instagram_reach_analysis

December 23, 2025

1 Instagram Reach Analysis using Python

[17]:
```
pip install wordcloud
```

```
Requirement already satisfied: wordcloud in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (1.9.4)
Requirement already satisfied: numpy>=1.6.1 in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from wordcloud) (2.0.1)
Requirement already satisfied: pillow in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from wordcloud) (11.1.0)
Requirement already satisfied: matplotlib in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from wordcloud) (3.10.0)
Requirement already satisfied: contourpy>=1.0.1 in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from
matplotlib->wordcloud) (1.3.1)
Requirement already satisfied: cycler>=0.10 in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from
matplotlib->wordcloud) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from
matplotlib->wordcloud) (4.58.1)
Requirement already satisfied: kiwisolver>=1.3.1 in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from
matplotlib->wordcloud) (1.4.8)
Requirement already satisfied: packaging>=20.0 in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from
matplotlib->wordcloud) (25.0)
Requirement already satisfied: pyparsing>=2.3.1 in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from
matplotlib->wordcloud) (3.2.3)
Requirement already satisfied: python-dateutil>=2.7 in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from
matplotlib->wordcloud) (2.9.0.post0)
Requirement already satisfied: six>=1.5 in /home/ochwo-edrian-
jude/miniconda3/envs/ds4b/lib/python3.11/site-packages (from python-
dateutil>=2.7->matplotlib->wordcloud) (1.17.0)
Note: you may need to restart the kernel to use updated packages.
```

[22]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
from wordcloud import WordCloud, STOPWORDS, ImageColorGenerator
from sklearn.model_selection import train_test_split
from sklearn.linear_model import PassiveAggressiveRegressor
```

[24]:
```
data = pd.read_csv("Instagram.csv", encoding = "latin1")
print(data.head())
```

```
   Impressions  From Home  From Hashtags  From Explore  From Other  Saves
Comments  Shares  Likes  Profile Visits  Follows
Caption
Hashtags
0         3920       2586           1028           619          56     98
9       5    162              35        2
Here are some of the most important data visualizations that every Financial
Data Analyst/Scientist should know.
#finance #money #business #investing #investment #trading #stockmarket #data #da
tascience #dataanalysis #dataanalytics #datascientist #machinelearning #python #
pythonprogramming #pythonprojects #pythoncode #artificialintelligence #ai #dataa
nalyst #amankharwal #thecleverprogrammer
1         5394       2727           1838          1174          78    194
7      14    224              48       10                 Here are some of the
best data science project ideas on healthcare. If you want to become a data
science professional in the healthcare domain then you must try to work on these
projects.
#healthcare #health #covid #data #datascience #dataanalysis #dataanalytics #data
scientist #machinelearning #python #pythonprogramming #pythonprojects #pythoncod
e #artificialintelligence #ai #dataanalyst #amankharwal #thecleverprogrammer
2         4021       2085           1188             0         533     41
11       1    131              62       12
Learn how to train a machine learning model and giving inputs to your trained
model to make predictions using Python.
#data #datascience #dataanalysis #dataanalytics #datascientist #machinelearning
#python #pythonprogramming #pythonprojects #pythoncode #artificialintelligence #
ai #deeplearning #machinelearningprojects #datascienceprojects #amankharwal #the
cleverprogrammer #machinelearningmodels
3         4528       2700            621           932          73    172
10       7    213              23        8  Here s how you can write a Python
program to detect whether a sentence is a question or not. The idea here is to
find the words that we see in the beginning of a question in the beginning of a
sentence.
#python #pythonprogramming #pythonprojects #pythoncode #pythonlearning #pythonde
veloper #pythoncoding #pythonprogrammer #amankharwal #thecleverprogrammer #pytho
nprojects
```

