In [1]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')
```

In [2]:
```
data = pd.read_csv("insurance.csv")
data.head()
```

Out[2]:

	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 [3]:
```
print("Shape of dataframe",data.shape)
```

```
Shape of dataframe (1338, 7)
```

In [4]:
```
data.describe()
```

Out[4]:

	age	bmi	children	charges
count	1338.000000	1338.000000	1338.000000	1338.000000
mean	39.207025	30.663397	1.094918	13270.422265
std	14.049960	6.098187	1.205493	12110.011237
min	18.000000	15.960000	0.000000	1121.873900
25%	27.000000	26.296250	0.000000	4740.287150
50%	39.000000	30.400000	1.000000	9382.033000
75%	51.000000	34.693750	2.000000	16639.912515
max	64.000000	53.130000	5.000000	63770.428010

In [5]:
```
data.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 [6]:
```
data.isnull().sum()
```

Out[6]:
```
age         0
sex         0
bmi         0
children    0
smoker      0
region      0
charges     0
dtype: int64
```

In [7]:
```
data.dtypes
```

Out[7]:
```
age           int64
sex          object
bmi         float64
children      int64
smoker       object
region       object
charges     float64
dtype: object
```

In [8]:
```
data.dtypes.value_counts()
```

Out[8]:
```
object     3
int64      2
float64    2
dtype: int64
```

In [9]:
```
data.describe().transpose()
```

Out[9]:

	count	mean	std	min	25%	50%	75%	
age	1338.0	39.207025	14.049960	18.0000	27.00000	39.000	51.000000	64.0
bmi	1338.0	30.663397	6.098187	15.9600	26.29625	30.400	34.693750	53.1
children	1338.0	1.094918	1.205493	0.0000	0.00000	1.000	2.000000	5.0
charges	1338.0	13270.422265	12110.011237	1121.8739	4740.28715	9382.033	16639.912515	63770.4

In [10]:
```
#Age category
data.loc[(data["age"] >= 18) & (data["age"] < 36),"yas_grubu"] = "genc"
data.loc[(data["age"] >= 36) & (data["age"] <= 55),"yas_grubu"] = "olgun"
data.loc[(data["age"] >55) ,"yas_grubu"] = "yasli"
data["yas_grubu"].value_counts()
```

Out[10]:
```
genc     574
olgun    548
yasli    216
Name: yas_grubu, dtype: int64
```

In [11]:
```
#weight category
data.loc[data["bmi"] < 18.5,"kilo_durumu"] = "cok zayif"
```

```
data.loc[(data["bmi"]>= 18.5)& (data["bmi"] < 25),"kilo_durumu"] = "normal"
data.loc[(data["bmi"] >= 25) & (data["bmi"] < 30),"kilo_durumu"] = "kilolu"
data.loc[data["bmi"] >= 30,"kilo_durumu"] = "obez"
data["kilo_durumu"].value_counts()
```

Out[11]:
```
obez         707
kilolu       386
normal       225
cok zayif     20
Name: kilo_durumu, dtype: int64
```

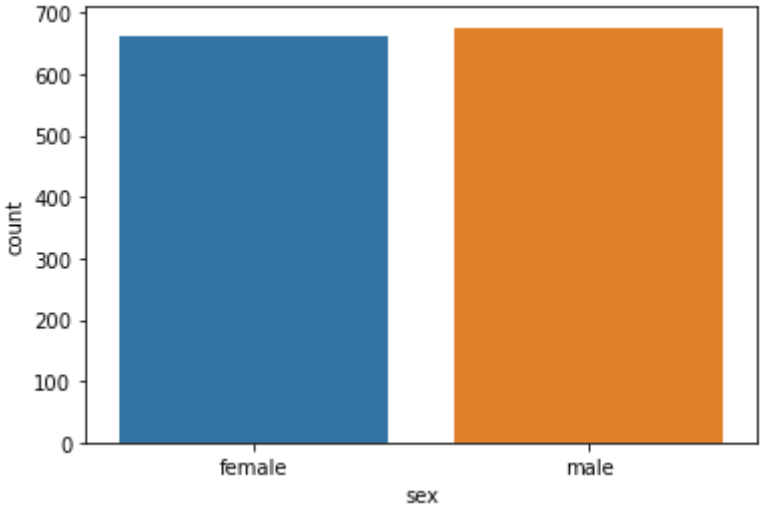
In [12]:
```
data.isnull().sum()
```

Out[12]:
```
age            0
sex            0
bmi            0
children       0
smoker         0
region         0
charges        0
yas_grubu      0
kilo_durumu    0
dtype: int64
```

