In [127…
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

In [108…
```
df = pd.read_csv('insurance.csv')
```

In [109…
```
df.head()
```

Out[109…

	age	sex	bmi	children	smoker	region	charges
0	19	female	27.900	0	yes	southwest	16884.92400
1	18	male	33.770	1	no	southeast	1725.55230
2	28	male	33.000	3	no	southeast	4449.46200
3	33	male	22.705	0	no	northwest	21984.47061
4	32	male	28.880	0	no	northwest	3866.85520

In [110…
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1338 entries, 0 to 1337
Data columns (total 7 columns):
 #   Column    Non-Null Count  Dtype  
---  ------    --------------  -----  
 0   age       1338 non-null   int64  
 1   sex       1338 non-null   object 
 2   bmi       1338 non-null   float64
 3   children  1338 non-null   int64  
 4   smoker    1338 non-null   object 
 5   region    1338 non-null   object 
 6   charges   1338 non-null   float64
dtypes: float64(2), int64(2), object(3)
memory usage: 73.3+ KB
```

In [111…
```
df.shape
```

Out[111…
```
(1338, 7)
```

In [112…
```
df.columns
```

Out[112…
```
Index(['age', 'sex', 'bmi', 'children', 'smoker', 'region', 'charges'], dtype
='object')
```

In [113…
```
df.describe
```

Out[113…
```
<bound method NDFrame.describe of       age     sex     bmi  children smoker
region      charges
0      19  female  27.900         0    yes  southwest  16884.92400
1      18    male  33.770         1     no  southeast   1725.55230
2      28    male  33.000         3     no  southeast   4449.46200
3      33    male  22.705         0     no  northwest  21984.47061
4      32    male  28.880         0     no  northwest   3866.85520
...   ...     ...     ...       ...    ...        ...          ...
1333   50    male  30.970         3     no  northwest  10600.54830
1334   18  female  31.920         0     no  northeast   2205.98080
1335   18  female  36.850         0     no  southeast   1629.83350
1336   21  female  25.800         0     no  southwest   2007.94500
1337   61  female  29.070         0    yes  northwest  29141.36030

[1338 rows x 7 columns]>
```

In [114…
```
df.describe
```

Out[114…
```
<bound method NDFrame.describe of       age     sex     bmi  children smoker
region      charges
0      19  female  27.900         0    yes  southwest  16884.92400
1      18    male  33.770         1     no  southeast   1725.55230
2      28    male  33.000         3     no  southeast   4449.46200
3      33    male  22.705         0     no  northwest  21984.47061
4      32    male  28.880         0     no  northwest   3866.85520
...   ...     ...     ...       ...    ...        ...          ...
1333   50    male  30.970         3     no  northwest  10600.54830
1334   18  female  31.920         0     no  northeast   2205.98080
1335   18  female  36.850         0     no  southeast   1629.83350
1336   21  female  25.800         0     no  southwest   2007.94500
1337   61  female  29.070         0    yes  northwest  29141.36030

