Contents


```
function [count,taylor,diff]=PS08_taylor_cos_fu194(numIn,tol)
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ENGR 132
% Program Description
% using taylor formula to calculate approximate value of cos.
%
%Function Call
% [count,taylor,diff]=PS08_taylor_cos_fu194(numIn,tol)
%
% Input Arguments
% double numIn - num input for calculate cos
% double tol - tolerance of the last term
% Output Arguments
% double taylor - approximate cos result calculated
% int count - number of terms
% double diff - difference between the calculated approximat cos and real
% value
%
% Assignment Information
%   Assignment:         PS 08, Problem 2
%   Author:             Yuefan Fu, fu194@purdue.edu
%   Team ID:            001-05
%       Contributor:            Name, login@purdue [repeat for each]
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

INITIALIZATION

```
%initialize default output value
taylor=-99;
count=-99;
diff=-99;
```

CALCULATIONS

```
dem=size(numIn);
if(dem(1)~=1||dem(2)~=1)%check if is Scaler
```

```
    fprintf('error: invalid x');
    return;
elseif(tol<=0||tol>=1)%check tolerence
    fprintf('error: invalid tolerance')
    return;
else
    taylor=0;
    count=0;
    %calculate approxmate cos
    while(abs((-1)^(count)*numIn^(2*count)/factorial(count*2))>tol)
        taylor=taylor+(-1)^(count)*numIn^(2*count)/factorial(count*2);
        count=count+1;
        %fprintf('%.4f\n',taylor);
    end
    %calculate difference
    diff=abs(cos(numIn)-taylor);
end
```

COMMAND WINDOW OUTPUT

```
%[x,y,z]=PS08_taylor_cos_fu194(2,0.001)
%x =
%     5
%y =
%   -0.4159
%z =
%   2.7382e-04

%[x,y,z]=PS08_taylor_cos_fu194(pi,0.001)
%x =
%     7
%y =
%   -0.9999
%z =
%   1.0047e-04
```

ACADEMIC INTEGRITY STATEMENT

I/We have not used source code obtained from any other unauthorized source, either modified or unmodified. Neither have I/we provided access to my/our code to another. The project I/we am/are submitting is my/our own original work.

```
end
```

```
x =
     5
y =
   -0.4159
z =
   2.7382e-04
```

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