Görselleştirme

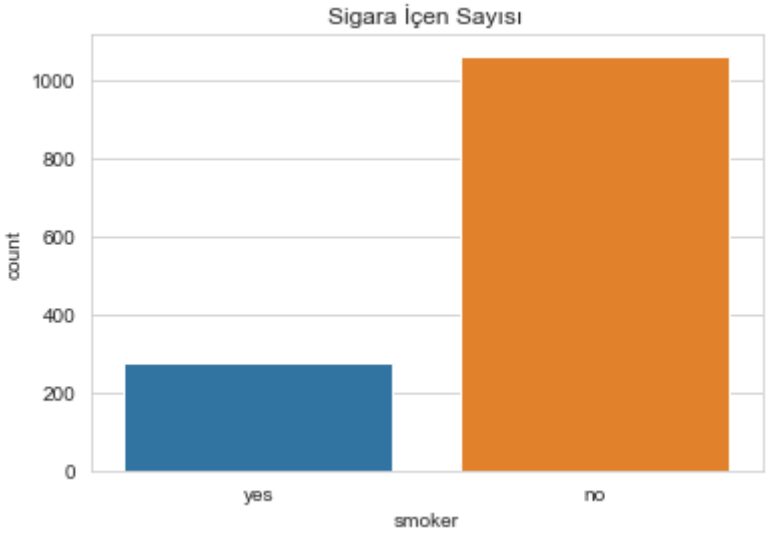
In [13]:
```
sns.countplot(data["sex"])
```

Out[13]:
```
<AxesSubplot:xlabel='sex', ylabel='count'>
```



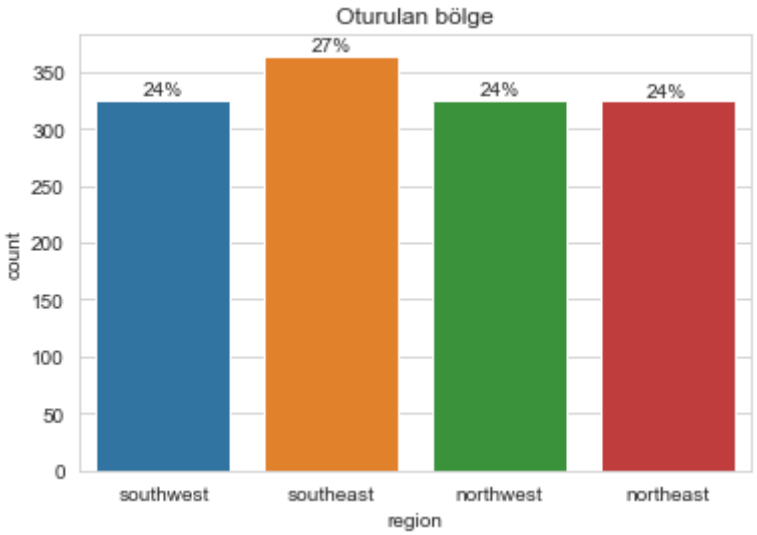
In [59]:
```
sns.countplot(data["smoker"])
plt.title("Sigara İçen Sayısı")
```

Out[59]:
```
Text(0.5, 1.0, 'Sigara İçen Sayısı')
```



In [58]:

```
total = len(data)
ax = sns.countplot(data["region"])
plt.title("Oturulan bölge")
for p in ax.patches:
    percentage = '{0:.0f}%'.format(p.get_height() / total * 100)
    x = p.get_x() + p.get_width() / 2
    y = p.get_height() + 5
    ax.annotate(percentage, (x, y), ha = 'center')
```

