```
clear;close all;clc;
```

```
% Exercise 1-1
a = (4.*7 - 8) / (3^4 -1)
```

```
a = 0.2500
```

```
b = exp((sin(3.2)))
```

```
b = 0.9433
```

```
c = (5 + log(37/2.9.*1.7)) / 9
```

```
c = 0.8974
```

```
% Exercise 1-2
A = [3 5 1;2 0 1;-1 1 0];
B = [-2,1,-4]';
C = inv(A) *B
```

```
C = 3×1
    2.8333
   -1.1667
   -4.6667
```

```
% Exercise 1-3
L1 = (-3:0.1:5)
```

```
L1 = 1×81
   -3.0000   -2.9000   -2.8000   -2.7000   -2.6000   -2.5000   -2.4000   -2.3000 ···
```

```
% Exercise 1-4
L2 = 10 .^ (-3:1:5)
```

```
L2 = 1×9
10^5 ×
    0.0000    0.0000    0.0000    0.0000    0.0001    0.0010    0.0100    0.1000 ···
```

```
% Exercise 1-5
syms k
symsum(k.*(101-k),1,100)
```

```
ans = 171700
```

```
u = 1:100;
v = 100:-1:1;
u * v'
```

```
ans = 171700
```

```
% Exercise 1-6
A = rand(5,6);
B = A(A > 0.3 & A < 0.7)
```

```
B = 12×1
    0.6948
    0.3171
    0.4387
    0.3816
    0.4898
    0.4456
    0.6463
    0.6797
    0.6551
    0.4984
     ⋮
```

```
% Exercise 1-7
A = zeros(4,4);
B = ones(4,3);
C = cat(2,A,B)
```

```
C = 4×7
     0     0     0     0     1     1     1
     0     0     0     0     1     1     1
     0     0     0     0     1     1     1
     0     0     0     0     1     1     1
```

```
% Exercise 1-8
A = [3 2 0; -5 6 1; 1 0 2];
index = find(A)
```

```
index = 7×1
     1
     2
     3
     4
     5
     8
     9
```

```
[row,col] = find(A == 0 )
```

```
row = 2×1
     3
     1
col = 2×1
     2
     3
```

```
% Exercise 1-9
A = [1 25 7 20; 8 90 30 18;
    12 23 15 176; 50 0 31 9];
col = [1;0;2;8];
```

```
A = [A col]
```

```
A = 4×5
     1    25     7    20     1
     8    90    30    18     0
    12    23    15   176     2
    50     0    31     9     8
```

```
[r,c] = size(A);
r+c
```

```
ans = 9
```

```
B = A(2:4,1:2:5)
```

```
B = 3×3
     8    30     0
    12    15     2
    50    31     8
```

```
c = A;
c(2:2:4,:)
```

```
ans = 2×5
     8    90    30    18     0
    50     0    31     9     8
```

