

Day 30

Customer Lifetime Value Analysis using Python

```
In [1]: import pandas as pd
import plotly.graph_objs as go
import plotly.express as px
import plotly.io as pio
pio.templates.default = "plotly_white"
```

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

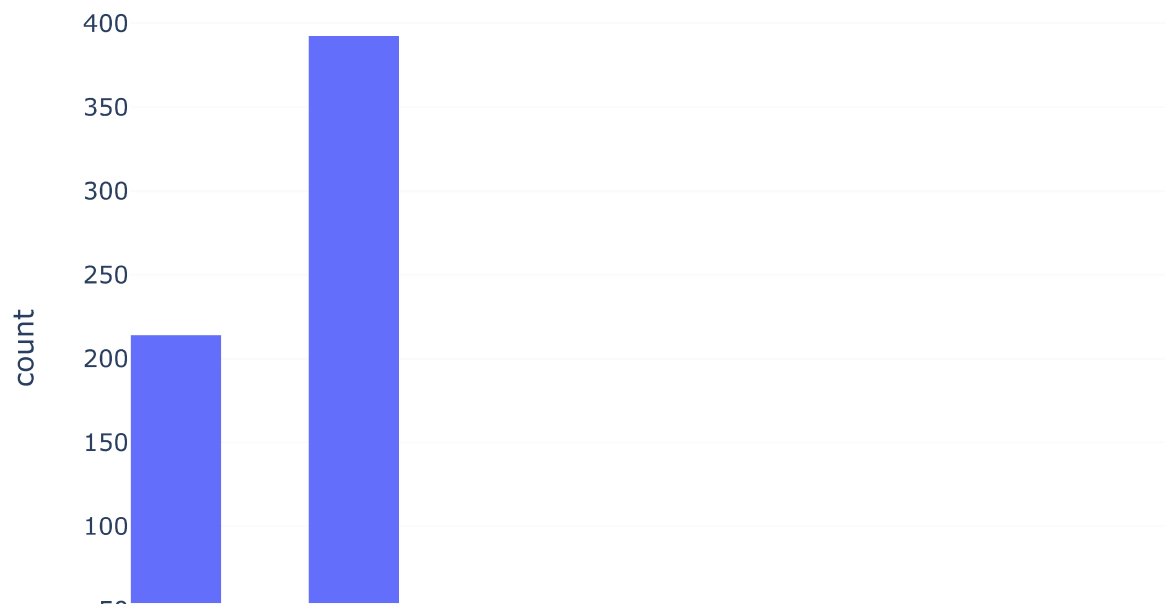
Out[2]:

	customer_id	channel	cost	conversion_rate	revenue
0	1	referral	8.320327	0.123145	4199
1	2	paid advertising	30.450327	0.016341	3410
2	3	email marketing	5.246263	0.043822	3164
3	4	social media	9.546326	0.167592	1520
4	5	referral	8.320327	0.123145	2419

visualizing the distribution of acquisition cost and revenue generated by the customer using histograms:

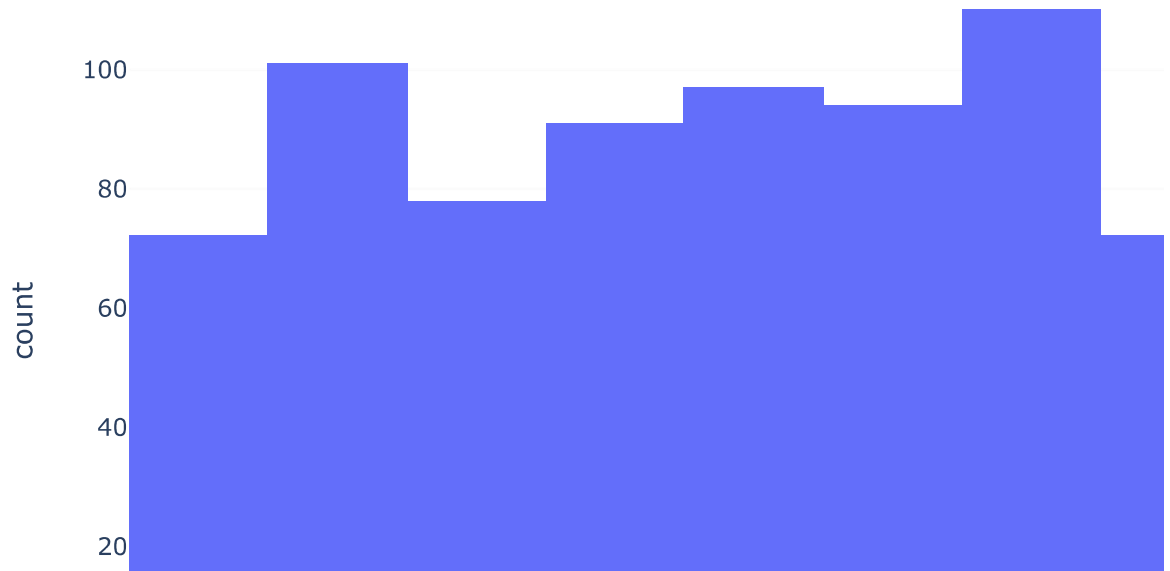
```
In [3]: fig = px.histogram(data,  
                           x="cost",  
                           nbins=20,  
                           title='Distribution of Acquisition Cost')  
fig.show()
```

Distribution of Acquisition Cost



```
In [4]: fig = px.histogram(data,  
                           x="revenue",  
                           nbins=20,  
                           title='Distribution of Revenue')  
fig.show()
```

Distribution of Revenue

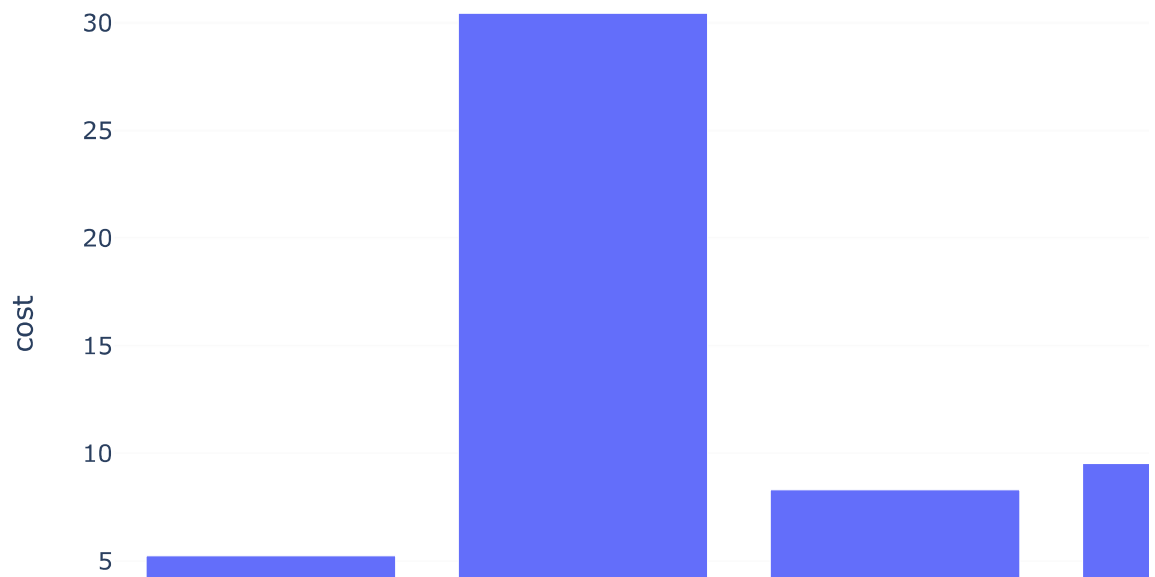


let's compare the cost of acquisition across different channels and identify the most and least profitable channels:

```
In [5]: cost_by_channel = data.groupby('channel')['cost'].mean().reset_index()

fig = px.bar(cost_by_channel,
             x='channel',
             y='cost',
             title='Customer Acquisition Cost by Channel')
fig.show()
```