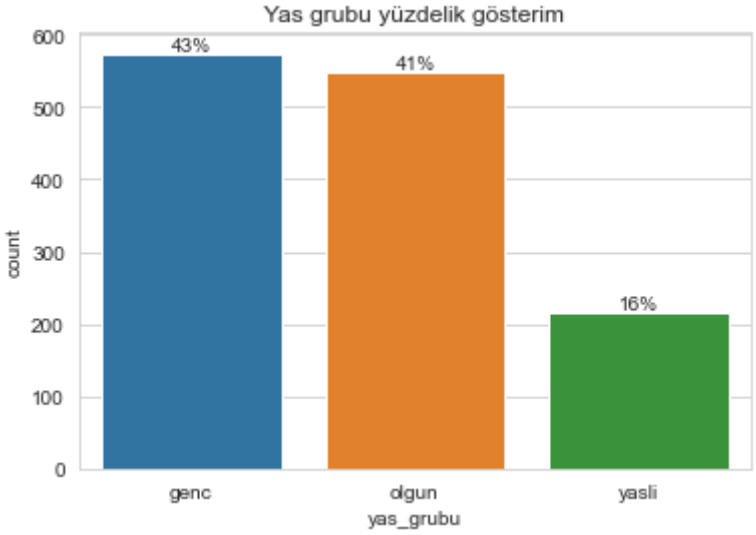


In [56]:

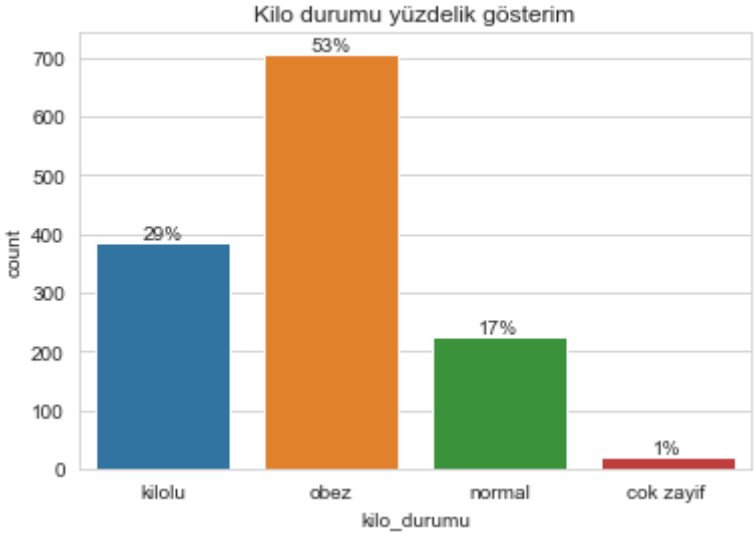
```
total = len(data)
ax = sns.countplot(x="yas_grubu",data=data)
for p in ax.patches:
    percentage = '{0:.0f}%'.format(p.get_height() / total * 100)
    x = p.get_x() + p.get_width() / 2
    y = p.get_height() + 5
    ax.annotate(percentage, (x, y), ha = 'center')
plt.title("Yas grubu yüzdelik gösterim")
```

