



**Ganpat  
University**

॥ विद्यया समाजोत्कर्षः ॥

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## -----PRACTICAL 03-----

### pdf&cdf&mean&variance

#### ✓ **Source Code :**

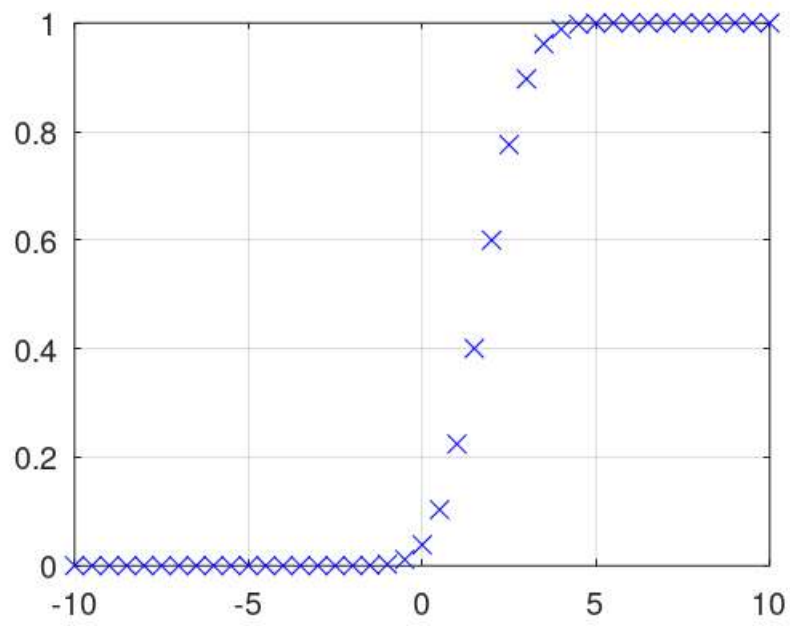
```
clc;
close all;
clear all;
u = 2; s = 1;
dx = 0.5;
x=-10:dx:10;
%to compute PDF
for i = 1:length(x)
    pd(i) = (1 / (s * sqrt(2 * pi))) * e^(-0.5 * ((x(i) - u) / s)^2)
    pdf(i) = pd(i) * dx
endfor

sum(pdf)
plot(x, pd, "r*");
%to compute CDF
cdf(1) = pdf(1);

for j = 2:length(x)
    cdf(j) = pdf(j) + cdf(j - 1)
endfor

sum(pdf)
sum(cdf)
plot(x, cdf, "bx")
%mean
M = sum(x .* pdf)
%variance
V = sum((x.^2) .* pdf) - M^2
```

✓ **Output :**



## 1. Write user defined function to calculate pdf2cdf.

### ✓ Source Code (fn\_cdf.m) :

```
function [cdf] = fn_cdf(u, s, x, dx)
    u = input("");
    s = input("");
    dx = input("");
    x = input("");

    for i = 1:length(x)
        pd(i) = (1 / (s * sqrt(2 * pi))) * e^(-0.5 * ((x(i) - u) / s)^2)
        pdf(i) = pd(i) * dx
    endfor

    fn_cdf(1) = pdf(1);

    for j = 2:length(x)
        fn_cdf(j) = pdf(j) + fn_cdf(j - 1)
    endfor

    sum(fn_cdf)
endfunction
```

### ✓ Output :

```
fn_cdf =
Columns 1 through 9:
    1.0732e-32    3.8316e-30    1.0632e-27    2.2983e-25    3.8703e-23    5.0777e-21    5.1907e-19    4.1350e-17
Columns 10 through 18:
    1.2428e-13    4.6916e-12    1.3817e-10    3.1761e-09    5.7025e-08    8.0038e-07    8.7923e-06    7.5707e-05
Columns 19 through 27:
    2.7280e-03    1.1492e-02    3.8488e-02    1.0325e-01    2.2423e-01    4.0026e-01    5.9974e-01    7.7577e-01
Columns 28 through 36:
    9.6151e-01    9.8851e-01    9.9727e-01    9.9949e-01    9.9992e-01    9.9999e-01    1.0000e+00    1.0000e+00
Columns 37 through 41:
    1.0000e+00    1.0000e+00    1.0000e+00    1.0000e+00    1.0000e+00
ans = 17
>> fn_cdf
```

## 2. Write user defined function to calculate pdf2mean.

### ✓ Source Code (fn\_mean.m) :

```
% QUESTION 3.2
function [mean] = fn_mean
    u = input("");
    s = input("");
    dx = input("");
    x = input("");

    for i = 1:length(x)
        pd(i) = (1 / (s * sqrt(2 * pi))) * e^(-0.5 * ((x(i) - u) /
s)^2)
        pdf(i) = pd(i) * dx
    endfor

    M = sum(x .* pdf)
endfunction
```

### ✓ Output :

```
pdf =
Columns 1 through 8:
    1.0732e-32    3.8208e-30    1.0594e-27    2.2877e-25    3.8473e-23    5.0390e-21    5.1399e-19    4.0831e-17
Columns 9 through 16:
    2.5261e-15    1.2172e-13    4.5674e-12    1.3348e-10    3.0379e-09    5.3849e-08    7.4336e-07    7.9919e-06
Columns 17 through 24:
    6.6915e-05    4.3634e-04    2.2159e-03    8.7642e-03    2.6995e-02    6.4759e-02    1.2099e-01    1.7603e-01
Columns 25 through 32:
    1.9947e-01    1.7603e-01    1.2099e-01    6.4759e-02    2.6995e-02    8.7642e-03    2.2159e-03    4.3634e-04
Columns 33 through 40:
    6.6915e-05    7.9919e-06    7.4336e-07    5.3849e-08    3.0379e-09    1.3348e-10    4.5674e-12    1.2172e-13
Column 41:
    2.5261e-15
M = 2.0000
>> fn_mean
```

### 3. Write user defined function to calculate pdf2var.

#### ✓ Source Code (fn\_mean.m) :

```
function [variance] = fn_varience(u, s, dx, x)
    u = input("");
    s = input("");
    dx = input("");
    x = input("");

    for i = 1:length(x)
        pd(i) = (1 / (s * sqrt(2 * pi))) * e^(-0.5 * ((x(i) - u) /
s)^2)
        pdf(i) = pd(i) * dx
    endfor

    fn_varience = sum((x.^2) .* pdf) - sum(x .* pdf)^2
endfunction
```

#### ✓ Output :

```
pdf =
Columns 1 through 8:
    1.0732e-32    3.8208e-30    1.0594e-27    2.2877e-25    3.8473e-23    5.0390e-21    5.1399e-19    4.0831e-17
Columns 9 through 16:
    2.5261e-15    1.2172e-13    4.5674e-12    1.3348e-10    3.0379e-09    5.3849e-08    7.4336e-07    7.9919e-06
Columns 17 through 24:
    6.6915e-05    4.3634e-04    2.2159e-03    8.7642e-03    2.6995e-02    6.4759e-02    1.2099e-01    1.7603e-01
Columns 25 through 32:
    1.9947e-01    1.7603e-01    1.2099e-01    6.4759e-02    2.6995e-02    8.7642e-03    2.2159e-03    4.3634e-04
Columns 33 through 40:
    6.6915e-05    7.9919e-06    7.4336e-07    5.3849e-08    3.0379e-09    1.3348e-10    4.5674e-12    1.2172e-13
Column 41:
    2.5261e-15
fn_varience = 1.0000
>>
```