[1338 rows x 7 columns]>
```

In [115…
```
df.sex.unique()
```

Out[115…
```
array(['female', 'male'], dtype=object)
```

In [116…
```
df.isnull().sum()
```

Out[116…
```
age         0
sex         0
bmi         0
children    0
smoker      0
region      0
charges     0
dtype: int64
```

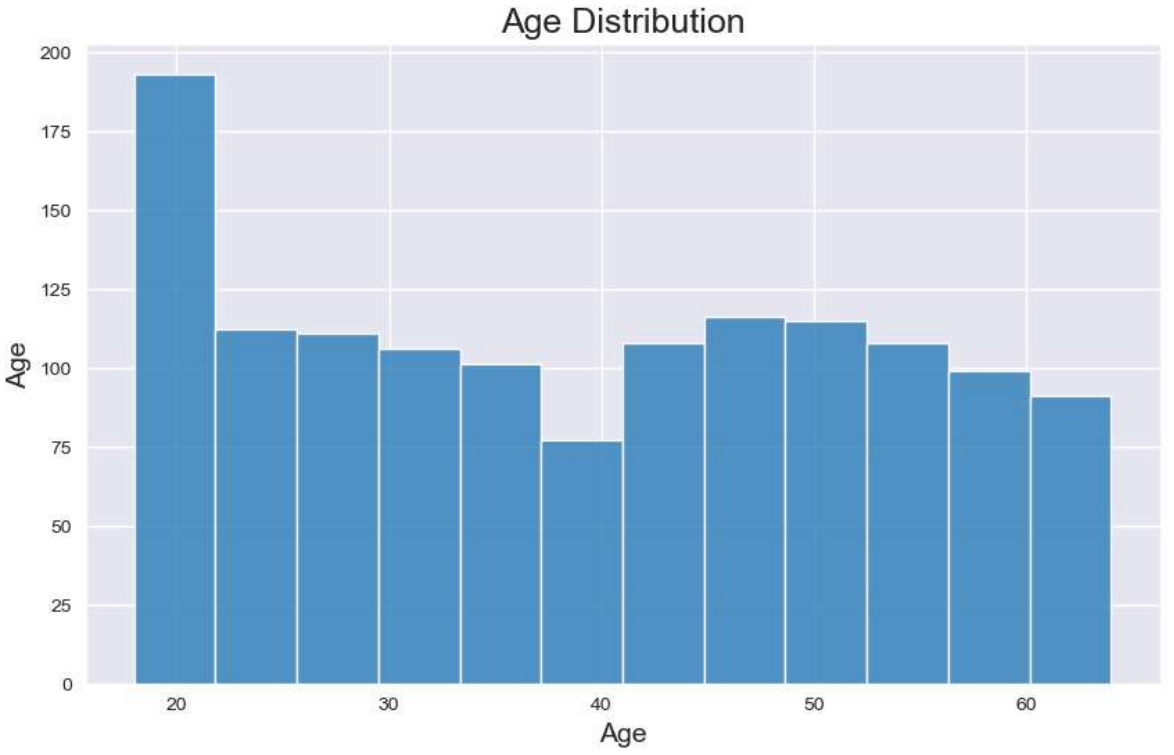
In [117…
```
df[df.duplicated]
```

Out[117…

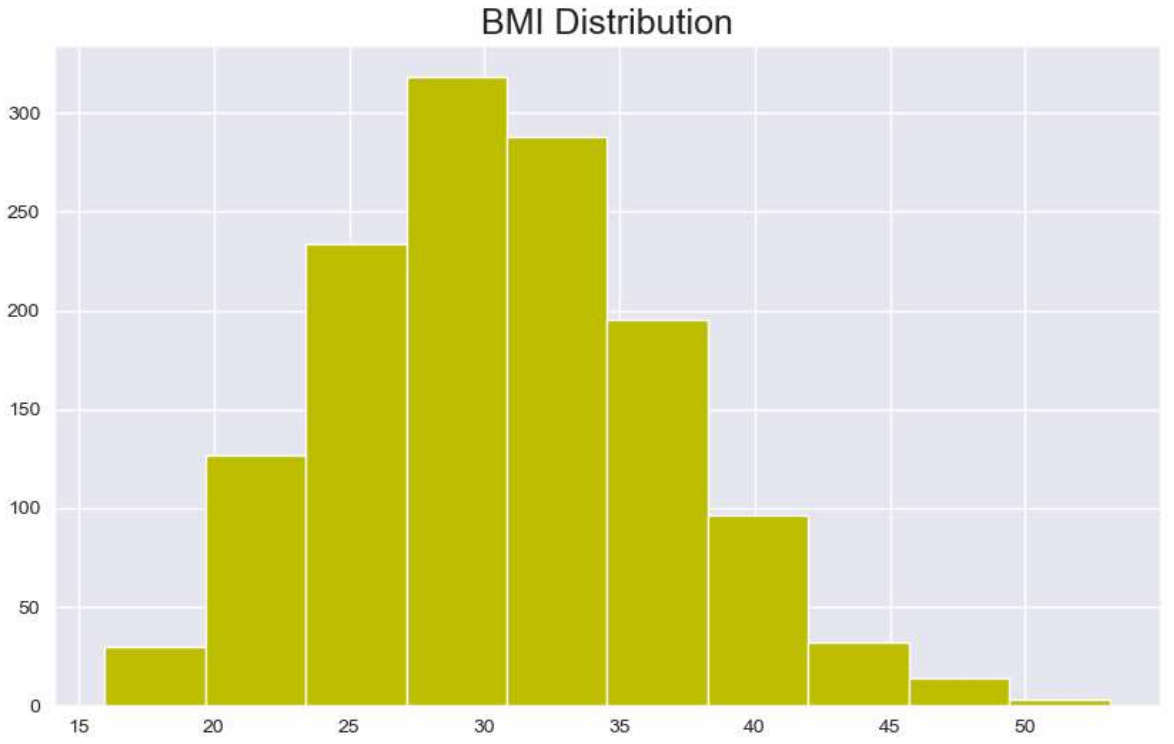
	age	sex	bmi	children	smoker	region	charges
581	19	male	30.59	0	no	northwest	1639.5631

In [118…
```
df.drop_duplicates(keep = 'first', inplace = True)
```

