MINI PROJECT 1
Inferential Statistics

Group Members Name

1. Dinesh Subramanian

2. S.Aishwarya

3. Vinod A

Question -1(20 Marks)

a.Read the Dataset "turnout.csv" (1 mark)

b.Identify non-numerical inputs and convert into numerical wherever needed (3 marks) (*Hint: Use replace function if needed)

c. Check whether the dataset having null values or not. If yes, do replace them with suitable average value (2 marks) (*Think out of box)

d.Find mean, median and mode for atleast one possible column for each (3 marks)

e.Check the outliers and remove it from the dataset. (3 marks)

f.A city affected by 3 cyclones in a year on an average. Find the probability if the same city will getting affected by exactly 2 cyclones in the upcoming year (4 marks)

g.If an athlete attended 6 olympics in his lifetime. Find the probability if he exactly have 2 wins (4 marks)

In [2]:
```
#import the libraries
import pandas as pd
import numpy as np
import seaborn as sns
from matplotlib import pyplot as plt
import scipy.stats as stats
```

A. Read the Dataset "turnout.csv" (1 mark)

In [3]:
```
df = pd.read_csv("turnout.csv",encoding = "ANSI")
df
```

Out[3]:

	Employee ID	event	gender	age	industry	profession	traffic	coach	head_gend
0	1011	1	m	35.0	Banks	HR	rabrecNErab	no	
1	1012	1	m	33.0	Banks	HR	empjs	no	
2	1013	1	f	35.0	PowerGeneration	HR	rabrecNErab	no	
3	1014	1	f	35.0	PowerGeneration	HR	rabrecNErab	no	
4	1015	1	m	32.0	Retail	Commercial	youjs	yes	
...	...	...	...	...	...	...	...	...	
1124	2135	0	f	41.0	Banks	HR	rabrecNErab	my head	
1125	2136	0	f	41.0	Banks	HR	rabrecNErab	my head	
1126	2137	0	f	34.0	Telecom	Accounting	KA	no	
1127	2138	0	f	51.0	Consult	HR	empjs	no	
1128	2139	0	f	29.0	Retail	HR	youjs	no	

1129 rows × 16 columns

B.Identify non-numerical inputs and convert into numerical whatever needed (3 marks)

(*Hint: Use replace function if needed)

In [4]:
```
# planned to convert m/f to 0/1 in gender and head_gender columns

df['gender'].replace(to_replace=['m','f'], value= [0 , 1],inplace=True)
df['head_gender'].replace(to_replace=['m','f'], value= [0 , 1],inplace=True)
df.head()
```

Out[4]:

	Employee ID	event	gender	age	industry	profession	traffic	coach	head_gender
0	1011	1	0	35.0	Banks	HR	rabrecNErab	no	1
1	1012	1	0	33.0	Banks	HR	empjs	no	0
2	1013	1	1	35.0	PowerGeneration	HR	rabrecNErab	no	0
3	1014	1	1	35.0	PowerGeneration	HR	rabrecNErab	no	0
4	1015	1	0	32.0	Retail	Commercial	youjs	yes	1

C. Describe the statistical measures using single function (2

marks)

In [5]:
```
1 df.describe()
```

Out[5]:

	Employee ID	event	gender	age	head_gender	extraversion	independ
count	1129.000000	1129.000000	1129.000000	1129.000000	1129.000000	1128.000000	1127.000000
mean	1575.000000	0.505757	0.755536	31.050136	0.482728	5.593262	5.480479
std	326.058533	0.500188	0.429959	7.419808	0.499923	1.852222	1.703578
min	1011.000000	0.000000	0.000000	2.000000	0.000000	1.000000	1.000000
25%	1293.000000	0.000000	1.000000	25.000000	0.000000	4.600000	4.100000
50%	1575.000000	1.000000	1.000000	30.000000	0.000000	5.400000	5.500000
75%	1857.000000	1.000000	1.000000	36.000000	1.000000	7.000000	6.900000
max	2139.000000	1.000000	1.000000	98.000000	1.000000	10.000000	10.000000

D.Find mean, median and mode for atleast one possible column for each (3 marks)

In [6]:
```
1  import statistics as stat
2
3  # mean of age
4  print("Mean of column age :",stat.mean(df["age"]))
5
6  # median of age
7  print("Median of column age :",stat.median(df["age"]))
8
9  # mode of age
10 print("Mode of column age :",stat.mode(df["age"]))
```

```
Mean of column age : 31.050135512072632
Median of column age : 30.0
Mode of column age : 26.0
```

