39 PM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

Quadratic code

```
% find roots of quadratic equation a*x^2 + b*x + c
a=1; b=5; c=6;
root1= (-b + sqrt(b^2 - 4*a*c))/(2*a);
root2= (-b - sqrt(b^2 - 4*a*c))/(2*a);

%disp('Root 1 is');
%disp(root1);
%disp('Root 2 is');
%disp(root2);

%fprintf('Root 1 is %f and Root 2 is %f', root1, root2)
m=1; n=2;
fprintf('Root %d is %f and Root %d is %f', m, root1, n, root2)
```

[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 24, 2022 at 9:09 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

24th aug

```
clc
clear
f=@(x)x^3+4*x^2-10;
%g =@(x) x-x^3-4*x^2+10; converg
%g = @(x) ((10/x)-4*x)^(1/2); error
%g = @(x) 0.5*(10-x^3)^(1/2); error
%g= @(x) (10/4+x)^(1/2); coverg
g =@(x) x-(
syms x;
gl=diff(g(x));
x=0:0.01:2;
for i = 1:length(x)
    if abs(subs(gl,x(i)))<1
        continue
    else
        fprintf('Given g(x) does not  converges to fixed point');
        break
    end
end
if i == length(x)
    disp('given g(x) converges to fixed point')
end
```

[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 24, 2022 at 9:21 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
f=@(x) 2*sin(pi)*x+x; % x=g(X)
g=@(x) -2*sin(pi)*x;
tol = 10^(-2);
xo=1;
N=10;
i=1;
while(i<=N)
   x1=g(xo);
   if abs(x1-xo)<tol
      fprintf('root is %d',x1)
      break
   end
   i =i+1;
   xo=x1;
end
```

[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 31, 2022 at 5:57 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

Aug 17th

2

```
clc
clear all
%Fixed point iteration
%fixed point is domain becomed image i.e. g(x)=x
% eg: g(x)=x^2 x^2=x fixed point is 0 and 1
% g(x) ka fixed point aayega if |g'(x)|<1

syms x; % to find derivative define variable
f=@(x) x^3+4*x^2-10;
g=@(x) x-x^3-4*x^2+10;

x=0:0.01:2
%%k(x)=g'(x)
%k=@(x) 1-3*x^2-8*x;
g1= diff(g(x))

if abs(g1(x))<1
   fprintf('Given g(x) converge to x')
else
   fprintf('Given g(x) does not converge to x')
end
```

1

```
clc
clear all
% Bisection Method

%x=0:10 %values of x in array to plot function

%for element wise operation use dot
f=@(x) x^2-4*x-2; %defining function

%plot(x,f(x)) %to get range

tol= 10^(-4);
a=0; %root range from graph
b=5;
```

```
if f(a)*f(b)>0
   disp('Wrong values of a and b')
else
   c=(a+b)/2; %calculating mid point

   while abs(f(c))>tol
      if f(a)*f(c)<0
         b=c;
      else
         a=c;
      end
      c=(a+b)/2;
   end
end

fprintf('Root is %f', c)
```
[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 31, 2022 at 8:35 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
f=@(x) tan(x)-(4*x); % x=g(X)
g=@(x) (tan(x))/4;
%g=@(x) atan(4*x);

tol = 10^(-2);
xo=1;
N=10;
i=1;
while(i<=N) %n =10 for max itrations ; max itrations 1 to 10;
   x1=g(xo);
   if abs(x1-xo)<tol
      fprintf('root is %f',x1)
      break
   end
   i =i+1;
   xo=x1;
end
if i== N
   fprint('change g(x)')
end
```
[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 31, 2022 at 9:14 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
% newtons method
clc
clear all
%m = y2-y1/x2-x1 tan eq ; slope is its derivative
clc
clear all
syms x
f=@(x) cos(x)-x*exp(x);
df =inline(diff(f(x))) ;% it becomes a poi8nt after using inline

tol = 10^(-5);
xo=1;
N=10;
i=1;
while(i<=N) %n =10 for max itrations ; max itrations 1 to 10;
   x1= xo-(f(xo)/df(xo));
   if abs(x1-xo)<tol
      fprintf('root is %f',x1)
      break
   end
```