Out[56]:

```
Text(0.5, 1.0, 'Yas grubu yüzdelik gösterim')
```

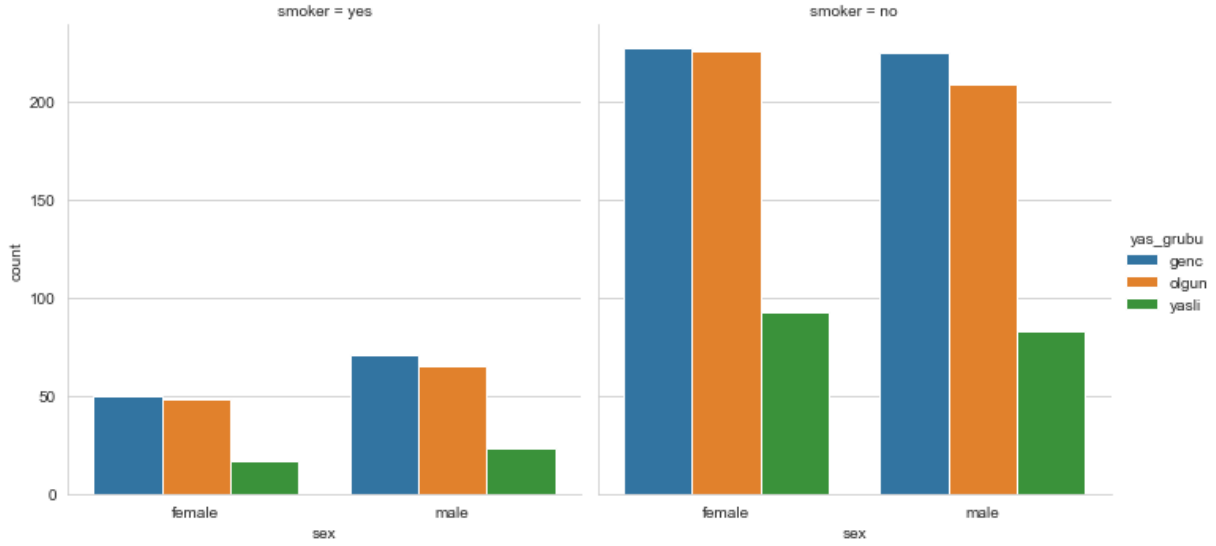


In [57]:
```
total = len(data)
ax = sns.countplot(x="kilo_durumu", data = data)
plt.title("Kilo durumu yüzdelik gösterim")
for p in ax.patches:
    percentage = '{0:.0f}%'.format(p.get_height() / total * 100)
    x = p.get_x() + p.get_width() / 2
    y = p.get_height() + 5
    ax.annotate(percentage, (x, y), ha = 'center')
```

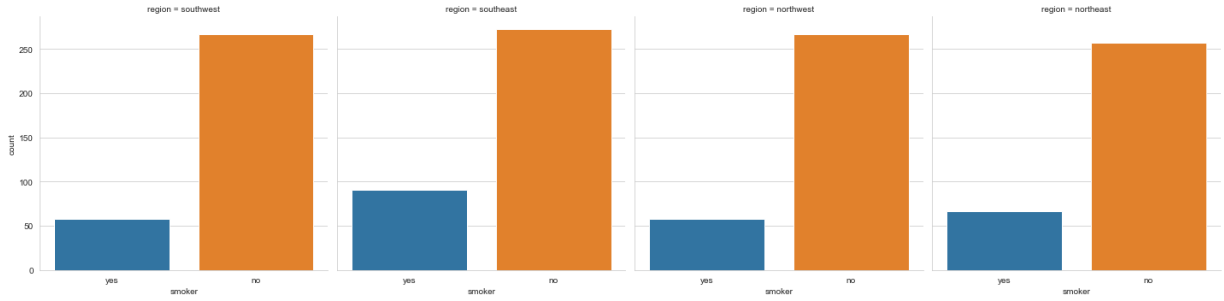


In [18]:
```
sns.set_style('whitegrid')
sns.catplot('sex', col = 'smoker', hue = 'yas_grubu', data = data, kind = 'count')
```