```
4         2518       1704            255           279          37     96
5       4    123               8        0                          Plotting
annotations while visualizing your data is considered good practice to make the
graphs self-explanatory. Here is an example of how you can annotate a graph
using Python.  #datavisualization #datascience #data #dataanalytics #machinelear
ning #dataanalysis #artificialintelligence #python #datascientist #bigdata #deep
learning #dataviz #ai #analytics #technology #dataanalyst #programming #pythonpr
ogramming #statistics #coding #businessintelligence #datamining #tech #business
#computerscience #tableau #database #thecleverprogrammer #amankharwal
```

[25]:
```
data.isnull().sum()
```

[25]:
```
Impressions       0
From Home         0
From Hashtags     0
From Explore      0
From Other        0
Saves             0
Comments          0
Shares            0
Likes             0
Profile Visits    0
Follows           0
Caption           0
Hashtags          0
dtype: int64
```

[5]:
```
data = data.dropna()
```

[26]:
```
data.info()
```

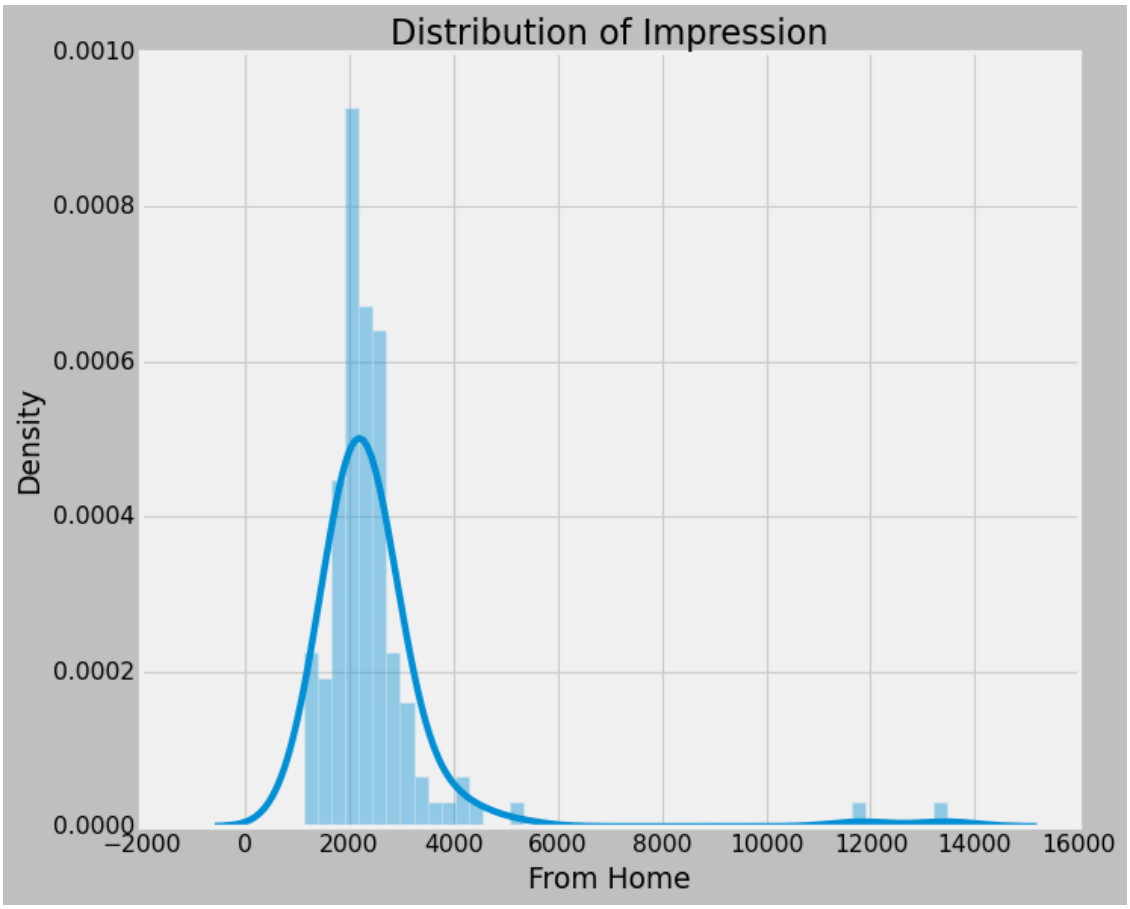
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 119 entries, 0 to 118
Data columns (total 13 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Impressions     119 non-null    int64
 1   From Home       119 non-null    int64
 2   From Hashtags   119 non-null    int64
 3   From Explore    119 non-null    int64
 4   From Other      119 non-null    int64
 5   Saves           119 non-null    int64
 6   Comments        119 non-null    int64
 7   Shares          119 non-null    int64
 8   Likes           119 non-null    int64
 9   Profile Visits  119 non-null    int64
 10  Follows         119 non-null    int64
 11  Caption         119 non-null    object
```

```
 12  Hashtags        119 non-null    object
dtypes: int64(11), object(2)
memory usage: 12.2+ KB
```

