In [2]:

```
import pandas as pd

tweets = pd.read_csv(r'C:\Users\daksh\Desktop\SMA Tweets\tweets_compress.csv')

tweets.head()
```

Out[2]:

	Unnamed: 0	Datetime	Tweet Id	Text	Username	
0	0	2022-03-07 13:04:28+00:00	1.500820e+18	I've just booked a two night stay in Kiev, Ukr...	chazsnell	https://twitter.cor
1	1	2022-03-04 17:50:00+00:00	1.499804e+18	Given #Russia’s considerable foreign exchange ...	orfonline	https://twitter.co
2	2	2022-03-04 18:53:43+00:00	1.499820e+18	Wow, one of my favorite actresses thank you mi...	AnaMelanyAmaya2	https://twitter.com/A
3	3	2022-03-20 22:01:08+00:00	1.505666e+18	Ukraine's Zelenskiy presses Israel for missile...	sightmagazine	https://twitter.cor
4	4	2022-03-08 22:32:50+00:00	1.501325e+18	European oil receipts boosting Putin’s war che...	MovieXen	https://twitter.com/

5 rows × 23 columns

In [15]:

```
tweets.head()
```

Out[15]:

	Datetime	Tweet Id	Text	Username	
0	2022-03-07 13:04:28+00:00	1.500820e+18	I've just booked a two night stay in Kiev, Ukr...	chazsnell	https://twitter.com/chazsnell/s
1	2022-03-04 17:50:00+00:00	1.499804e+18	Given #Russia's considerable foreign exchange ...	orfonline	https://twitter.com/orfonline/s
2	2022-03-04 18:53:43+00:00	1.499820e+18	Wow, one of my favorite actresses thank you mi...	AnaMelanyAmaya2	https://twitter.com/AnaMelanyAn
3	2022-03-20 22:01:08+00:00	1.505666e+18	Ukraine's Zelenskiy presses Israel for missile...	sightmagazine	https://twitter.com/sightmagaz
4	2022-03-08 22:32:50+00:00	1.501325e+18	European oil receipts boosting Putin's war che...	MovieXen	https://twitter.com/MovieXen/sta

5 rows × 22 columns

In [14]:

```
frequency_hashtags = tweets['hashtag'].value_counts()

frequency_hashtags
```

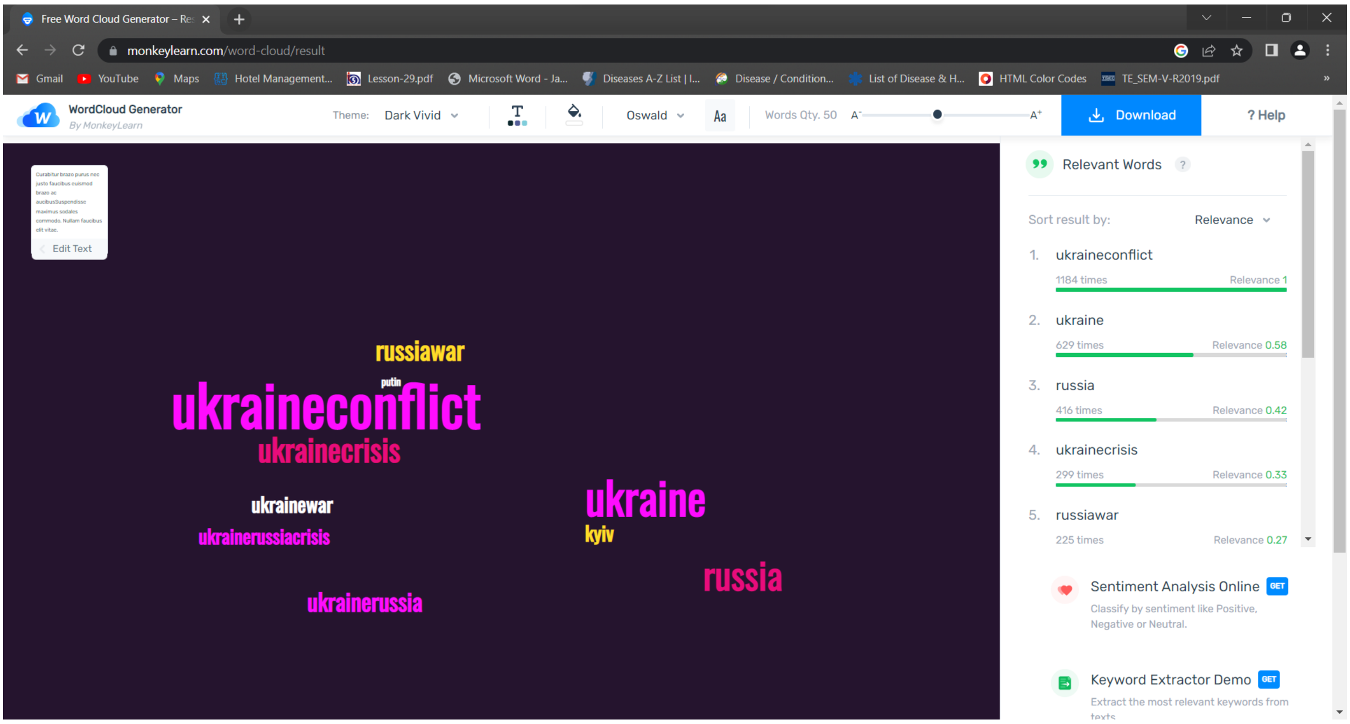
Out[14]:

```
['#ukraine', '#UkraineConflict', '#UkraineCrisis', '#UkraineRussiaConflic
t', '#UkraineRussiaCrisis', '#UkraineRussia', '#Russia', '#Russian', '#Kyi
v']                          163
['#UkraineConflict']
103
['#UkraineConflict.']
40
['#Russia', '#Ukraine', '#UkraineWar', '#RussiaWar', '#Europe', '#EU', '#N
ATO', '#US']
38
['#Russia', '#Ukraine', '#UkraineArmy', '#UkraineConflict', '#UkraineCrisi
s']
25

...
['#UkrainianRefugees', '#Poland.', '#UkraineRussia', '#UkraineInvasion',
'#ukraineconflict']
1
['#Ukraine', '#UkraineConflict', '#Putin', '#PutinWarCrimes', '#RussianUkr
ainianWar', '#Russia']
1
['#Russiawar', '#Natowar', '#NATO']
1
['#Ukraine', '#BOMB', '#ordinance', '#UnexplodedBomb', '#FKPTN', '#Ukraine
RussianWar', '#weapon', '#UkraineUnderAttack', '#UkraineConflict', '#Ukrai
nian', '#CloseTheSky']      1
['#Ukraine', '#Russia', '#UkraineConflict', '#Corruption', '#Zelenskyy',
'#Propaganda']
1
Name: hashtag, Length: 1101, dtype: int64
```

