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Lab4

Range

```
# Sample Data
arr = [1, 2, 3, 4, 5]

#Finding Max
Maximum = max(arr)
# Finding Min
Minimum = min(arr)

# Difference Of Max and Min
Range = Maximum-Minimum
print("Maximum = {}, Minimum = {} and Range = {}".format(Maximum, Minimum, Range))
```

```
Maximum = 5, Minimum = 1 and Range = 4
```

Median

```
# Python code to demonstrate the
# working of median() on various
# range of data-sets

# importing the statistics module
from statistics import median

# Importing fractions module as fr
from fractions import Fraction as fr

# tuple of positive integer numbers
data1 = (2, 3, 4, 5, 7, 9, 11)

# tuple of floating point values
data2 = (2.4, 5.1, 6.7, 8.9)

# tuple of fractional numbers
data3 = (fr(1, 2), fr(44, 12),fr(10, 3), fr(2, 3))

# tuple of a set of negative integers
data4 = (-5, -1, -12, -19, -3)

# tuple of set of positive
# and negative integers
data5 = (-1, -2, -3, -4, 4, 3, 2, 1)

# Printing the median of above datasets
print("Median of data-set 1 is % s" % (median(data1)))
print("Median of data-set 2 is % s" % (median(data2)))
print("Median of data-set 3 is % s" % (median(data3)))
print("Median of data-set 4 is % s" % (median(data4)))
print("Median of data-set 5 is % s" % (median(data5)))
```

```
Median of data-set 1 is 5
Median of data-set 2 is 5.9
Median of data-set 3 is 2
Median of data-set 4 is -5
Median of data-set 5 is 0.0
```

Median Low

```
# Python code to demonstrate the
# working of median_low()

# importing the statistics module
import statistics

# simple list of a set of integers
set1 = [1, 3, 3, 4, 5, 7]

# Print median of the data-set

# Median value may or may not
# lie within the data-set
print("Median of the set is % s"
    % (statistics.median(set1)))

# Print low median of the data-set
print("Low Median of the set is % s "
    % (statistics.median_low(set1)))
```

```
Median of the set is 3.5
Low Median of the set is 3
```

Median High

```
# Working of median_high() and median() to
# demonstrate the difference between them.

# importing the statistics module
import statistics

# simple list of a set of integers
set1 = [1, 3, 3, 4, 5, 7]

# Print median of the data-set

# Median value may or may not
# lie within the data-set
print("Median of the set is %s"
    % (statistics.median(set1)))

# Print high median of the data-set
print("High Median of the set is %s "
    % (statistics.median_high(set1)))
```

```
Median of the set is 3.5
High Median of the set is 4
```

Mode

```
# Python code to demonstrate the
# working of mode() function
# on a various range of data types

# Importing the statistics module
from statistics import mode

# Importing fractions module as fr
# Enables to calculate harmonic_mean of a
# set in Fraction
from fractions import Fraction as fr

# tuple of positive integer numbers
data1 = (2, 3, 3, 4, 5, 5, 5, 5, 6, 6, 6, 7)

# tuple of a set of floating point values
data2 = (2.4, 1.3, 1.3, 1.3, 2.4, 4.6)

# tuple of a set of fractional numbers
data3 = (fr(1, 2), fr(1, 2), fr(10, 3), fr(2, 3))

# tuple of a set of negative integers
data4 = (-1, -2, -2, -2, -7, -7, -9)

# tuple of strings
data5 = ("red", "blue", "black", "blue", "black", "black", "brown")


# Printing out the mode of the above data-sets
print("Mode of data set 1 is % s" % (mode(data1)))
print("Mode of data set 2 is % s" % (mode(data2)))
print("Mode of data set 3 is % s" % (mode(data3)))
print("Mode of data set 4 is % s" % (mode(data4)))
print("Mode of data set 5 is % s" % (mode(data5)))
```

```
Mode of data set 1 is 5
Mode of data set 2 is 1.3
Mode of data set 3 is 1/2
Mode of data set 4 is -2
Mode of data set 5 is black
```

Variance

```
# Python code to demonstrate variance()
# function on varying range of data-types

# importing statistics module
from statistics import variance

# importing fractions as parameter values
from fractions import Fraction as fr

# tuple of a set of positive integers
# numbers are spread apart but not very much
sample1 = (1, 2, 5, 4, 8, 9, 12)

# tuple of a set of negative integers
sample2 = (-2, -4, -3, -1, -5, -6)

# tuple of a set of positive and negative numbers
# data-points are spread apart considerably
sample3 = (-9, -1, -0, 2, 1, 3, 4, 19)

# tuple of a set of fractional numbers
sample4 = (fr(1, 2), fr(2, 3), fr(3, 4),
        fr(5, 6), fr(7, 8))

# tuple of a set of floating point values
sample5 = (1.23, 1.45, 2.1, 2.2, 1.9)

# Print the variance of each samples
print("Variance of Sample1 is % s " % (variance(sample1)))
print("Variance of Sample2 is % s " % (variance(sample2)))
print("Variance of Sample3 is % s " % (variance(sample3)))
print("Variance of Sample4 is % s " % (variance(sample4)))
print("Variance of Sample5 is % s " % (variance(sample5)))
```

```
Variance of Sample1 is 15.80952380952381
Variance of Sample2 is 3.5
Variance of Sample3 is 61.125
Variance of Sample4 is 1/45
Variance of Sample5 is 0.17613000000000006
```

Standard Deviation

```
  # Python code to demonstrate stdev()
# function on various range of datasets

# importing the statistics module
from statistics import stdev

# importing fractions as parameter values
from fractions import Fraction as fr

# creating a varying range of sample sets
# numbers are spread apart but not very much
sample1 = (1, 2, 5, 4, 8, 9, 12)

# tuple of a set of negative integers
sample2 = (-2, -4, -3, -1, -5, -6)

# tuple of a set of positive and negative numbers
# data-points are spread apart considerably
sample3 = (-9, -1, -0, 2, 1, 3, 4, 19)

# tuple of a set of floating point values
sample4 = (1.23, 1.45, 2.1, 2.2, 1.9)

# Print the standard deviation of
# following sample sets of observations
print("The Standard Deviation of Sample1 is % s"
  % (stdev(sample1)))
```