```
    i =i+1;
    xo=x1;
end
if i== N
    fprint('root not found ') %V
end
```

On Wed, Aug 31, 2022 at 9:13 AM Sai Nikhil Mashetti <smashetti_be21@thapar.edu> wrote:

```
% newtons method
clc
clear all
%m = y2-y1/x2-x1 tan eq ; slope is its derivative
clc
clear all
syms x
f=@(x) cos(x)-x*exp(x);
df =inline(diff(f(x))) ;% it becomes a poi8nt after using inline

tol = 10^(-5);
xo=1;
N=10;
i=1;
while(i<=N) %n =10 for max itrations ; max itrations 1 to 10;
    x1= xo-(f(xo)/df(xo));
    if abs(x1-xo)<tol
        fprintf('root is %f',x1)
        break
    end
    i =i+1;
    xo=x1;
end
if i== N
    fprint('change g(x)')
end
```

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Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 31, 2022 at 9:36 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
% newtons method
clc
clear all
%m = y2-y1/x2-x1 tan eq ; slope is its derivative
clc
clear all
syms x
%f=@(x) cos(x)-x*exp(x);%xo=1;
%f=@(x) sin(x)-cos(x)+(1/2); %xo=1;
%f=@(x) exp(-x)*(x^2+5*x+2)+1;%xo=-1,-2;
%f=@(x) 2*sin(x)-x ; % tol is 10^-3 ;N=20
f=@(x) 4*x^2 -exp(x)-exp(-x) % tol 10^-5
df =inline(diff(f(x))) ;% it becomes a poi8nt after using inline

tol = 10^(-5);
%tol = 10^(-3);
%xo=1;
%xo=1;
%xo=-2.0;
%xo=-1.0;
xo=1;
%N=10;
%N=20;
N = 10;
i=1;
while(i<=N) %n =10 for max itrations ; max itrations 1 to 10;
    x1= xo-(f(xo)/df(xo));
    if abs(x1-xo)<tol
        fprintf('root is %f',x1)
```

```
        break
    end
    i =i+1;
    xo=x1;
end
if i== N
    fprint('root not found ')
end
```
[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Aug 31, 2022 at 9:45 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
%secant method
clc
clear all
syms x

f=@(x) x-17^(0.5);
df =inline(diff(f(x))) ;% it becomes a poi8nt after using inline


tol = 10^(-3);

xo=1;
x1=1;
N = 10;
i=1;
while(i<=N) %n =10 for max itrations ; max itrations 1 to 10;
    x2= x1 -(((x1-xo)/f(x1)-f(xo))*f(xo))
    if abs(x1-xo)<tol
        fprintf('root is %f',x1)
        break
    end
    i =i+1;
    xo=x1;
    x1=x2;
end
if i== N
    fprint('root not found ')
end
error
```
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Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Sep 7, 2022 at 9:18 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
Matrix
clc
clear all
% matrix LU factorization A=LU ;l = low tri and u is upper tri
% ONE OF THE MATRIX MUST HAVE 1 IN THE DIAGIONAL IN L & U MATRIX
%EG L = [1 0 0;A 1 0;B C 1] AND U = [A B C; 0 D E ;0 0 K]
%1 WAY ASSUME L AND U AND MULTIPLY LU QAND COMP WITH GIVEN A
%2ND METHOD
%L21=A12/A11 (DIGO ELEMENT ).....
%2 FOR LOOPS SINCE ROW AND COL IS PRESENT
% TO GET SIZE OF MATRIX USE size(a,1) give no of rows a(a,2) give no of col
% size(a) give no of col & row
%for id matrix use eye(enter the size of matrix )eg eye (3)
%l =eye(size(a,1))
%a(i,:) to exc on all the rows


A =[ 1/3 1/2 -1/4; 1/5 2/3 3/8 ;2/3 -2/3 5/8 ]
%A= [2 -1 1; 3 3 9;3 3 5]

 L = eye(size(A,1))
```

```
 for j =1: size(A,2)
    for i = j+1 :size(A,1)
       L(i,j)=A(i,j)/A(j,j)
       A(i,:)=A(i,:)-L(i,j)*A(j,:)
    end
 end
L
A
```

