In [ ]:
```
Name:Akash Varade
Roll No: A-04
```

In [2]:
```
import pandas as pd
import numpy as np
student = pd.read_csv("/home/kj-comp/Akash Varade/GCR/DB/StudentsPerformance.csv
```

In [3]:
```
student.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 8 columns):
 #   Column                       Non-Null Count  Dtype  
---  ------                       --------------  -----  
 0   gender                       1000 non-null   object 
 1   race/ethnicity               1000 non-null   object 
 2   parental level of education  1000 non-null   object 
 3   lunch                        1000 non-null   object 
 4   test_preparation_course      1000 non-null   object 
 5   math_score                   991 non-null    float64
 6   reading_score                995 non-null    float64
 7   writing_score                994 non-null    float64
dtypes: float64(3), object(5)
memory usage: 62.6+ KB
```

In [5]:
```
student.isnull().sum()
```

Out[5]:
```
gender                         0
race/ethnicity                 0
parental level of education    0
lunch                          0
test_preparation_course        0
math_score                     9
reading_score                  5
writing_score                  6
dtype: int64
```

In [6]:
```
student['math_score'].fillna(int(student['math_score'].mean()), inplace=True)
```

In [7]:
```
student.isnull().sum()
```

Out[7]:
```
gender                         0
race/ethnicity                 0
parental level of education    0
lunch                          0
test_preparation_course        0
math_score                     0
reading_score                  5
writing_score                  6
dtype: int64
```

In [8]:
```
student['reading_score'].fillna(method ='pad',inplace=True)
```

In [9]:
```
student.isnull().sum()
```

Out[9]:
```
gender                         0
race/ethnicity                 0
parental level of education    0
lunch                          0
test_preparation_course        0
math_score                     0
reading_score                  0
writing_score                  6
dtype: int64
```

In [10]:
```
student['writing_score'].fillna(int(student['writing_score'].median()), inplace=
```

In [11]:
```
student.isnull().sum()
```

Out[11]:
```
gender                         0
race/ethnicity                 0
parental level of education    0
lunch                          0
test_preparation_course        0
math_score                     0
reading_score                  0
writing_score                  0
dtype: int64
```

In [12]:
```
from numpy.random import seed
from numpy.random import randn
from numpy import mean
from numpy import std
seed(1)
#univariate dataset- single variable/ attribute
#multivariate detaset-muliple variables/attributes
data=5*randn(10000)+50
print('mean=%.3f stdv=%.3f' %(mean(data), std(data)))
```

```
mean=50.049 stdv=4.994
```

In [13]:
```
data_mean = mean(data)
data_std = std(data)
cut_off = data_std * 3
lower = data_mean - cut_off
upper = data_mean + cut_off
```

In [14]:
```
outliers=[x for x in data if x<lower or x > upper]
outliers
```

Out[14]:

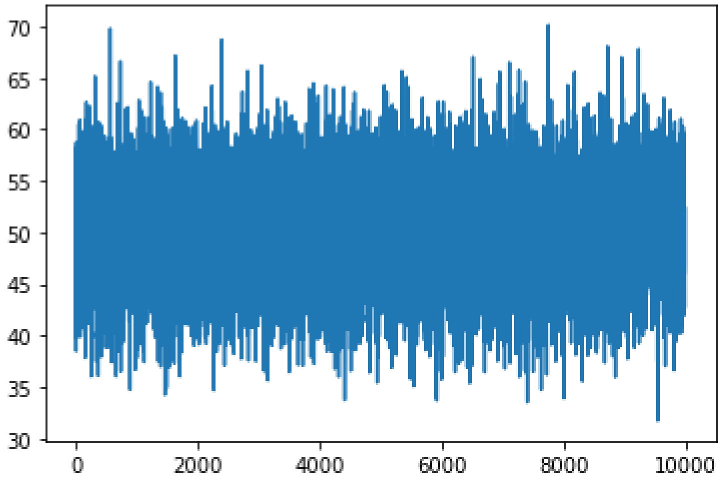
```
[65.15428556186015,
 69.79301352018982,
 66.60539378085183,
 34.73117809786848,
 34.23321274904475,
 34.91984007395351,
 67.1633171589778,
 34.679293219474495,
 68.70124451852294,
 65.67523670043954,
 66.19171598376188,
 33.73482882511691,
 65.66014864070253,
 65.06377284118616,
 34.0469182658796,
 33.6969245211173,
 67.02151137874486,
 65.59239795391275,
 66.49270261640393,
 65.74492012609815,
 33.525707966507426,
 34.72183379792847,
 70.1342452227369,
 33.90433947188079,
 65.55945915508362,
 68.06638503541573,
 66.99057828251213,
 67.80436660352774,
 31.717799503726024]
```

