

# MATLAB CODES:

## %mean

```
n=input("enter the length: ");
sum=0;
x=[];
for i=1:n
    x(i)=input("enter the xi ");
    sum=sum+x(i);
end
mean=sum/n;
disp(mean);
```

## %groupedmean

```
n=input("enter the obs: ");
sum=0;
q=0;
x=[];
f=[];
for i=1:n
    x(i)=input("enter xi ");
    f(i)=input("enter freq: ");
    sum=sum+x(i)*f(i);
    q=q+f(i);
end
mean=sum/q;
disp(mean);
```

## %mediansimple

```
n=input("enetr the obs: ");
x=[];
for i=1:n
    x(i)=input("enter the xi: ");
end
y=sort(x);
z=mod(n,2);
for i=1:n
    if(z==1)
        median=x((n+1)/2);
    else
        median=(x(n/2)+x((n+2)/2))/2;
    end
end
disp(median);
```

## %discretemedianwithfreq

```
n=input("enter the obs: ");
x=[];
f=[];
for i=1:n
```

```

        x(i)=input("enter the xi: ");
        f(i)=input("enter the freq: ");
    end
    p(1)=f(1)
    for i=2:n
        p(i)=f(i)+p(i-1);
    end
    N=p(n);
    pos=1;
    for i=1:n
        if p(i)<(N+1)/2
            pos=pos+1;
        else
            break;
        end
    end
    median=x(pos);
    disp(median);

```

### %groupeddatamedian

```

n=input("enter the obs: ");
l=input("enter the lowerlimit: ");
h=input("enter the size: ");
x(1)=l(1);
for i=2:n
    x(i)=x(i-1)+h;
end
for i=1:n
    f(i)=input("enter the freqs: ");
end
p(1)=f(1);
for i=2:n
    p(i)=f(i)+p(i-1);
end
N=p(n);
pos=1;
for i=1:n
    if p(i)<N/2
        pos=pos+1;
    else
        break;
    end
end
a=p(pos-1);
b=f(pos);
c=N/2;
d=x(i);
median=d+((c-a)/b)*h;
dispc(median);

```

### %StandardDeviation

```

n=input("Enter the obs: ");
l=input("Enter lowerlimit: ");
u=input("Enter upperlimit: ");
h=u-l;

```

```

m=h/2;
sumf=0;
sum=0;
sums=0;
for i=1:n
    x(i)=l+m+(i-1)*h;
end
for i=1:n
    f(i)=input("Enter the frequency: ");
end
for i=1:n
    sum=sum+f(i)*x(i);
    sumf=sumf+f(i);
end
ans=sum/sumf;
for i=1:n
    sums =sums+ f(i)*(x(i)-ans)*(x(i)-ans);
end
std=sqrt(sums/sumf);
disp(std);

```

### %StdDev-allcases:

```

disp("Press 1 for Normal Observations.")
disp("Press 2 for Discrete.")
disp("Press 3 for Cumulative.")
x = input('');

switch(x)
    case '1'
        y = input('Enter the number of observations (N): ');
        s = 0;
        a = zeros(1, y);
        for i = 1:y
            a(i) = input('Enter element: ');
            s = s + a(i);
        end
        mean = s / y;
        d = 0;
        for i = 1:y
            d = d + ((a(i) - mean) * (a(i) - mean));
        end
        d = d / y;
        disp("S.D.=");
        disp(sqrt(d))

    case '2'
        y = input('Enter the number of observations (N): ');
        s = 0;
        s1 = 0;
        a = zeros(1, y);
        b = zeros(1, y);
        for i = 1:y
            a(i) = input('Enter element: ');
            b(i) = input('Enter frequency: ');
            s = s + a(i) * b(i);
            s1 = s1 + b(i);
        end