E.Check the outliers and remove it from the dataset. (3 marks)

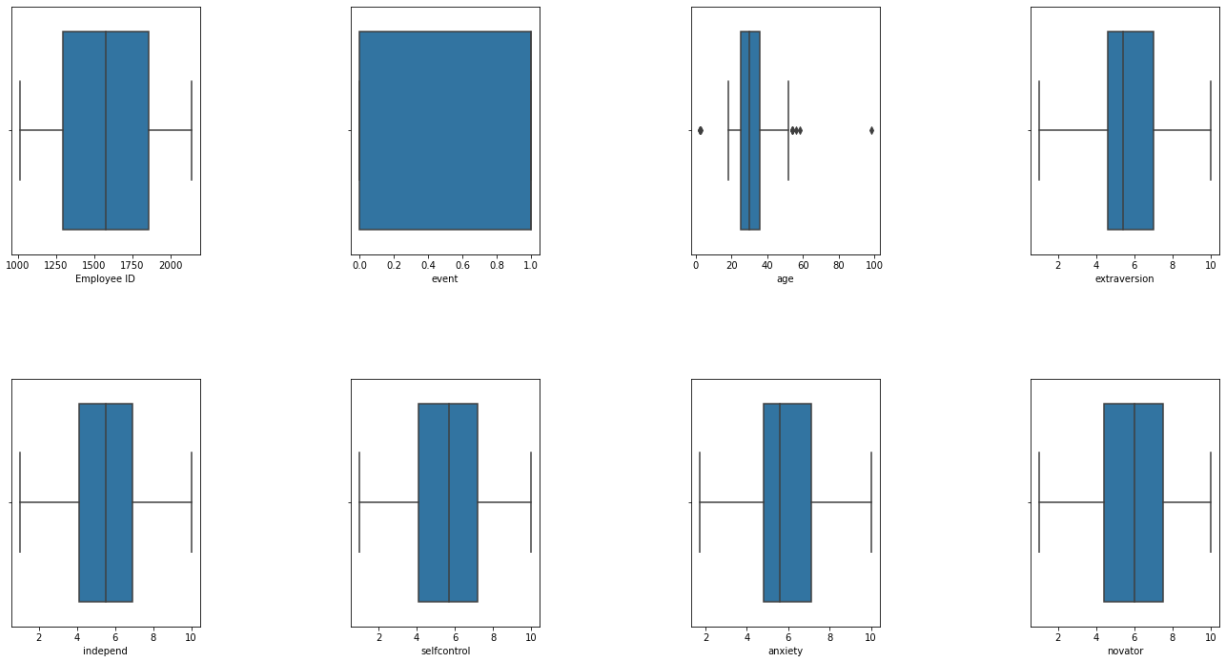
In [7]:

```
#dimensions of subplots (rows, columns, figsize=(width,height))
import warnings
fig, axes = plt.subplots(2, 4, figsize=(20,10))
warnings.filterwarnings("ignore")

#create chart in each subplot
sns.boxplot(df['Employee ID'],ax=axes[0,0])
sns.boxplot(df['event'],ax=axes[0,1])
sns.boxplot(df['age'],ax=axes[0,2])
sns.boxplot(df['extraversion'],ax=axes[0,3])
sns.boxplot(df['independ'],ax=axes[1,0])
sns.boxplot(df['selfcontrol'],ax=axes[1,1])
sns.boxplot(df['anxiety'],ax=axes[1,2])
sns.boxplot(df['novator'],ax=axes[1,3])

fig.subplots_adjust(left=0.10, right=0.98, bottom=0, top=0.9,
                    hspace=0.5, wspace=0.8)

```



In [8]:

```
# outlier verification for some columns depends on  normal distribution
columnsNeeded = ['Employee ID','age','independ','selfcontrol','anxiety','nov
for i in columnsNeeded:
    outliersList = []
    [ outliersList.append(j) for j in df[i] if (j>=((df[i].mean())+ 3*(df[i]
    print(i,len(outliersList) , " list : ", outliersList)
```