1.1 Analyzing Instagram Reach

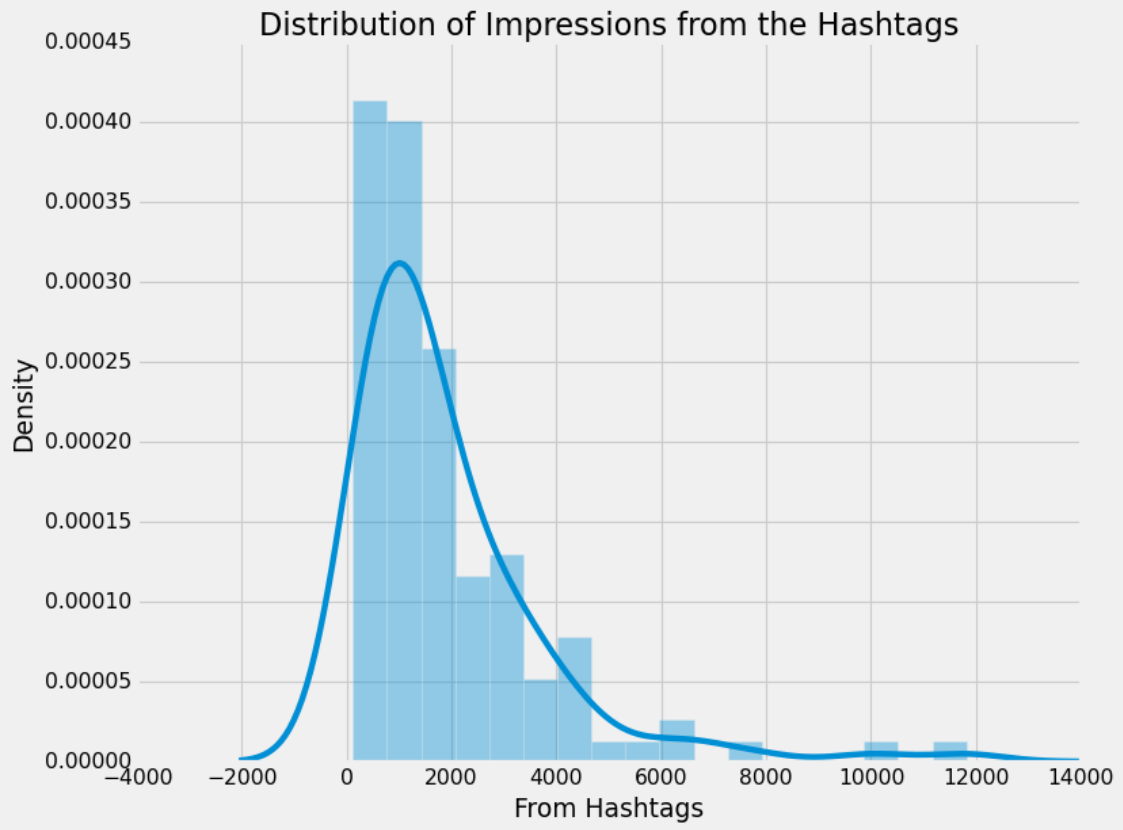
[27]:
```
plt.figure(figsize=(10, 8))
plt.style.use('fivethirtyeight')
plt.title("Distribution of Impression")
sns.distplot(data["From Home"])
plt.show()
```

```
/tmp/ipykernel_22848/1415715992.py:4: UserWarning:


`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```



[29]:
```
#Here is what is done
plt.figure(figsize = (10, 8))
plt.title("Distribution of Impressions from the Hashtags")
sns.distplot(data["From Hashtags"])
plt.show()
```

```
/tmp/ipykernel_22848/324734107.py:4: UserWarning:


`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```



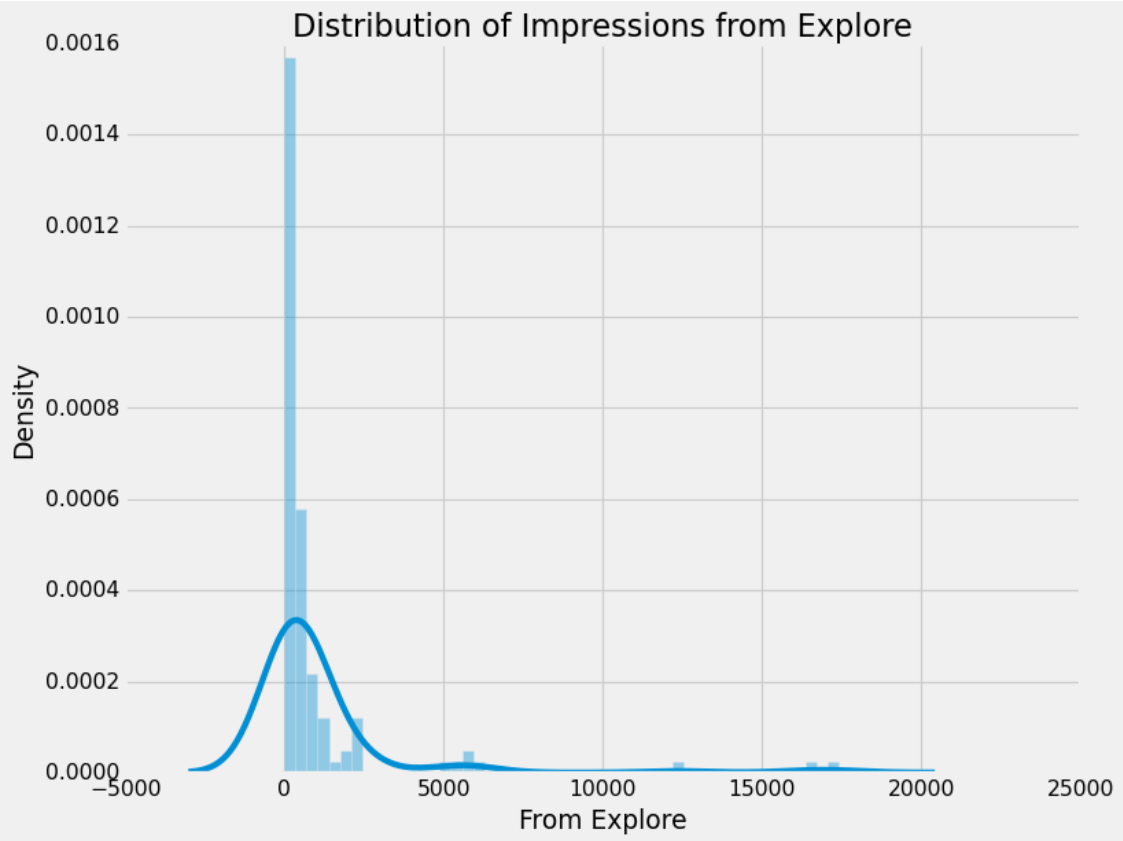
[9]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 119 entries, 0 to 118
Data columns (total 13 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Impressions     119 non-null    int64
 1   From Home       119 non-null    int64
 2   From Hashtags   119 non-null    int64
 3   From Explore    119 non-null    int64
 4   From Other      119 non-null    int64
 5   Saves           119 non-null    int64
 6   Comments        119 non-null    int64
 7   Shares          119 non-null    int64
 8   Likes           119 non-null    int64
 9   Profile Visits  119 non-null    int64
 10  Follows         119 non-null    int64
 11  Caption         119 non-null    object
 12  Hashtags        119 non-null    object
dtypes: int64(11), object(2)
```

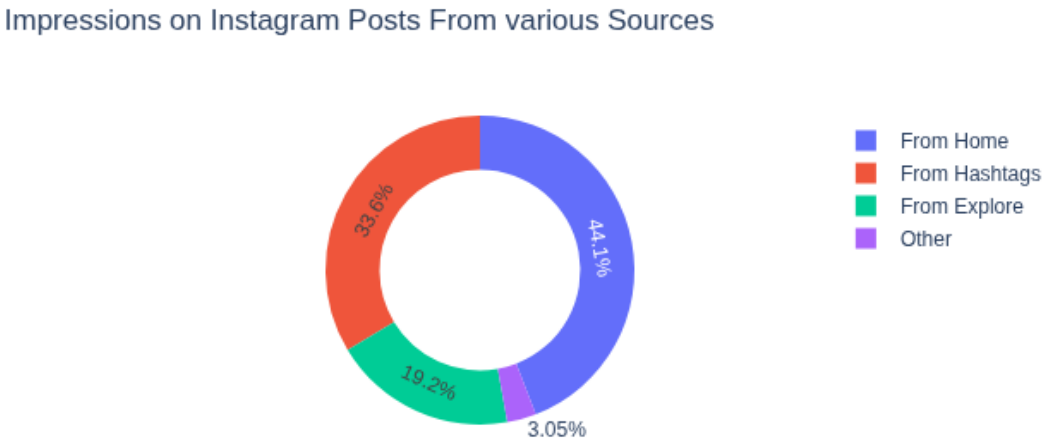
```
memory usage: 12.2+ KB
```

[30]:
```
plt.figure(figsize = (10, 8))
plt.title("Distribution of Impressions from Explore")
sns.distplot(data["From Explore"])
plt.show()
```