```

```

end
d = 0;
mean = s / s1;
for i = 1:y
    d = d + b(i) * (((a(i) - mean) * (a(i) - mean)));
end
d = d / s1;
disp("S.D.=");
disp(sqrt(d));

case '3'
y = input('Enter the number of observations (N): ');
s = 0;
s1 = 0;
a = zeros(1, y);
b = zeros(1, y);
f = zeros(1, y);
for i = 1:y
    a(i) = input('Enter element class start: ');
    b(i) = input('Enter element class end: ');
    f(i) = input('Enter F element: ');
    s = s + ((a(i) + b(i)) / 2) * f(i);
    s1 = s1 + f(i);
end
mean = s / s1;
d = 0;
disp(mean);
for i = 1:y
    d = d + f(i) * (((a(i) + b(i)) / 2) - mean) * (((a(i) + b(i)) / 2) -
mean));
end
d = d / s1;
disp("S.D.=");
disp(sqrt(d));

otherwise
    disp("Invalid choice.")
end

```

## %Normaldistribution

```

n=input("enter n: ");
sum=0;
for i=1:n
    x(i)=input("Enter x: ");
    sum=sum+x(i);
end
mean=sum/n;
d=0;
for i=1:n
    d=d+((x(i)-mean)*(x(i)-mean));
end
m=d / n;
disp(sqrt(m));

```

### %Discrete

```
n=input("enter n: ");
sum=0;
sumxf=0;
for i=1:n
    x(i)=input("Enter x: ");
    f(i)=input("enter freq: ");
    sum=sum+f(i);
    sumxf=sumxf+x(i)*f(i);
end
mean=sumxf/sum;
d=0;
for i=1:n
    d=d+f(i)*((x(i)-mean)*(x(i)-mean));
end
m=d / sum;
disp(sqrt(m));
```

### %Cumulative

```
n=input("enter n: ");
sum=0;
sumxf=0;
for i=1:n
    a(i)=input("enter start: ");
    b(i)=input("enter final: ");
    f(i)=input("enter freq: ");
    sum=sum+f(i);
    sumxf=sumxf+((a(i)+b(i))/2)*f(i);
end
mean=sumxf/sum;
d=0;
for i=1:n
    d=d+f(i)*(((a(i)+b(i))/2)-mean)*(((a(i)+b(i))/2)-mean));
end
m=d /sum;
disp(sqrt(m));
```

### %karlpearsoncoefficient

```
n=input("enter the obs: ");
sumx=0;
sumy=0;
sumxy=0;
sumxx=0;
sumyy=0;
for i=1:n
    x(i)=input("enter the x: ");
    y(i)=input("enter the y: ");
    sumx=sumx+x(i);
    sumy=sumy+y(i);
    sumxy=sumxy+x(i)*y(i);
    sumxx=sumxx+x(i)*x(i);
    sumyy=sumyy+y(i)*y(i);
end
kpc=((n*sumxy)-(sumx*sumy))/(sqrt(n*sumxx-sumx*sumx)*sqrt(n*sumyy-sumy*sumy));
```

```
disp(kpc);
```

### %Spearman\_tiedRanks

```
n = input("enter the obs: ");
x = [];
y = [];
rx=[];
ry=[];
for i = 1:n
    x(i) = input("Enter the x: ");
    y(i) = input("Enter the y: ");
end

a=sort(x);
b=sort(y);
e=0;
AF=0;

for i=1:n
    c=0;
    d=0;
    for j=1:n
        if(x(i)==a(j))
            c=c+j;
            d=d+1;
        end
    end
    rx(i)=c/d;
    AF=AF+(d*(d*d-1));
    c=0;
    d=0;
    for j=1:n
        if(y(i)==b(j))
            c=c+j;
            d=d+1;
        end
    end
    ry(i)=c/d;
    e=e+(rx(i)-ry(i))*(rx(i)-ry(i));
    AF=AF+(d*(d*d-1));
end

AF=AF/12;
spc=(1-(6*e + AF)/(n*(n*n-1)));
disp(spc)
```

### %Spearman\_UntiedRanks

```
n = input("enter the obs: ");
x = [];
y = [];

for i = 1:n
    x(i) = input("Enter the x: ");
```

```

        y(i) = input("Enter the y: ");
    end
    e = sort(x);
    f = sort(y);
    w = 0;

    for i = 1:n
        a = find(e == x(i));
        b = find(f == y(i));
        o = (a - b) * (a - b);
        w = w + o;
    end

    N = (n * (n * n - 1));
    r = 1 - (6 * w) / N;

    disp(r);