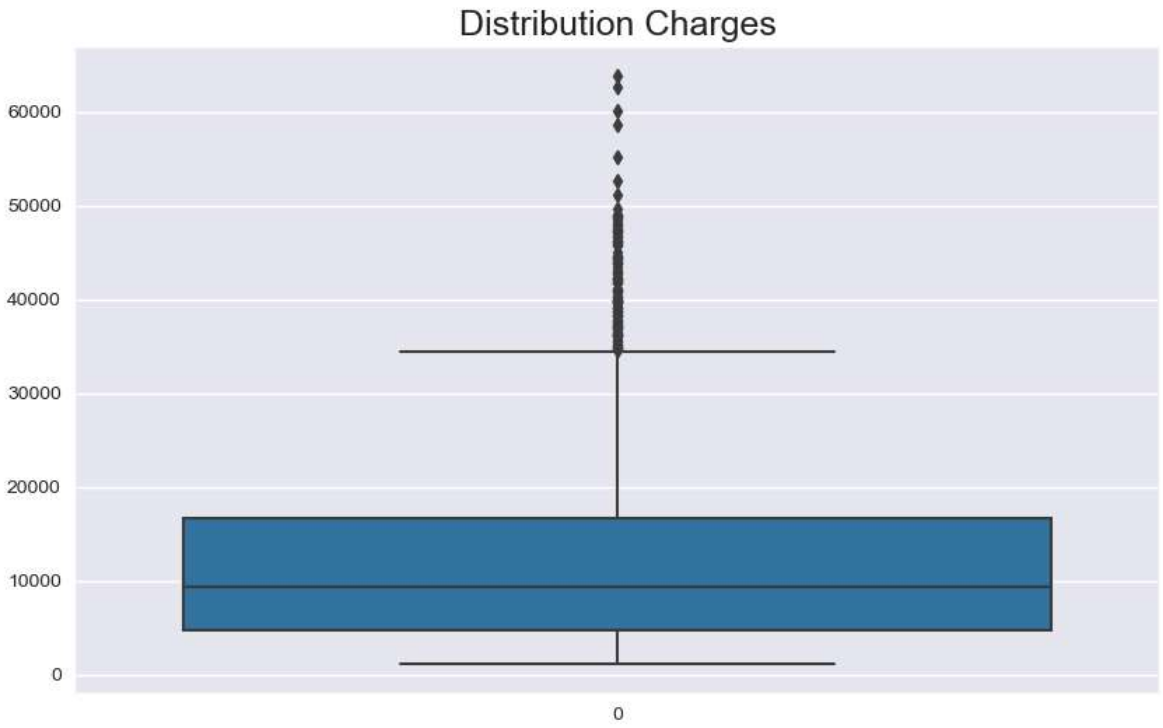
In [128…
```
plt.figure(figsize=(10,6))
sns.histplot(df.age)
plt.title('Age Distribution', size=18)
plt.xlabel('Age', size=14)
plt.ylabel('Age', size=14)
plt.show()
```



In [120…
```
plt.figure(figsize=(10,6))
plt.hist(df.bmi,color='y')
plt.title('BMI Distribution',size=18)
plt.show()
```



In [121…
```
plt.figure(figsize = (10,6))
sns.boxplot(df.charges)
plt.title('Distribution Charges',size=18)
plt.show()
```



In [122…
```
Q1 = df['charges'].quantile(0.25)
Q3 = df['charges'].quantile(0.75)
IQR = Q3 - Q1
print(IQR)
```