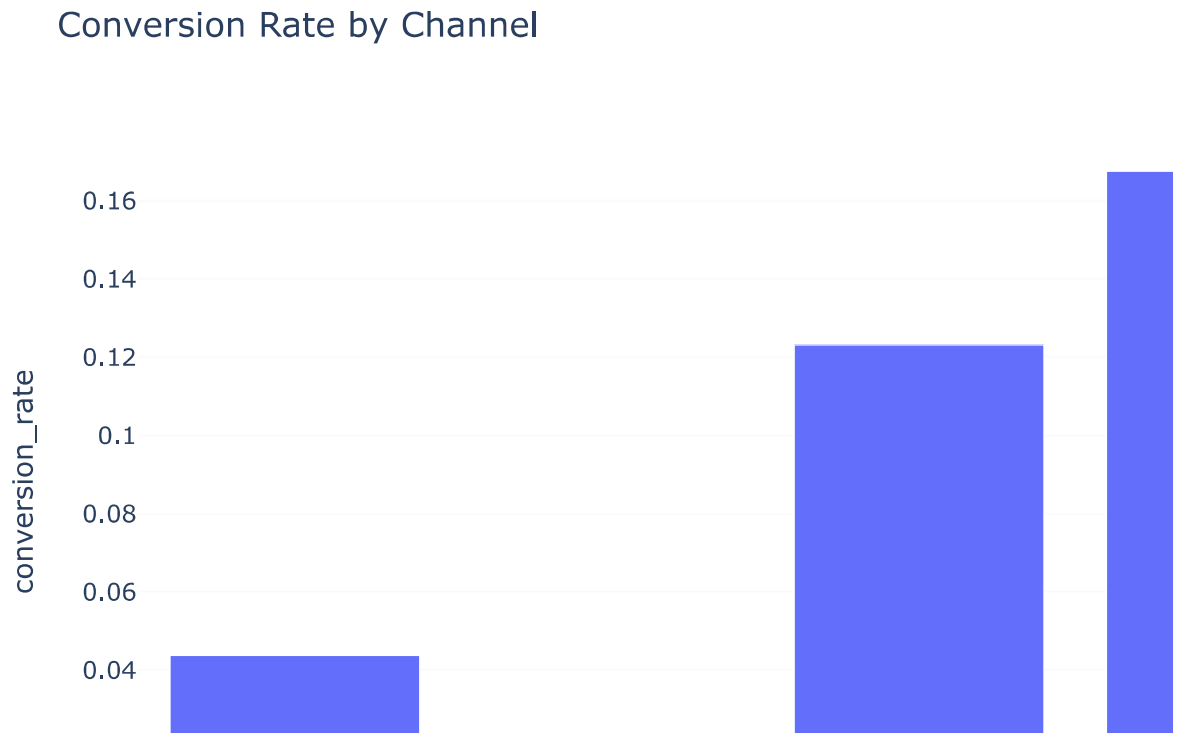
Customer Acquisition Cost by Channel



Now let's see which channels are most and least effective at converting customers:

```
In [6]: conversion_by_channel = data.groupby('channel')['conversion_rate'].mean().reset_index()

fig = px.bar(conversion_by_channel, x='channel',
              y='conversion_rate',
              title='Conversion Rate by Channel')
fig.show()
```