Out[18]:
```
<seaborn.axisgrid.FacetGrid at 0x19b57820160>
```

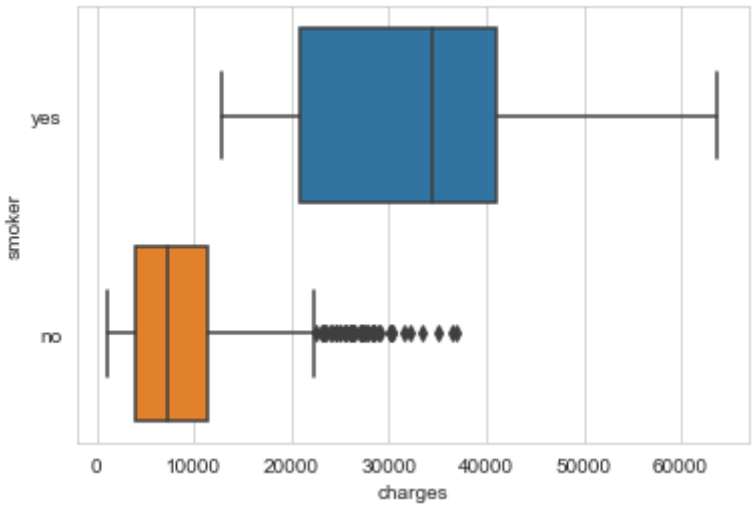


In [19]:
```
sns.set_style("whitegrid")
sns.catplot(x="smoker",col="region", data = data, kind = "count")
plt.show()
```



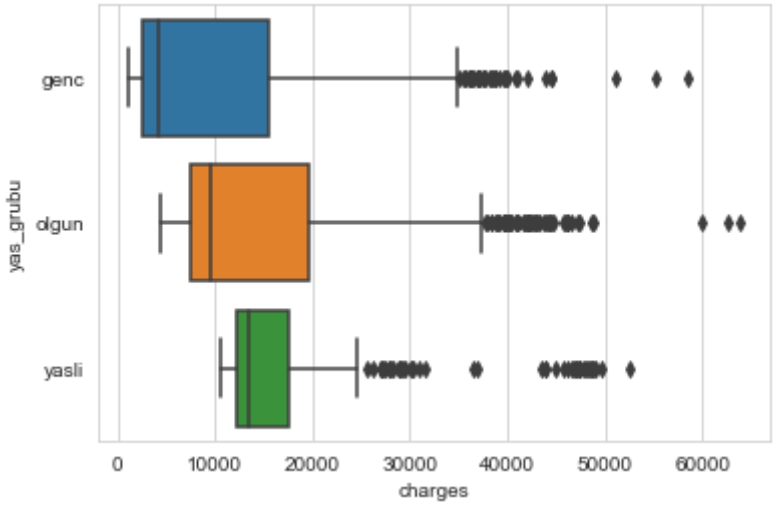
In [47]:
```
sns.boxplot(x="charges", y="smoker", data=data)
```

Out[47]:
```
<AxesSubplot:xlabel='charges', ylabel='smoker'>
```



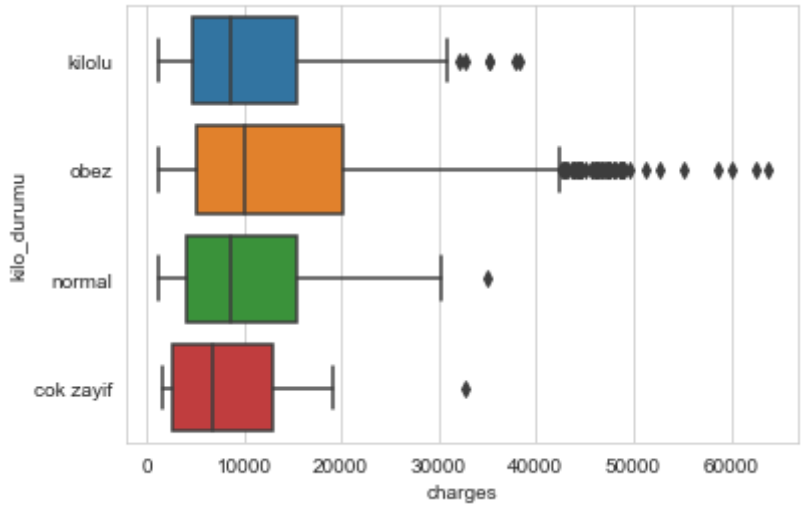
In [46]:
```
sns.boxplot(x="charges",y="yas_grubu", data=data)
```