```
11911.37345
```

In [101…
```
df[(df['charges']< Q1-1.5* IQR) | (df['charges']> Q3+1.5* IQR)]
```

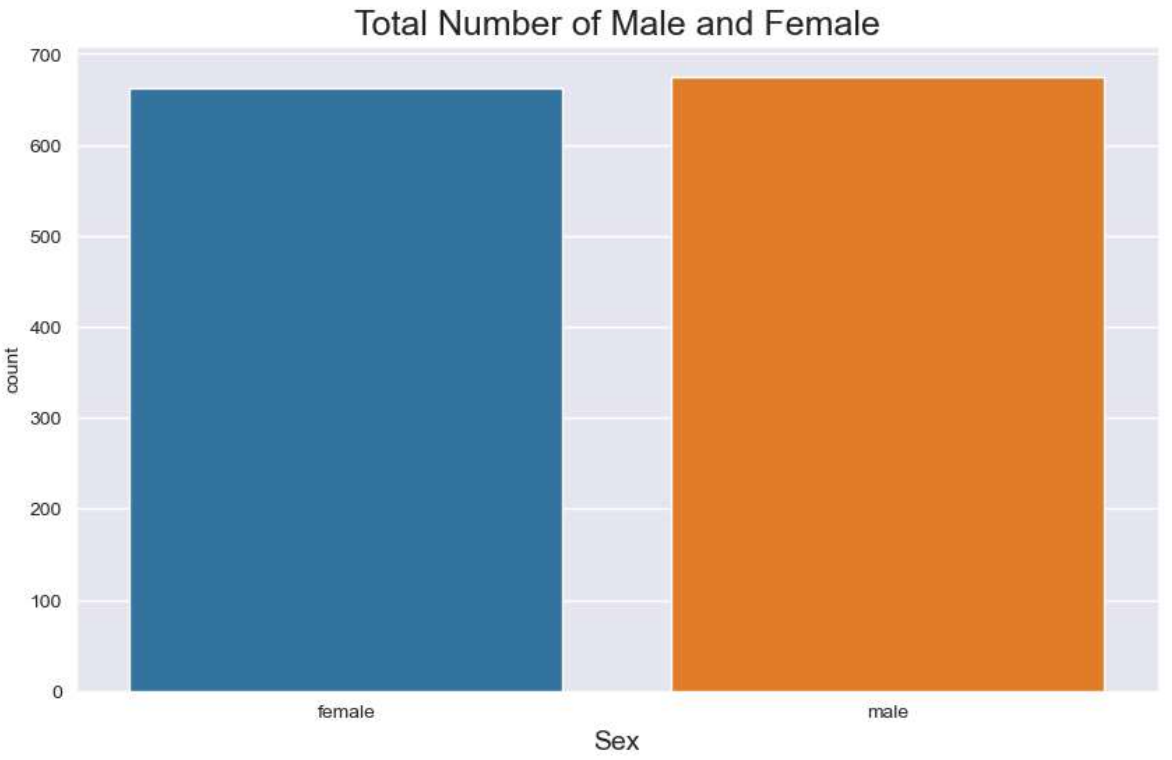
Out[101…

	age	sex	bmi	children	smoker	region	charges
14	27	male	42.130	0	yes	southeast	39611.75770
19	30	male	35.300	0	yes	southwest	36837.46700
23	34	female	31.920	1	yes	northeast	37701.87680
29	31	male	36.300	2	yes	southwest	38711.00000
30	22	male	35.600	0	yes	southwest	35585.57600
...	...	...	...	...	...	...	...
1300	45	male	30.360	0	yes	southeast	62592.87309
1301	62	male	30.875	3	yes	northwest	46718.16325
1303	43	male	27.800	0	yes	southwest	37829.72420
1313	19	female	34.700	2	yes	southwest	36397.57600
1323	42	female	40.370	2	yes	southeast	43896.37630

139 rows × 7 columns

In [102…

```
plt.figure(figsize=(10,6))
sns.countplot(x = 'sex', data = df)
plt.title('Total Number of Male and Female',size=18)
plt.xlabel('Sex',size=14)
plt.show()
```



In [103…

```
df.smoker.value_counts()
```

Out[103…
```
smoker
no     1063
yes     274
Name: count, dtype: int64
```

In [132…
```
plt.figure(figsize = (10,6))
sns.set_style('darkgrid')
sns.boxplot(x='smoker',y='charges',data=df)
plt.title('Smoker vs Charges',size=18);
```