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Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Sep 14, 2022 at 10:29 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

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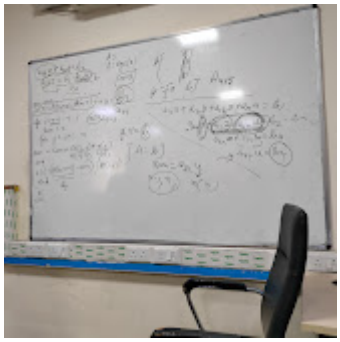
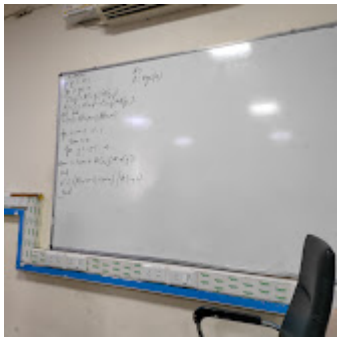
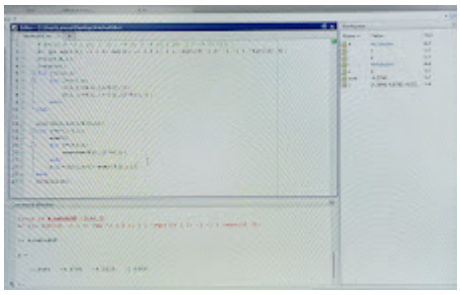
3 attachments



IMG20220914091335.jpg
4013K



IMG20220914082530.jpg
3811K



IMG20220914085316.jpg
9705K

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Oct 12, 2022 at 9:21 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
%gauss sedel
clear all ;
A = [4.63 -1.21 3.22 ; -3.07 5.48 2.11 ; 1.26 3.11 4.57 ];
B = [2.22 -3.17 5.11 ] ;
Xo= [0 0 0] ; % old values of x
X = [0 0 0] ; % new values of x are replaced new values of x
tol = 10^(-3);
max =100;
k=0;
n =size(A,1);
while (k<=max)
 k=k+1;
```

```
for i = 1:n
   sum1 =0;
   sum2 =0;% sum1 ,2should be in the loop
for j =1:i-1
   sum1=sum1+A(i,j)*X(j);
end
for j=i+1:n
   sum2=sum2+A(i,j)*Xo(j);
end
X(i)=(B(i)-sum1-sum2)/A(i,i) ;
if (norm(Xo-X)<tol);
   disp(X(j));
   break
   end
Xo=X
end
end
disp(X)
```
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Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Oct 12, 2022 at 9:25 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
%SOR
clear all ;
A = [4.63 -1.21 3.22 ; -3.07 5.48 2.11 ; 1.26 3.11 4.57 ];
B = [2.22 -3.17 5.11 ] ;
Xo= [0 0 0] ; % old values of x
X = [0 0 0] ; % new values of x are replaced new values of x
tol = 10^(-3);
max =100;
k=0;
n =size(A,1);
W =1.2;
while (k<=max)
 k=k+1;
for i = 1:n
   sum1 =0;
   sum2 =0;% sum1 ,2should be in the loop
for j =1:i-1
   sum1=sum1+A(i,j)*X(j);
end
for j=i+1:n
   sum2=sum2+A(i,j)*Xo(j);
end
%X(i)=(B(i)-sum1-sum2)/A(i,i) ;
X(i)=(1-W)*Xo(i)+W*((B(i)-sum1-sum2)/A(i,i)) ;
if (norm(Xo-X)<tol);
   disp(X(j));
   break
   end
Xo=X
end
end
disp(X)
```
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Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Oct 12, 2022 at 9:32 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
%SOR
clear all ;
A = [4 1 -1 1 ; 1 4 -1 -1 ; -1 -1 5 1; 1 -1 1 3 ];
B = [-2 -1 0 1 ]' ;
Xo= [0 0 0 0 ] ; % old values of x
X = [0 0 0 0 ] ; % new values of x are replaced new values of x
```

[Quoted text hidden]
A\B %TO CHECK THE ANS CLOSENESS NOT / USE \ AND TAKE THE TRANS OF B
[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Oct 19, 2022 at 8:54 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
%power method
A = [ 4 1 0 ; 1 20 1 ; 0 1 4] ;
tol = 10^(-3) ;
Xo = [1 1 1]' ;
K1= 500 ;
z=0;
maxi =100 ;
while (z<=maxi)
   z = z+1 ;
   Y = A*Xo ;
   K = max(abs(Y));
   X = (1/K)*Y;
   if abs(K-K1)<tol
      break
   end
   Xo=X
   K1=K
end
disp(K1)
disp(Xo)
```