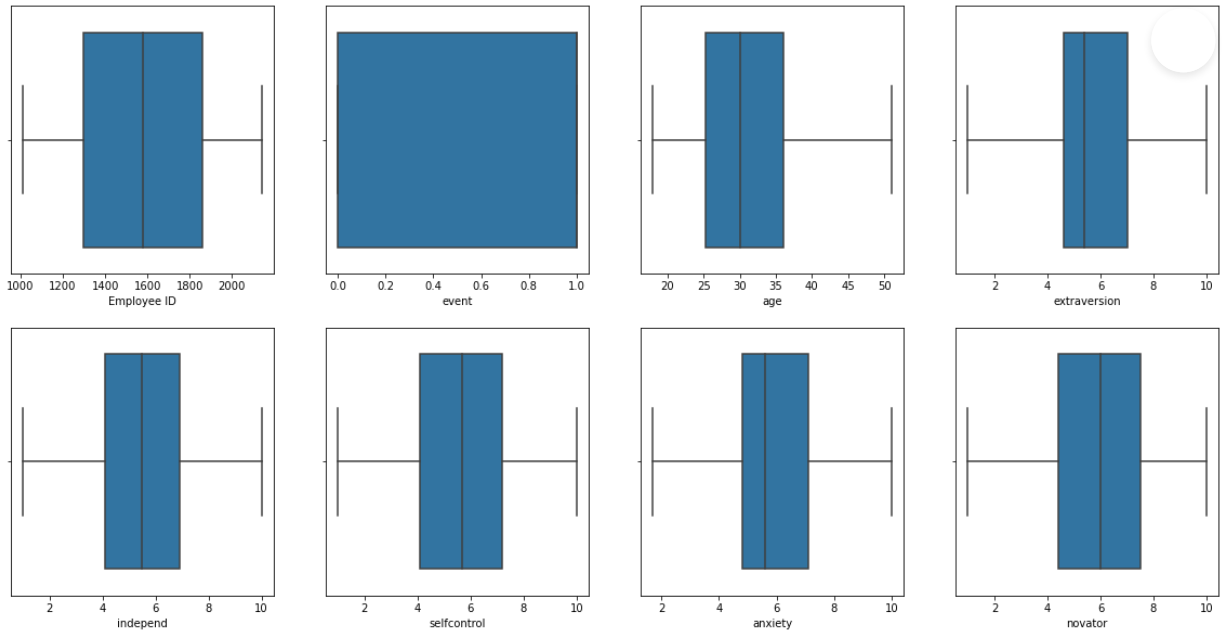
```
Employee ID 0  list :  []
age 10  list :  [2.0, 98.0, 2.0, 3.0, 54.0, 54.0, 56.0, 58.0, 54.0, 54.0]
independ 0  list :  []
selfcontrol 0  list :  []
anxiety 0  list :  []
novator 0  list :  []
extraversion 0  list :  []
event 0  list :  []
```

In [10]:

```
# as age columns have 10 outlier values as per normalization, we are removin
outliersList =[]
[ outliersList.append(j) for j in df['age'] if (j>=((df['age'].mean())+ 3*(d
[df.drop(df[df['age'] == i].index, inplace = True) for i in outliersList]

fig, axes = plt.subplots(2, 4, figsize=(20,10))
# plots after removing the outliers

#create chart in each subplot
sns.boxplot(df['Employee ID'],ax=axes[0,0])
sns.boxplot(df['event'],ax=axes[0,1])
sns.boxplot(df['age'],ax=axes[0,2])
sns.boxplot(df['extraversion'],ax=axes[0,3])
sns.boxplot(df['independ'],ax=axes[1,0])
sns.boxplot(df['selfcontrol'],ax=axes[1,1])
sns.boxplot(df['anxiety'],ax=axes[1,2])
sns.boxplot(df['novator'],ax=axes[1,3])
plt.show()
```



F. A city affected by 3 cyclones in a year on an average. Find the probability if the same city will getting affected by exactly 2 cyclones in the upcoming year (4 marks)

In [9]:

```
print("The Probablity of exactly getting 2 cyclones in upcoming year",stats.
```

```
The Probablity of exactly getting 2 cyclones in upcoming year 0.224041807655387
75
```

G.If an athlete attended 6 olympics in his lifetime. Find the probability if he exactly have 2 wins (4 marks)

In [11]:

```
# lifetime be any and comes under time range
# attended olympics be 6
a = 6
# wins be 2
x = 2
# lets calculate probablity based on poisson

print("The Probablity of exactly getting 2 wins out of 6 olymics was",stats.
```

```
The Probablity of exactly getting 2 wins out of 6 olymics was 0.234375000000000
03
```

In [ ]:

```

```