```
/tmp/ipykernel_22848/3711255542.py:3: UserWarning:


`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

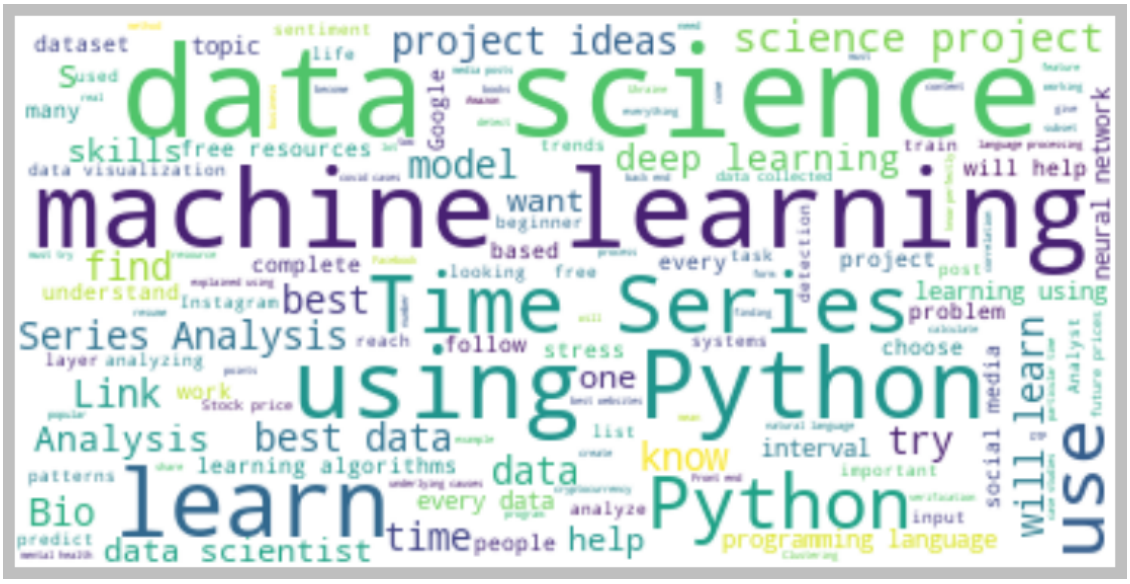


[31]:
```
home = data["From Home"].sum()
hashtags = data["From Hashtags"].sum()
explore = data["From Explore"].sum()
other = data["From Other"].sum()

labels = ["From Home", "From Hashtags", "From Explore", "Other"]
values = [home, hashtags, explore, other]

fig = px.pie(data, values=values, names=labels,
             title = "Impressions on Instagram Posts From various Sources",
             hole = 0.65)
fig.show()
```