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Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Oct 19, 2022 at 9:01 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
%power method
A = [ 1 1 0 0 ; 1 2 0 1 ; 0 0 3 3; 0 1 2 3] ;
tol = 10^(-3) ;
Xo = [1 1 0 1]' ;
K1= 500 ;
z=0;
maxi = 3 ;
while (z<=maxi)
   z = z+1 ;
   Y = A*Xo ;
   K = max(abs(Y));
   X = (1/K)*Y;
   if abs(K-K1)<tol
      break
   end
   Xo=X
   K1=K
end
disp(K1)
disp(Xo)
```

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Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Oct 19, 2022 at 9:33 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
%Langrange interpolation
n= 4;
X =[ 0 0.25 0.5 0.75 ] ;
p = 0.43 ;
```

```
F = [1 1.64872 2.71828 4.48169] ;
for i =1 : n %: is to
    l(i) =1.0;
    for j=1 : n
        if j ~= i %~= is not equal to
            l(i) = ((p -X(j))/(X(i)-X(j)))*l(i);
        end
    end
end
    SUM =0.0
    for i =1 : n
        SUM =SUM+l(i)*F(i)
    end
    disp(SUM)
```
[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Oct 19, 2022 at 9:38 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
%Langrange interpolation
n= 4;
X =[ 1950 1960 1970 1980 1990 2000 ] ;

p = 1995;%19195,1975
F = [151326 179323 203302 226542 249633 281422] ;
```
[Quoted text hidden]
[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Nov 9, 2022 at 9:24 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
%newton divided difference interpolation
% order of matrix =no of values given
%n is the lengthg of x
%:, all rows
% ,: all col in matrix ; : TO
 x =[1 1.5 2.0 2.5] ;
 f =[2.7183 4.4817 7.3891 12.1825] ;
%DD= [0 0 0 0 ; 0 0 0 0; 0 0 0 0; 0 0 0 0] ; DD gives matrix
 n = length(x);
 DD = zeros(n);

 i= 0;
 j=0;
 DD(:,1)=f;
 for j =2:n
     for i =j:n;
         DD(i,j)= (DD(i,j-1)-DD(i-1,j-1))/(x(i)-x(i-j+1))
     end
 end

 p = 2.25
 sum= 0;
 Product = 1;
 pro = [0 0 0 0];
 for i=1:n
     pro(i)=1;
     for j=1:i-1

     pro(i) =(p-x(j))*pro(i);
     end
 end
 for i=1:n
     sum =sum+pro(i)*DD(i,i);
```

```
 end
sum
pro
```
[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Nov 9, 2022 at 9:30 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
%newton divided difference interpolation
% order of matrix =no of values given
%n is the lengthg of x
%:, all rows
% ,: all col in matrix ; : TO
 x =[0 0.25 0.5 0.75] ;
 f =[1 1.64872 2.71828 4.4816] ;
%DD= [0 0 0 0 ; 0 0 0 0; 0 0 0 0; 0 0 0 0] ; DD gives matrix
 n = length(x);
 DD = zeros(n);

 i= 0;
 j=0;
 DD(:,1)=f;
 for j =2:n
     for i =j:n;
         DD(i,j)= (DD(i,j-1)-DD(i-1,j-1))/(x(i)-x(i-j+1))
     end
 end

 p = 0.43
 sum= 0;
 Product = 1;
 pro = [0 0 0 ];
 for i=1:n
     pro(i)=1;
     for j=1:i-1

     pro(i) =(p-x(j))*pro(i);
     end
 end
 for i=1:n
     sum =sum+pro(i)*DD(i,i);
 end
sum
pro
```
[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Nov 16, 2022 at 8:46 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
f=@(x) cos(x)^(2); %tarpezoidal
N=6;
a=-0.25;
b=0.25;
h=(b-a)/N;
sum=0;

for i= 1:N-1
    x=a+h*i;
    sum=sum+2*f(x);
end
sum =sum+f(a)+f(b);
ans=sum*(h/2)
```
[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Nov 16, 2022 at 8:51 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
%f=@(x) cos(x)^(2);
%trapezoidal
f=@(x) exp(x^(-2))*cos(x);
N=4;
a=-0.25;
b=0.25;
h=(b-a)/N;
sum=0;

for i= 1:N-1
   x=a+h*i;
   sum=sum+2*f(x);
end
sum =sum+f(a)+f(b);
ans=sum*(h/2)
```

[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Nov 16, 2022 at 9:06 AM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

```
clc
clear all
%f=@(x) cos(x)^(2);
%Simpson
f=@(x) exp(-x^(2))*cos(x);
N=4;
a=-1;
b=1;
h=(b-a)/N;
sum=0;

for i= 1:N-1
   x=a+h*i;
   if rem(i,2)==0
   sum=sum+2*f(x);
   else
      sum=sum+4*f(x);
   end
end
sum =sum+f(a)+f(b);
ans=sum*(h/3)
```

[Quoted text hidden]

Sai Nikhil Mashetti <smashetti_be21@thapar.edu> Wed, Nov 16, 2022 at 9:28 PM
To: Sai Nikhil Mashetti <smashetti_be21@thapar.edu>

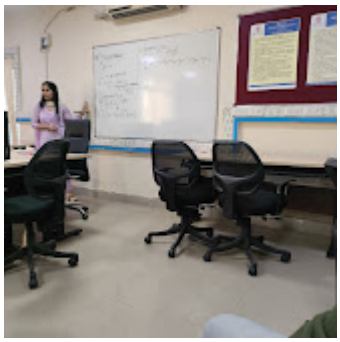
```
%RK Method
clc
clear all
f= @(t,y) (-y+2*cos(t));
a= 0;
b= 1;
t(1)= a;
y(1)= 1;
h= 0.2;
N= (b-a)/h;
for i=1:N
   t(i+1)= t(i)+h;
   k1= h* f(t(i),y(i));
```

```
    k2= h* f(t(i)+h/2,y(i)+k1/2);
    k3= h* f(t(i)+h/2,y(i)+k2/2);
    k4= h* f(t(i)+h,y(i)+k3);
    y(i+1)= y(i)+(k1+2*k2+2*k3+k4)/6;
end
y
```

```
%Modified Euler
clc
clear all
f= @(t,y) (-y+2*cos(t));
a= 0;
b= 1;
t(1)= a;
y(1)= 1;
h= 0.2;
N= (b-a)/h;
for i=1:N
    t(i+1)= t(i)+h;
    k1= h* f(t(i),y(i));
    k2= h* f(t(i)+h,y(i)+k1);
    y(i+1)= y(i)+(k1+k2)/2;
end
y
```

---

4 attachments



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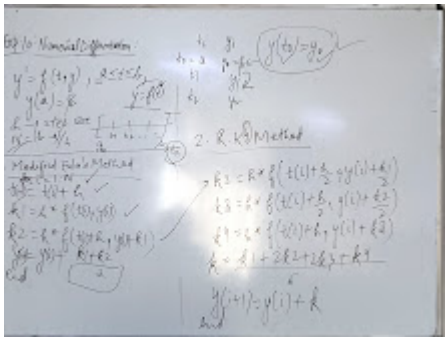

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