[3]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

from sklearn.preprocessing import StandardScaler, LabelEncoder
from sklearn.decomposition import PCA
```

•[5]:
```
# Load CSV file
df = pd.read_csv("C:\Users\ayham\Desktop\Upwork_Project\data/all_upwork_jobs_2024-02-07-2024-03-24.csv")
```

[7]:
```
# Make a copy
encoded_df = df.copy()
```

[9]:
```
label_encoders = {}

for col in encoded_df.columns:
    if encoded_df[col].dtype == "object":
        le = LabelEncoder()
        encoded_df[col] = le.fit_transform(encoded_df[col].astype(str))
        label_encoders[col] = le

print("Encoding tamamlandı.")
```

```
Encoding tamamlandı.
```

[11]:
```
encoded_df = encoded_df.fillna(encoded_df.mean(numeric_only=True))

print("NaN temizlendi.")
```

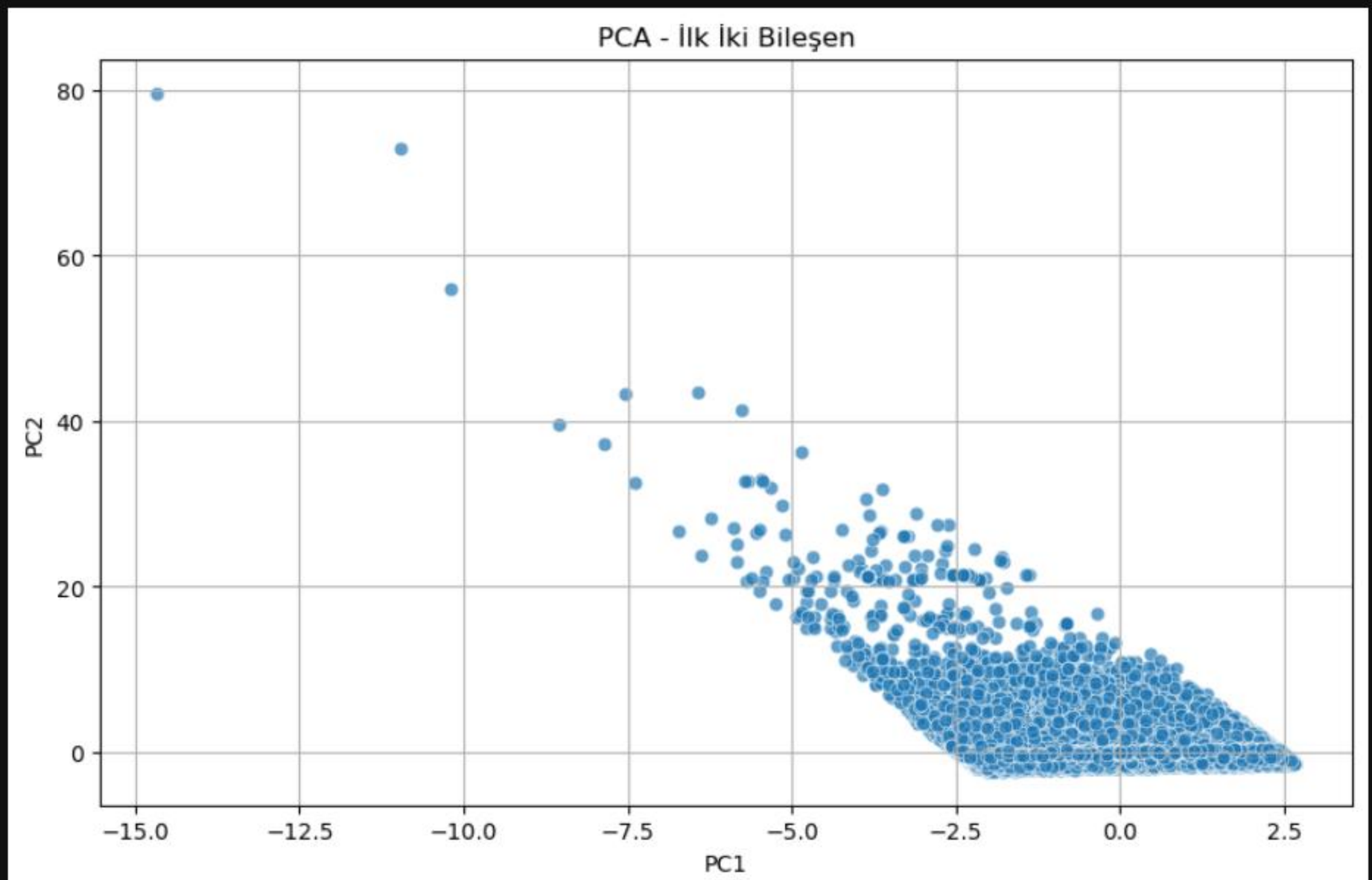
```
NaN temizlendi.
```

[13]:
```
scaler = StandardScaler()
scaled_data = scaler.fit_transform(encoded_df)
```

[15]:
```
pca = PCA(n_components=2)
pca_result = pca.fit_transform(scaled_data)

df_pca = pd.DataFrame(pca_result, columns=["PC1", "PC2"])
```

[17]:
```
plt.figure(figsize=(10,6))
sns.scatterplot(data=df_pca, x="PC1", y="PC2", s=40, alpha=0.7)
plt.title("PCA - İlk İki Bileşen")
plt.grid(True)
plt.show()
```



[19]:
```
print("Explained Variance Ratio:", pca.explained_variance_ratio_)
```

```
Explained Variance Ratio: [0.2320553  0.20405046]
```