

```
def get_pdf_probability(ds,startrange,endrange):
    from matplotlib import pyplot
    from scipy.stats import norm
    import seaborn as sns
    ax=sns.distplot(ds,kde=True,kde_kws={'color':'blue'},color='green')
    pyplot.axvline(startrange,color='Red')
    pyplot.axvline(endrange,color='Red')
    #generate a sample
    sample=ds
    #calculate parameters
    sample_mean=sample.mean()
    sample_std=sample.std()
    print('Mean=%.3f,Standard Deviation=%.3f' %(sample_mean,sample_std))
    #define the distribution
    dist=norm(sample_mean,sample_std)

    #sample probabilities for a range of outcomes
    values=[value for value in range(startrange,endrange)]
    probabilities=[dist.pdf(value) for value in values]
    prob=sum(probabilities)
    print("The area between range({},{}):{}".format(startrange,endrange,sum(probabilities)))
    return prob
```

### 1. Import Libraries:

- \* matplotlib.pyplot : Used for plotting and visualization.
- \* scipy.stats.norm: Provides the normal distribution for calculating probabilities.
- \* seaborn : Used for statistical data visualization, specifically for creating the distribution plot.

### 2. Function:

- \* startrange: The starting value of the range.
- \* endrange: The ending value of the range.

### 3. Visualization (Distribution Plot):

- \* ax = sns.distplot(ds, kde=True, kde\_kws={'color': 'blue'}, color='green')
- \* Creates a distribution plot (histogram with kernel density estimation) of the data sample ds using seaborn.distplot.
- \* kde=True enables the kernel density estimate

- \* `kde_kws={'color': 'blue'}` sets the color of the KDE curve to blue.

- \* `color='green'` sets the color of the histogram bars to green.

- \* `pyplot.axvline(startrange, color='Red')`

- \* Draws a vertical red line at the `startrange` value on the plot.

- \* `pyplot.axvline(endrange, color='Red')`

- \* Draws a vertical red line at the `endrange` value on the plot.

#### 4. Calculate Sample Statistics:

- \* `sample_mean = sample.mean()`

- \* Calculates the mean (average) of the sample.

- \* `sample_std = sample.std()`

- \* Calculates the standard deviation of the sample.

- \* `print('Mean=%.3f, Standard Deviation=%.3f' % (sample_mean, sample_std))`

- \* Prints the calculated mean and standard deviation to the console, formatted to three decimal places.

#### 5. Define Normal Distribution:

- \* `dist = norm(sample_mean, sample_std)`

- \* Creates a normal distribution object (`dist`) using the calculated `sample_mean` and `sample_std` as its parameters.

#### 6. Calculate Probabilities:

- \* `values = [value for value in range(startrange, endrange)]`

- \* Creates a list of integer values within the specified range (from `startrange` to `endrange` – 1).

- \* `probabilities = [dist.pdf(value) for value in values]`