```
A = reshape(A,[5,4])
```

```
A = 5×4
     1    90    15     9
     8    23    31     1
    12     0    20     0
    50     7    18     2
    25    30   176     8
```

```
mean(A,1)
```

```
ans = 1×4
   19.2000   30.0000   52.0000    4.0000
```

```
mean(A,2)
```

```
ans = 5×1
   28.7500
   15.7500
    8.0000
   19.2500
   59.7500
```

```
mean(mean(A))
```

```
ans = 26.3000
```

```
A(1) = nan;
A(end) = nan;
A
```

```
A = 5×4
   NaN    90    15     9
```

```
     8    23    31     1
    12     0    20     0
    50     7    18     2
    25    30   176   NaN
```

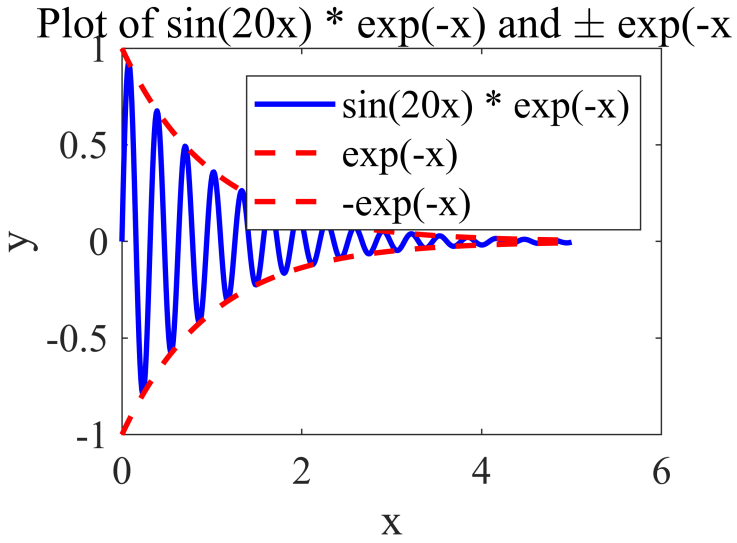
```
mean(mean(A))
```

```
ans = NaN
```

```
% Exercise 2
x = linspace(0, 5, 500);
y1 = sin(20*x) .* exp(-x);
y2 = exp(-x);
y3 = -exp(-x);
figure;
plot(x, y1, 'b-', 'LineWidth', 2);
hold on;
plot(x, y2, 'r--', 'LineWidth', 2);
plot(x, y3, 'r--', 'LineWidth', 2);


title('Plot of sin(20x) * exp(-x) and \pm exp(-x)', 'FontSize', 15, 'FontName',
'Times New Roman');
xlabel('x', 'FontSize', 15, 'FontName', 'Times New Roman');
ylabel('y', 'FontSize', 15, 'FontName', 'Times New Roman');
legend('sin(20x) * exp(-x)', 'exp(-x)', '-exp(-x)', 'FontSize', 15, 'FontName',
'Times New Roman');

set(gca, 'FontSize', 15, 'FontName', 'Times New Roman');
```




```
% Exercise 4
x = linspace(-0.8, 0.8, 500);
y = linspace(-0.8, 0.8, 500);
```

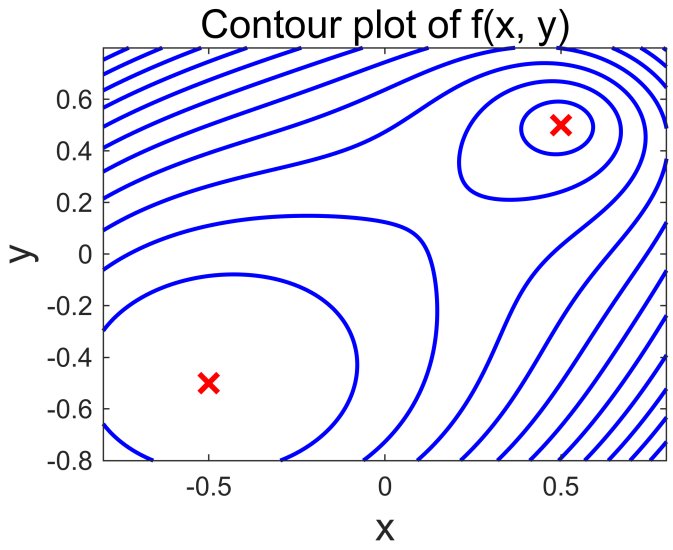
```
[X, Y] = meshgrid(x, y);

Z = sqrt((X - 0.5).^2 + (Y - 0.5).^2) .* ((X + 0.5).^2 + (Y + 0.5).^2);
figure;
contour(X, Y, Z, 'LineColor', 'b', 'LineWidth', 1.5);
hold on;

plot(0.5, 0.5, 'rx', 'MarkerSize', 10, 'LineWidth', 2);
plot(-0.5, -0.5, 'rx', 'MarkerSize', 10, 'LineWidth', 2);

xlabel('x', 'FontSize', 15);
ylabel('y', 'FontSize', 15);
title('Contour plot of f(x, y)', 'FontSize', 15);

hold off;
```




```
%Exercise 3
```

```
function result = Cal_Euclidean(u,v)
    for i = 1:length(u)
        results  = results + (u(i)-v(i))^2;
    end
    result = sqrt(results);
end
```