

# Performing various kinds of normalization on given data

```
In [94]: # age = [13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70]
n = int(input('Enter the number of elements: '))

print('Enter the elements in comma separated manner: ')
elements = input()

a = map(float,elements.split(','))

a = list(a)
a
```

Enter the number of elements: 27  
Enter the elements in comma separated manner:  
13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70

```
Out[94]: [13.0,
15.0,
16.0,
16.0,
19.0,
20.0,
20.0,
21.0,
22.0,
22.0,
25.0,
25.0,
25.0,
25.0,
30.0,
33.0,
33.0,
35.0,
35.0,
35.0,
35.0,
36.0,
40.0,
45.0,
46.0,
52.0,
70.0]
```

## Min-Max Normalization

```
In [95]: def min_max_normalize(array,v,new_min,new_max):
curr_min = min(array)
curr_max = max(array)

new_v = ((v - curr_min)/(curr_max-curr_min))*(new_max - new_min) + new_min

return new_v
```

```
In [97]: new_v = min_max_normalize(a,25,0,1)
print("v' = {0:.2f}".format(new_v))
```

v' = 0.21

## Z-score Normalization

```
In [98]: import numpy as np
def z_score_normalize(array,v):
mean = np.mean(np.array(array))
stdev = np.std(np.array(array))

print("Mean = {}".format(mean))
print("Standard Deviation = {}".format(stdev))
new_v = (v - mean) / stdev

return new_v
```

```
In [100]: new_v = z_score_normalize(a,35)
print("v' = {0:.2f}".format(new_v))
```

Mean = 29.962962962962962  
Standard Deviation = 12.700193878606099  
v' = 0.40

## Decimal Scaling

```
In [101]: def decimal_scale(array,v):
curr_min = min(array)
curr_max = max(array)

abs_max = int(max([abs(curr_min),abs(curr_max)]))
j = 0;

while abs_max != 0:
j += 1
abs_max = int(abs_max/10)

print("J = {}".format(j))

new_v = v/(10**j)

return new_v
```

```
In [102]: new_v = decimal_scale(a,35)
print("v' = {0:.2f}".format(new_v))
```

J = 2  
v' = 0.35