Marketing_Funnel_Conversion_Analysis

```
Start coding or generate with AI.
```

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```
df = pd.read_csv("bank_marketing.csv")
```

```
df.head()
```

	age	job	marital	education	default	balance	housing	loan	contact	day	month	duration	campaign	pdays	pre
0	30	unemployed	married	primary	no	1787	no	no	cellular	19	oct	79	1	-1	
1	33	services	married	secondary	no	4789	yes	yes	cellular	11	may	220	1	339	
2	35	management	single	tertiary	no	1350	yes	no	cellular	16	apr	185	1	330	
3	30	management	married	tertiary	no	1476	yes	yes	unknown	3	jun	199	4	-1	
4	59	blue-collar	married	secondary	no	0	yes	no	unknown	5	may	226	1	-1	

Next steps: Generate code with df | New interactive sheet

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4521 entries, 0 to 4520
Data columns (total 17 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   age        4521 non-null   int64
 1   job        4521 non-null   object
 2   marital    4521 non-null   object
 3   education  4521 non-null   object
 4   default    4521 non-null   object
 5   balance    4521 non-null   int64
 6   housing    4521 non-null   object
 7   loan       4521 non-null   object
 8   contact    4521 non-null   object
 9   day        4521 non-null   int64
 10  month      4521 non-null   object
 11  duration   4521 non-null   int64
 12  campaign   4521 non-null   int64
 13  pdays      4521 non-null   int64
 14  previous   4521 non-null   int64
 15  poutcome   4521 non-null   object
 16  y          4521 non-null   object
dtypes: int64(7), object(10)
memory usage: 600.6+ KB
```

```
total_contacts = len(df)
```

```
engaged_users = df[df["duration"] > 0].shape[0]
```

```
converted_users = df[df["y"] == "yes"].shape[0]
```

```
total_contacts
engaged_users
converted_users
```

```
521
```

```
funnel_df = pd.DataFrame({
    "Stage": ["Contacted", "Engaged", "Converted"],
    "Users": [total_contacts, engaged_users, converted_users]
})
```

```
funnel_df
```

	Stage	Users
0	Contacted	4521
1	Engaged	4521
2	Converted	521

Next steps: Generate code with funnel_df | New interactive sheet

```
engagement_rate = (engaged_users / total_contacts) * 100
```

```
conversion_rate = (converted_users / engaged_users) * 100
```

```
print(f"Engagement Rate: {engagement_rate:.2f}%")
print(f"Conversion Rate: {conversion_rate:.2f}%")
```

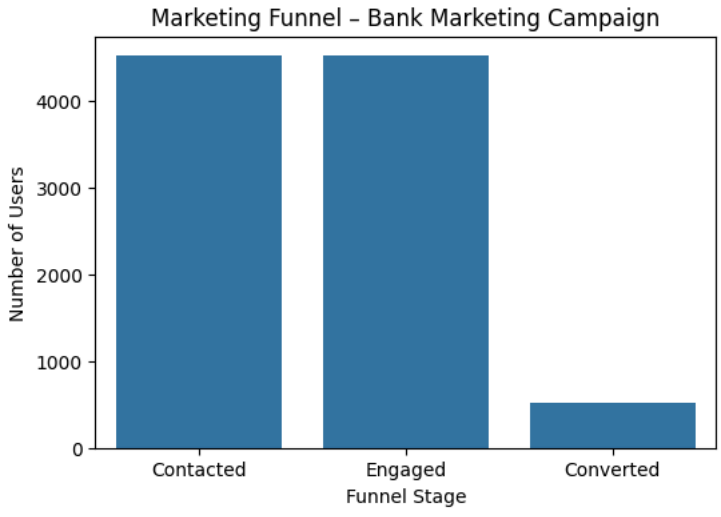
```
Engagement Rate: 100.00%
Conversion Rate: 11.52%
```

```
dropoff_contact_to_engaged = 100 - engagement_rate
dropoff_engaged_to_converted = 100 - conversion_rate

print(f"Drop-off (Contact → Engaged): {dropoff_contact_to_engaged:.2f}%")
print(f"Drop-off (Engaged → Converted): {dropoff_engaged_to_converted:.2f}%")
```

```
Drop-off (Contact → Engaged): 0.00%
Drop-off (Engaged → Converted): 88.48%
```

```
plt.figure(figsize=(6,4))
sns.barplot(x="Stage", y="Users", data=funnel_df)
plt.title("Marketing Funnel – Bank Marketing Campaign")
plt.ylabel("Number of Users")
plt.xlabel("Funnel Stage")
plt.show()
```



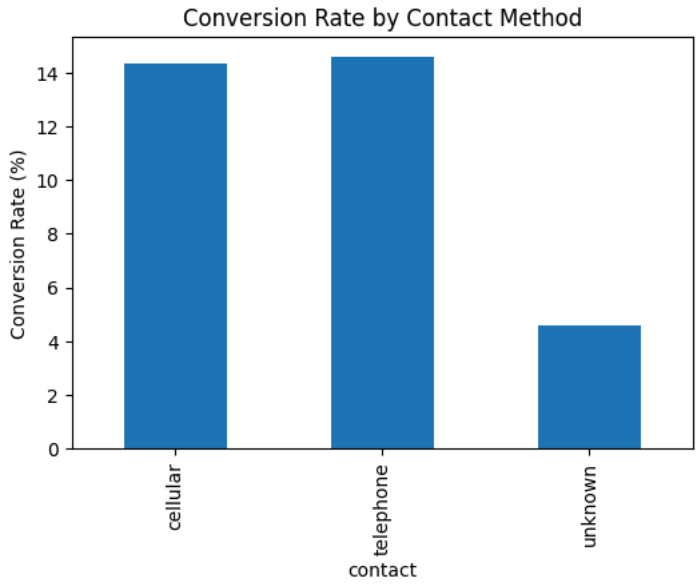

```
conversion_by_contact = (
    df.groupby("contact")["y"]
    .value_counts(normalize=True)
    .unstack() * 100
)

conversion_by_contact
```

y	no	yes
contact		
cellular	85.635359	14.364641
telephone	85.382060	14.617940
unknown	95.392749	4.607251

Next steps: Generate code with conversion_by_contact | New interactive sheet

```
conversion_by_contact["yes"].plot(kind="bar", figsize=(6,4))
plt.title("Conversion Rate by Contact Method")
plt.ylabel("Conversion Rate (%)")
plt.show()
```



Key Insights

- Significant drop-off occurs between engagement and conversion
- Not all engaged users convert
- Certain contact methods perform better
- Funnel optimization is needed at conversion stage

Recommendations

- Improve follow-up strategy after engagement
- Focus campaigns on high-converting contact methods
- Refine targeting to improve lead quality
- Optimize conversion messaging

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