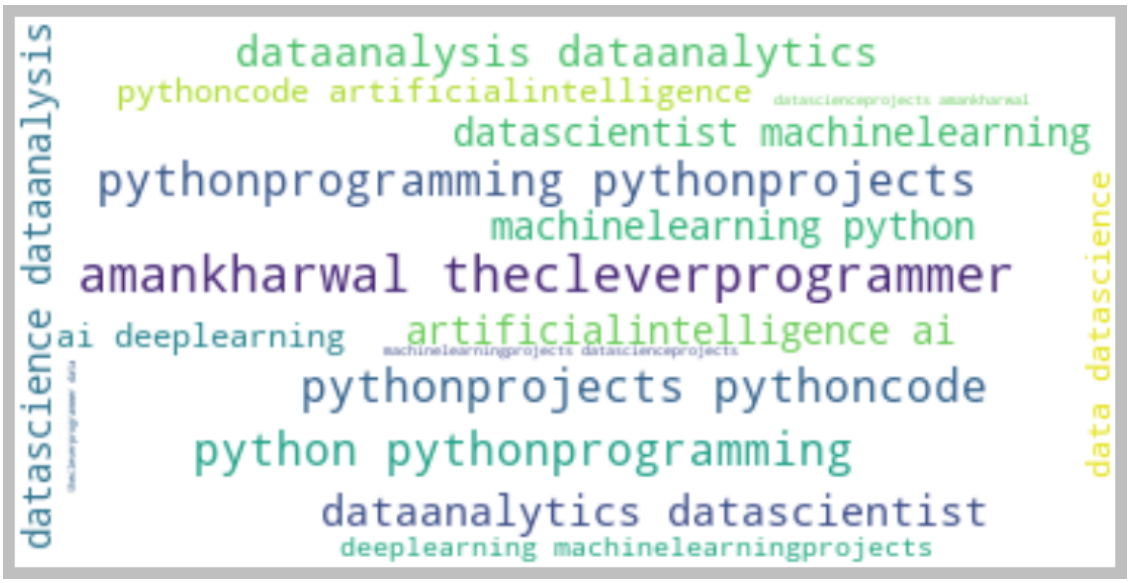
1.2 Analyse Content

[33]:
```
text = " ".join(i for i in data.Caption)
stopwords = set(STOPWORDS)
wordcloud = WordCloud(stopwords=stopwords, background_color="white").
 ↪generate(text)
plt.style.use('classic')
plt.figure(figsize=(12,10))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis("off")
plt.show()
```



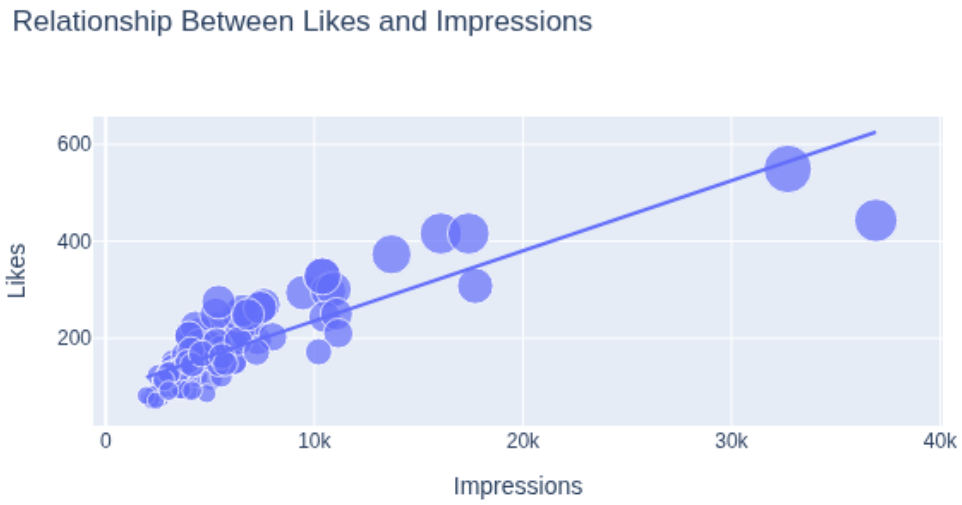
1.2.1 Analyse the most used Hashtags in my Instagram posts

[34]:
```
text = " ".join(i for i in data.Hashtags)
stopwords = set(STOPWORDS)
wordcloud = WordCloud(stopwords=stopwords, background_color="white").
 ↪generate(text)
plt.figure(figsize=(12,10))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis("off")
plt.show()
```