```

### %curvefitting\_polynomial

```

n=input("enter the obs: ");
for i=1:n
    x(i)=input("enter the x: ");
    y(i)=input("enter the y: ");
end
sumx=0;
sumy=0;
sumxy=0;
sumxxxy=0;
sumxx=0;
sumxxx=0;
sumxxxx=0;
for i=1:n
    sumx=sumx+x(i);
    sumy=sumy+y(i);
    sumxy=sumxy+x(i)*y(i);
    sumxxxy=sumxxxy+x(i)*x(i)*y(i);
    sumxx=sumxx+x(i)*x(i);
    sumxxx=sumxxx+x(i)*x(i)*x(i);
    sumxxxx=sumxxxx+x(i)*x(i)*x(i)*x(i);
end
mat=[sumxx sumx n sumy;sumxxx sumxx sumx sumxy;sumxxxx sumxxx sumxx sumxy];
rmat=rref(mat);
a=rmat(1,4);
b=rmat(2,4);
c=rmat(3,4);
Y=a*x.^2+b*x+c;
fprintf("%f x^2 + %f x + %f ",a,b,c);
plot(x,Y);

```

### %linearregression(direct:y=ax+b)

```

n=input("enter the obs: ");
for i=1:n

```

```

        x(i)=input("enter the x: ");
        y(i)=input("enter the y: ");
    end
    sumy=0;
    sumx=0;
    sumxx=0;
    sumxy=0;
    for i=1:n
        sumx=sumx+x(i);
        sumy=sumy+y(i);
        sumxx=sumxx+x(i)*x(i);
        sumxy=sumxy+x(i)*y(i);
    end
    b=((n*sumxy-sumx*sumy)/(n*sumxx-sumx*sumx));
    a=((sumy-b*sumx)/n);
    Y=b*x+a;
    fprintf("%f x + %f ",b,a);
    plot(x,Y)

```

### %linearregression(y=ax+b)

```

n = input("Enter number of observations :");
x=[];
y=[];
sumx = 0;
sumxx = 0;
sumy = 0;
sumxy = 0;
for i=1:n
    x(i) = input("Enter x:");
    sumx= sumx + x(i);
    sumxx = sumxx + x(i)*x(i);
    y(i) = input("Enter y:");
    sumy = sumy + y(i);
    sumxy = sumxy + x(i)*y(i);
end
mat=[n sumx sumy;sumx sumxx sumxy];
rmat=rref(mat);
a=rmat(2,3);
b=rmat(1,3);
Y=a*x+b;
fprintf("%fx + %f",a,b);
plot(x,Y)

```

### %QuadraticEquation

```

a=input("enter a: ");
b=input("enter b: ");
c=input("enter c: ");
d=b*b-4*a*c;
if(d>0)
    r1=(-b+sqrt(d)/2*a);
    r2=(-b-sqrt(d)/2*a);
    fprintf("The roots are real and distinct: %f , %f",r1,r2);
end
if(d==0)

```



```

        r=(-b/2*a);
        fprintf("The roots are equal: %f ",r);
end
if(d<0)
    s=(-b)/(2*a);
    f=abs(d);
    i1=f/(2*a);
    fprintf("%f + %fi\n",s,i1);
    r=(-b)/(2*a);
    i2=f/(2*a);
    fprintf("%f - %fi\n",r,i2);
    fprintf("The roots are imaginary");
end

```

### %BarGraph

```

students=categorical({'s1','s2','s3','s4','s5','s6','s7','s8','s9','s10'})
marks=[12,89,45,66,78,34,12,45,76,69];
bar(students,marks,'Facecolor','r','BarWidth',0.6)
grid on

xlabel("Students")
ylabel("Marks")
title("Results 2023")

```

### %Z-test

```

x=[15,18, 25, 30, 38, 45, 54, 68]
[h, p, ci, zval] = ztest(x, 75, 10)    %(x,mean,std.dev)
histfit(x)
X label ('Grade')
Y label ('Frequency')

```

### %T-test

```

x=[15,18, 25, 30, 38, 45, 54, 68]
[h, p, ci, zval] = ttest(x);
histfit(x)
X label ('Grade')
Y label ('Frequency')

```