Out[46]:
```
<AxesSubplot:xlabel='charges', ylabel='yas_grubu'>
```



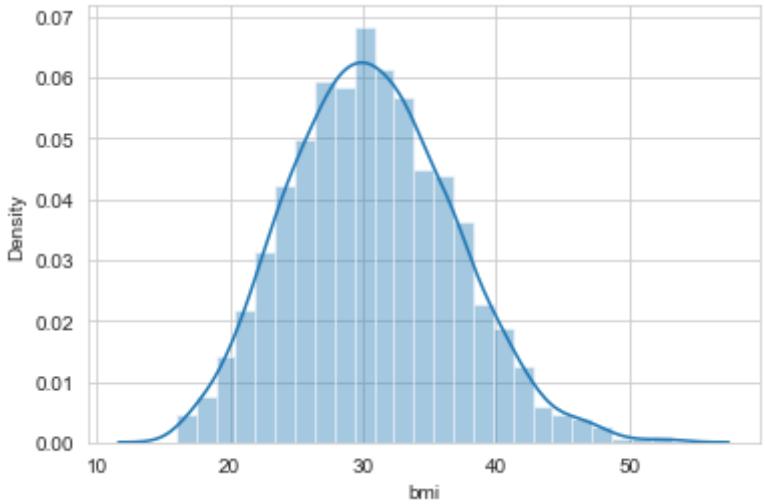
In [48]:
```
sns.boxplot(x="charges",y="kilo_durumu", data = data)
```

Out[48]:
```
<AxesSubplot:xlabel='charges', ylabel='kilo_durumu'>
```



In [49]:
```
sns.distplot(data["bmi"])
```

Out[49]:
```
<AxesSubplot:xlabel='bmi', ylabel='Density'>
```

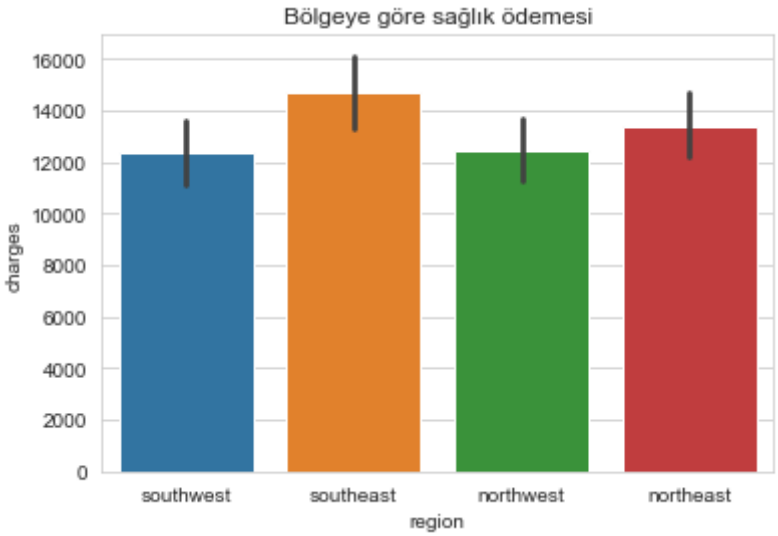


In [26]:
```
print("Ortalama BMI :{:.2f}".format(data["bmi"].mean()))
```

```
Ortalama BMI :30.66
```