In [15]:

```python
import matplotlib.pyplot as plt
plt.plot(data)
```

Out[15]:

```
[<matplotlib.lines.Line2D at 0x7f7d0f756880>]
```

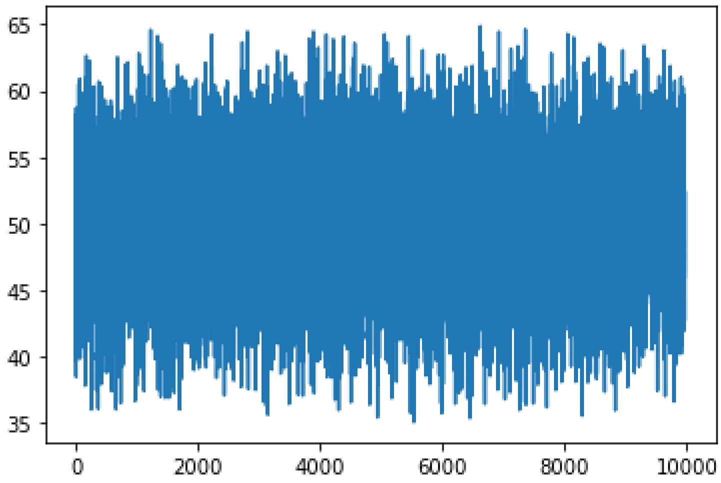


In [16]:

```python
outliers_removed=[x for x in data if x>=lower and x<=upper]
plt.plot(outliers_removed)
```

Out[16]:

```
[<matplotlib.lines.Line2D at 0x7f7d0eabb6d0>]
```



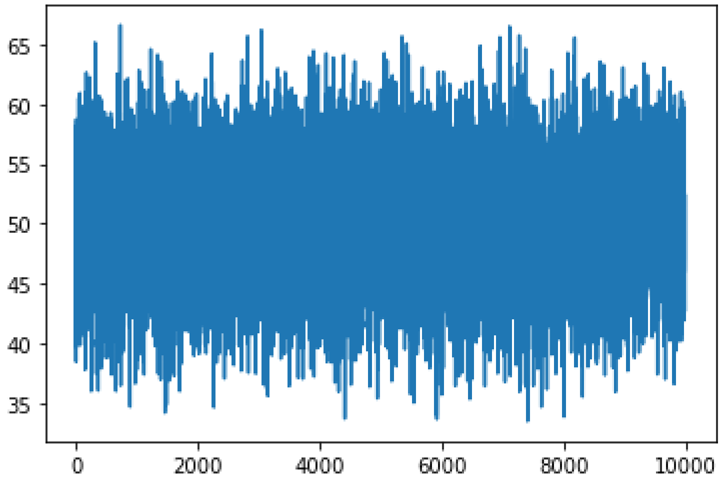
In [17]:
```
from numpy.lib.function_base import percentile
q25=percentile(data,25)
q75=percentile(data,75)
IQR=q75-q25
cut_off_IQR= IQR * 2
lower=q25-cut_off_IQR
upper= q75 +cut_off_IQR
```

In [18]:
```
outliers_IQR = [x for x in data if x < lower or x > upper]
outliers_IQR
```

Out[18]:
```
[69.79301352018982,
 67.1633171589778,
 68.70124451852294,
 67.02151137874486,
 70.1342452227369,
 68.06638503541573,
 66.99057828251213,
 67.80436660352774,
 31.717799503726024]
```

In [19]:
```
outliers_removed=[x for x in data if x>=lower and x<=upper]
plt.plot(outliers_removed)
```

Out[19]:
```
[<matplotlib.lines.Line2D at 0x7f7d0eae0340>]
```



In [20]:
```
from sklearn.preprocessing import MinMaxScaler
```

In [21]:

```
mms = MinMaxScaler()
```

In [28]:

```
student[['math_score','reading_score','writing_score']] = mms.fit_transform(stud
```

In [29]:

```
student.head()
```

Out[29]:

	gender	race/ethnicity	parental level of education	lunch	test_preparation_course	math_score
0	female	group B	bachelor's degree	standard	none	0.72
1	female	group C	some college	standard	completed	0.69
2	female	group B	master's degree	standard	none	0.90
3	male	group A	associate's degree	free/reduced	none	0.47
4	male	group C	some college	standard	none	0.76

In [ ]: