datascience_assignment_16.1

July 13, 2018

0.1 You survey households in your area to find the average rent they are paying. Find the standard deviation from the following data:

$1550, $1700, $900, $850, $1000, $950.

0.2 Solution:

- Write a function std_dev which takes list/tuple which returns standard deviation with Bessel's correction
- The function std_dev first cacluates mean
- From each element subtract mean and square it and sum the whole resultant elements, which is divided by (No of elements - 1) and take the square mean to calculate standard deviation with Bessel's correction

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In [1]: import functools
        import math
        def std_dev(element_list):
            # Input element_list must be either tuple or list else ValueError is raised
            if ( not isinstance(element_list, tuple)) and ( not isinstance(element_list, list))
                raise ValueError("element_list must be either list or tuple")

             # Input element_list should not be None or empty else ValueError is raised
            if element_list is None or len(element_list) == 0:
                raise ValueError("element_list can not be empty")

            # If number of elements is 1 return 0
            if len(element_list) == 1:
                return 0

            # Caclulate mean by using reduce function with lambda expresssion as sum of two nu
            # divide by number of elements
            mean = functools.reduce(lambda x,y: x+y, element_list)/len(element_list)

            # From each element subtract mean and square it and sum the whole resultant elemen
            # and take the square mean to calculate standard deviation with Bessel's correctio
            result = math.sqrt(sum([(x - mean) ** 2 for x in element_list]) / (len(element_list
            return result
```

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In [2]: element_list  = [1550, 1700, 900, 850, 1000, 950 ]
        res = std_dev(element_list)
        print("standard deviation = $" + str(res))
```

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standard deviation = $367.99003609699366
```