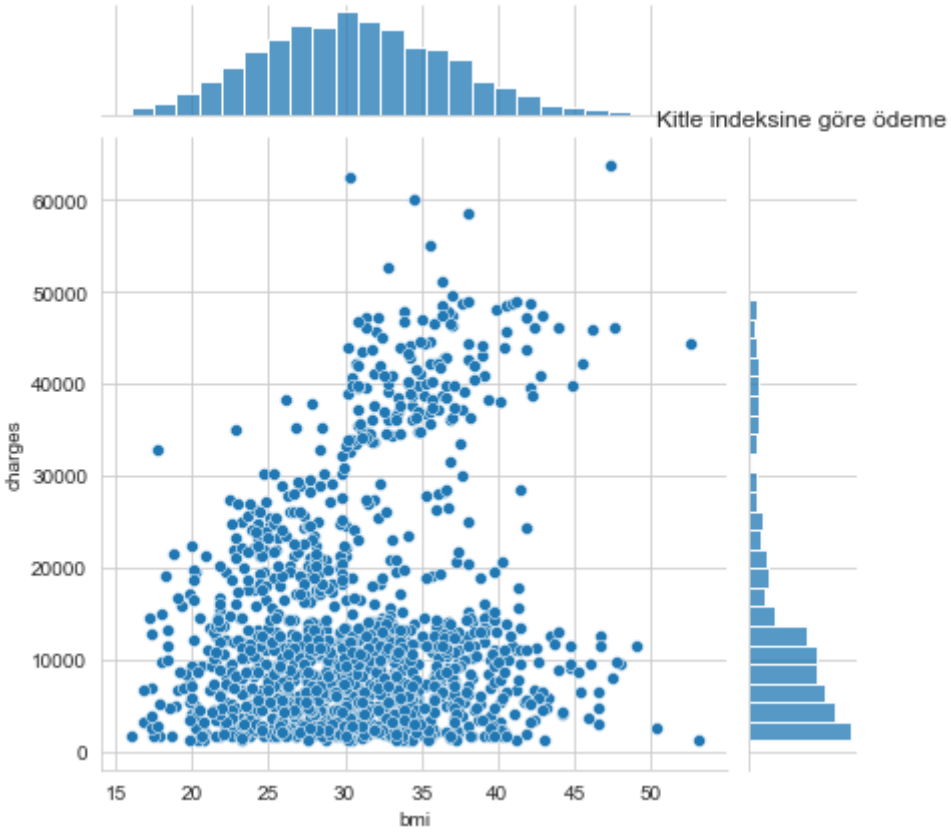
In [50]:
```
sns.barplot(x ="region", y="charges",data=data)
plt.title("Bölgeye göre sağlık ödemesi")
```

Out[50]:
```
Text(0.5, 1.0, 'Bölgeye göre sağlık ödemesi')
```



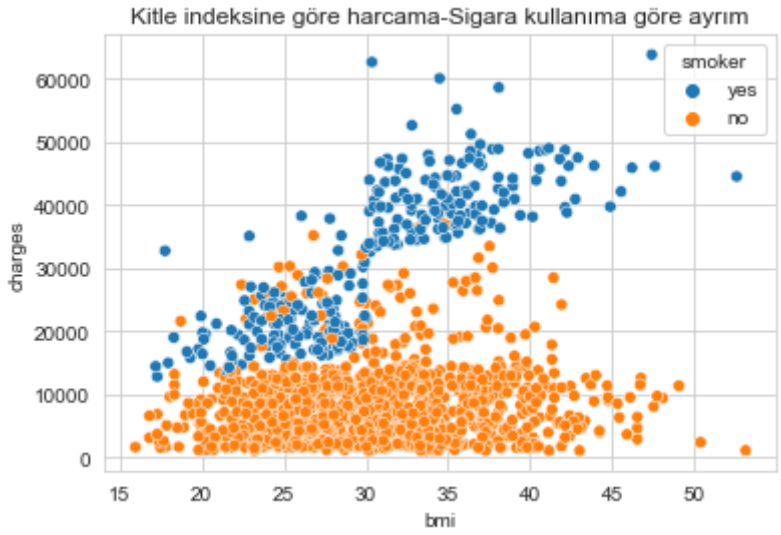
In [52]:
```
sns.jointplot(x="bmi",y="charges",data = data,kind="scatter")
plt.title("Kitle indeksine göre ödeme")
```

Out[52]:
```
Text(0.5, 1.0, 'Kitle indeksine göre ödeme')
```



In [53]:
```
sns.scatterplot(x="bmi", y="charges",data=data, hue="smoker")
plt.title("Kitle indeksine göre harcama-Sigara kullanıma göre ayrım")
```

Out[53]:
```
Text(0.5, 1.0, 'Kitle indeksine göre harcama-Sigara kullanıma göre ayrım')
```



In [43]:
```
ax = sns.pairplot(data, hue = 'smoker')
ax.fig.suptitle("Sigara içme durumuna göre genel tablo",y=1.02)
```

Out[43]:
```
Text(0.5, 1.02, 'Sigara içme durumuna göre genel tablo')
```

In [ ]: