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```
clear, clc, warning('off'), close all
```

Question 10

```
%{
You are given a data set consisting of 200 entries. Determine the best
fit
using chi square testing. Check for Nakagami, gamma, Weibull if the
data
set is completely positive. If data set contains negative values, test
for
normal or Laplacian. Laplacian is not a built in pdf in Matlab. To
get the
parameters of the Laplacian, simply find the mean and variance as
indicated
in HW#4. [You will see that a file named HW4_data_shankar_Spring. You
will
see your name (last name only) at the top of the column. You are
required
to use the data in that column].
%}

data = xlsread("HW6_data_shankar_Spring(1).xlsx", 1, "CF:CF");
datasort = sort(data);

[p, i] = ksdensity(datasort, 'NumPoints', 200);
figure;
grid on;
hold on;
plot(i, p, 'k*');

w = fitdist(datasort, 'Weibull'); % Weibull Probability Distribution
wei = pdf('Weibull', i, w.A, w.B);
[h,p,stats] = chi2gof(datasort, 'CDF', w)
plot(i, wei, '--');

n = fitdist(datasort, 'Nakagami'); % Nakagami Probability Distribution
nak = pdf('Nakagami', i, n.mu, n.omega);
[h,p,stats] = chi2gof(datasort, 'CDF', n)
plot(i, nak);

g = fitdist(datasort, 'Gamma'); % Gamma Probability Distribution
gam = pdf('Gamma', i, g.a, g.b);
[h,p,stats] = chi2gof(datasort, 'CDF', g)
plot(i, gam, '.');

xlabel("input data");
ylabel("estimated pdf");
axis([0 16 0 0.3])
legend("data, (ksDensity)", "Weibull", "Nakagami (Best Fit)", "Gamma")
```

```
h =
    0

p =
    0.3414

stats =
    struct with fields:
        chi2stat: 4.5094
        df: 4
        edges: [0.0175 1.2995 2.5814 3.8633 5.1453 6.4272 7.7091
12.8369]
        O: [63 54 31 23 18 7 4]
        E: [60.1813 55.0011 37.1153 22.3241 12.4692 6.5880 6.3209]

h =
    0

p =
    0.3339

stats =
    struct with fields:
        chi2stat: 3.4003
        df: 3
        edges: [0.0175 1.2995 2.5814 3.8633 5.1453 6.4272 12.8369]
        O: [63 54 31 23 18 11]
        E: [57.6498 50.8626 38.8280 25.6720 14.7314 12.2561]

h =
    0

p =
    0.2097
```

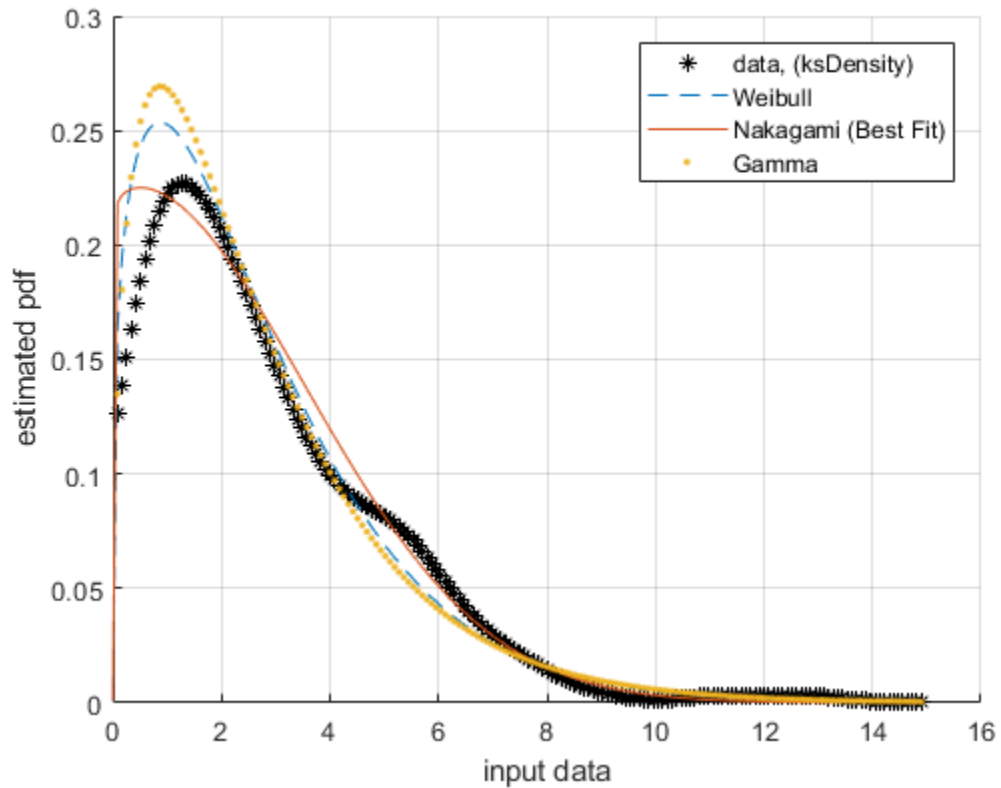
```

stats =

struct with fields:

    chi2stat: 5.8625
    df: 4
    edges: [0.0175 1.2995 2.5814 3.8633 5.1453 6.4272 7.7091
12.8369]
    O: [63 54 31 23 18 7 4]
    E: [61.5332 56.2052 35.8796 20.9571 11.7346 6.4094 7.2811]

```



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