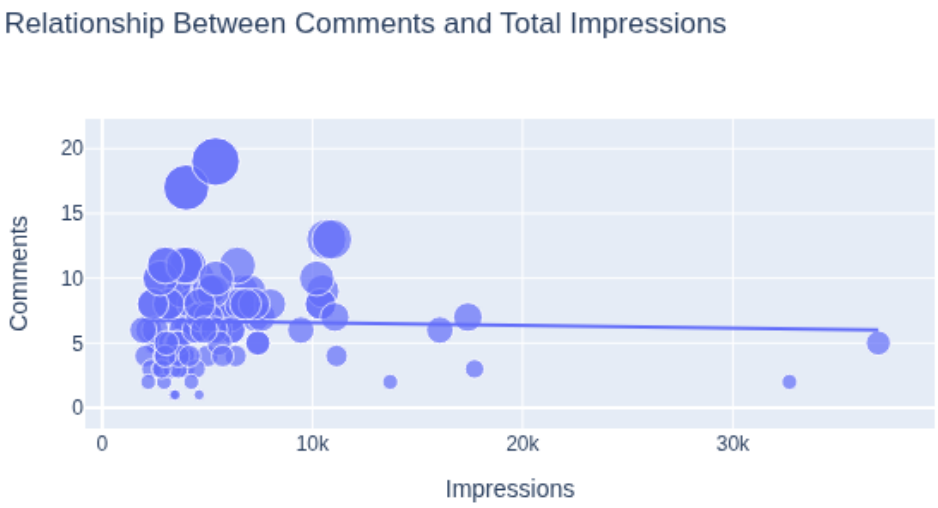
1.3 Analyzing Relationships Other

[35]:
```
figure = px.scatter(data_frame = data, x ="Impressions",
                    y = "Likes", size="Likes", trendline = "ols",
                    title = "Relationship Between Likes and Impressions")
figure.show()
```



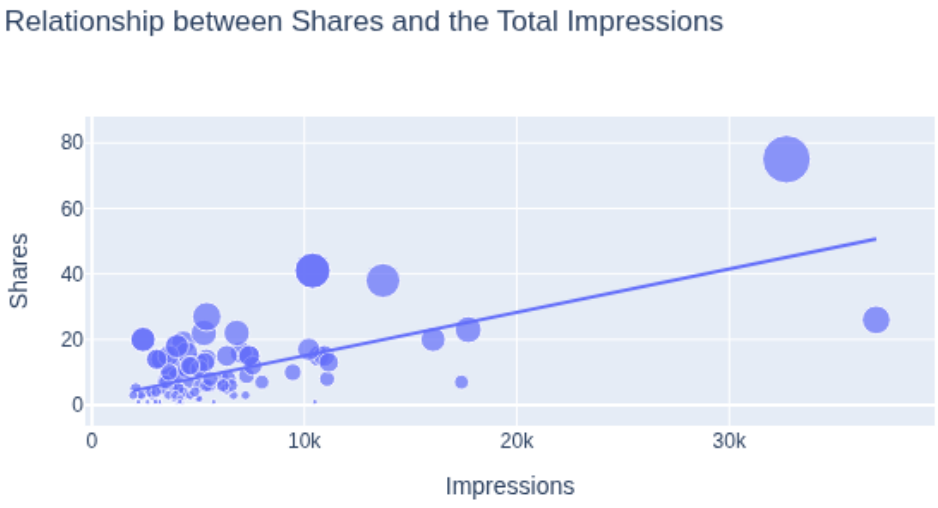
1.4 Relationship betwwen the number of Comments and the Impressions for the posts

[36]:
```
figure = px.scatter(data_frame=data, x="Impressions",
                    y="Comments", size="Comments", trendline="ols",
                    title="Relationship Between Comments and Total Impressions")
figure.show()
```

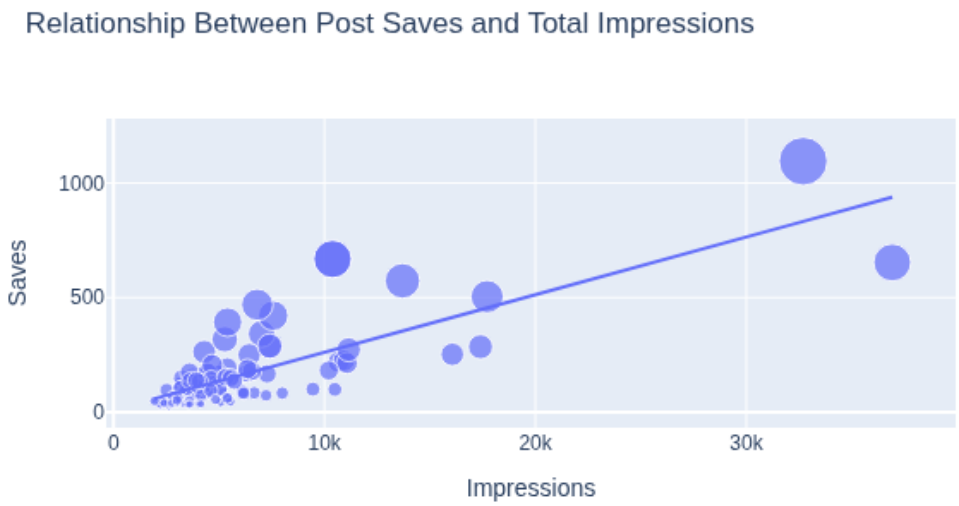


1.4.1 Relationship between the number of shares and the Impressions

[39]:
```
figure = px.scatter(data_frame = data, x = "Impressions",
                    y = "Shares", size = "Shares", trendline = "ols",
                     title = "Relationship between Shares and the Total␣
 ↪Impressions")
figure.show()
```