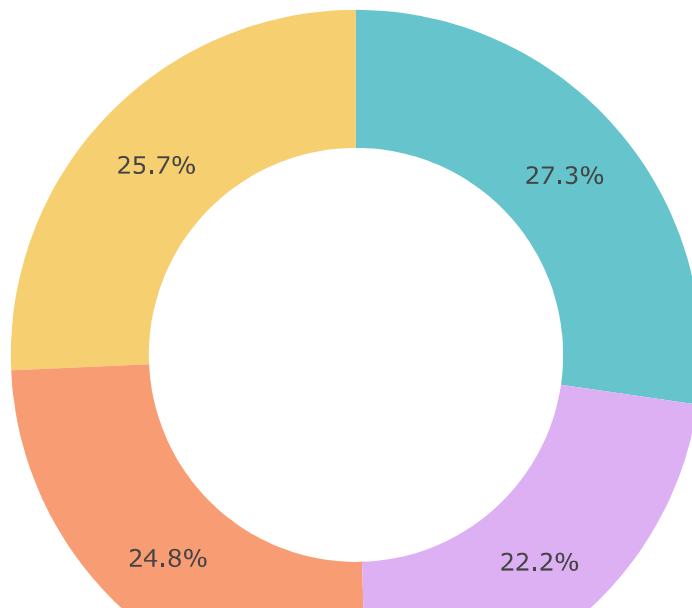
Now let's calculate the total revenue by channel and have a look at the most and least profitable channels in terms of generating revenue

```
In [7]: revenue_by_channel = data.groupby('channel')['revenue'].sum().reset_index()

fig = px.pie(revenue_by_channel,
             values='revenue',
             names='channel',
             title='Total Revenue by Channel',
             hole=0.6, color_discrete_sequence=px.colors.qualitative.Pastel)

fig.show()
```

Total Revenue by Channel

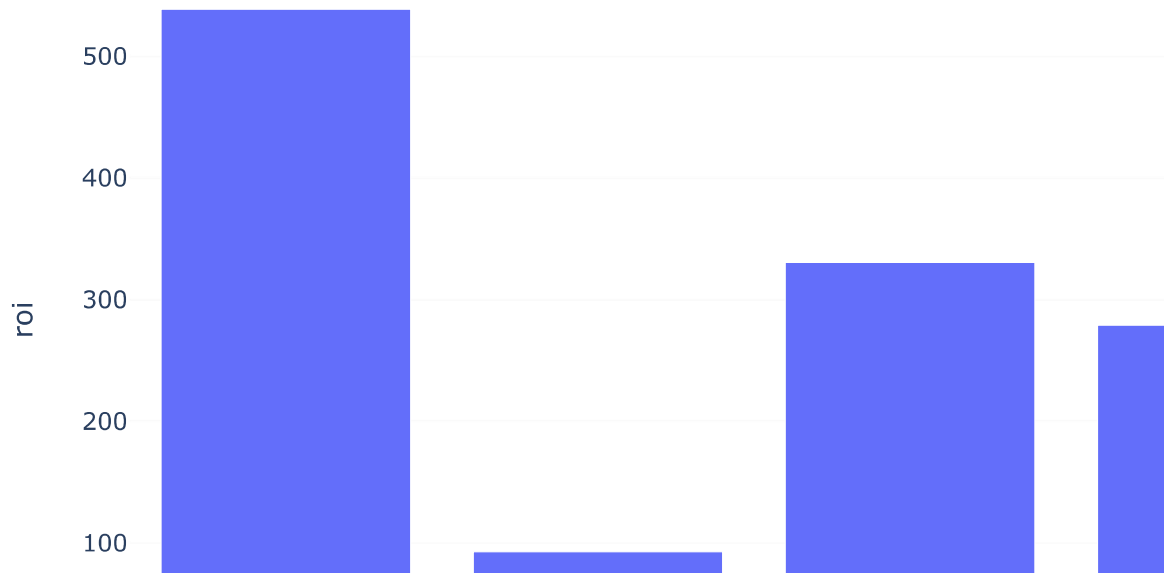


Now let's calculate the return on investment (ROI) for each channel:

```
In [8]: data['roi'] = data['revenue'] / data['cost']
roi_by_channel = data.groupby('channel')['roi'].mean().reset_index()

fig = px.bar(roi_by_channel,
              x='channel',
              y='roi', title='Return on Investment (ROI) by Channel')
fig.show()
```

Return on Investment (ROI) by Channel



In []:

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