[40]:
```
figure = px.scatter(data_frame = data, x = "Impressions",
                    y= "Saves", size = "Saves", trendline = "ols",
                    title = "Relationship Between Post Saves and Total␣
 ↪Impressions")
figure.show()
```



[46]:
```
correlation  = data.select_dtypes(exclude=object).corr()
print(correlation["Impressions"]).sort_values(ascending=False)
```

```
Impressions       1.000000
From Home         0.844698
From Hashtags     0.560760
From Explore      0.893607
From Other        0.592960
Saves             0.779231
Comments         -0.028524
Shares            0.634675
Likes             0.849835
Profile Visits    0.760981
Follows           0.889363
Name: Impressions, dtype: float64
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
```

```
Cell In[46], line 2
      1 correlation  = data.select_dtypes(exclude=object).corr()
----> 2 print(correlation[             ]).sort_values(ascending=False)

AttributeError: 'NoneType' object has no attribute 'sort_values'
```

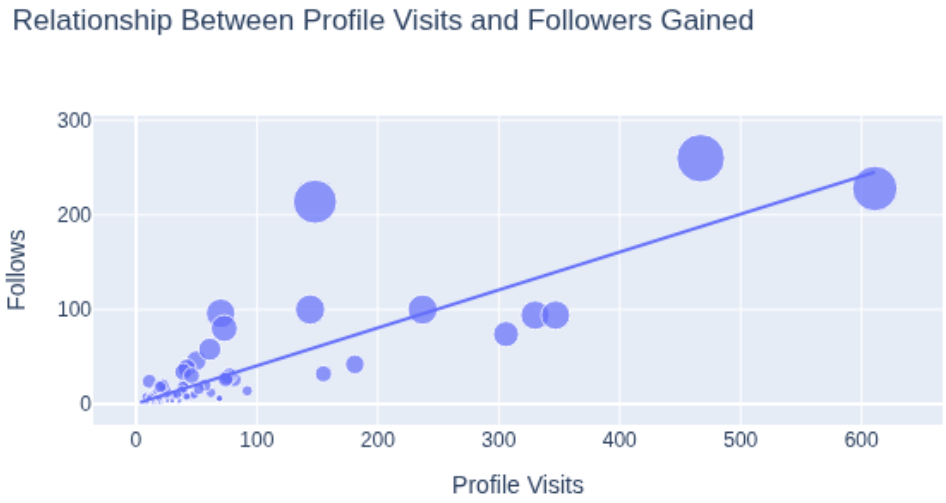
1.5 Analyze the Conversion Rate

Coversion rate can be defined as the number of followers that you get from the number of visits to the instagram profile

[48]:
```
conversion_rate = (data["Follows"].sum() / data["Profile Visits"].sum() * 100)
print(conversion_rate)
```

```
41.00265604249668
```

[50]:
```
# Total profile visits and the number of followers gained from the profile␣
 ↪visits
figure = px.scatter(data_frame=data, x = "Profile Visits",
                    y="Follows", size = "Follows", trendline = "ols",
                    title = "Relationship Between Profile Visits and Followers␣
 ↪Gained")
figure.show()
```



1.6 Instagram Reach Prediction Model

[51]:
```
x = np.array(data[["Likes","Saves","Comments","Shares",
                   "Profile Visits", "Follows"]])
y = np.array(data["Impressions"])
xtrain, xtest, ytrain, ytest = train_test_split(x, y,
                                                test_size=0.2,
                                                random_state=42)
```

[52]:
```
model = PassiveAggressiveRegressor()
model.fit(xtrain, ytrain)
model.score(xtest, ytest)
```

[52]:
```
0.8543604204145687
```

[53]:
```
#features = [["Likes", "Saves", "Comments", "Shares", "Profile Visits",␣
 ↪"Follows"]]
features = np.array([[282.0, 233.0, 4.0, 9.0, 165.0, 54.0]])
model.predict(features)
```

[53]:
```
array([11002.6384923])
```

[ ]:
```

```