In [2]:

```
hashtags_highest_frequency = pd.read_csv(r'C:\Users\daksh\Desktop\SMA Tweets\wordcloud.c
```



Theme: Dark Vivid

Oswald

Words Qty. 50

Sort result by: Relevance

1. ukraineconflict
1184 times Relevance 1

2. ukraine
629 times Relevance 0.58

3. russia
416 times Relevance 0.42

4. ukrainecrisis
299 times Relevance 0.33

5. russiawar
225 times Relevance 0.27

Sentiment Analysis Online
Classify by sentiment like Positive, Negative or Neutral.

Keyword Extractor Demo
Extract the most relevant keywords from texts

```
In [3]:
```

```
hashtags_highest_frequency
```

```
Out[3]:
```

	word	count
0	ukraineconflict	1184
1	ukraine	629
2	russia	416
3	ukrainecrisis	299
4	russiawar	225
5	ukrainerussia	205
6	ukrainewar	176
7	kyiv	171
8	ukrainerussiacrisis	168
9	putin	101
10	ukraineunderattack	79
11	russiaukrainewar	75
12	nato	74
13	russiaukraine	69
14	ukraineinvasion	66
15	eu	61
16	europe	58
17	russianinvasion	46
18	us	42

In [6]:

```
node1 = []
node2 = []

for i in hashtags_highest_frequency['word']:
    for j in hashtags_highest_frequency['word']:
        if i == j:
            continue
        else:
            node1.append(i)
            node2.append(j)
```

In [7]:

```
print(node1)
print(node2)
```

```
['ukraineconflict', 'ukraineconflict', 'ukraineconflict', 'ukraineconflic
t', 'ukraineconflict', 'ukraineconflict', 'ukraineconflict', 'ukraineconfl
ict', 'ukraineconflict', 'ukraineconflict', 'ukraineconflict', 'ukrainecon
flict', 'ukraineconflict', 'ukraineconflict', 'ukraineconflict', 'ukrainec
onflict', 'ukraineconflict', 'ukraineconflict', 'ukraine', 'ukraine', 'ukr
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ssiacrisis', 'putin', 'ukraineunderattack', 'russiaukrainewar', 'nato', 'r
ussiaukraine', 'ukraineinvasion', 'europe', 'russianinvasion', 'us', 'ukra
ineconflict', 'ukraine', 'russia', 'ukrainecrisis', 'russiawar', 'ukrainer
```

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rainecrisis', 'russiawar', 'ukrainerussia', 'ukrainewar', 'kyiv', 'ukraine
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'russiaukrainewar', 'nato', 'russiaukraine', 'ukraineinvasion', 'eu', 'eur
ope', 'russianinvasion']
```

In [23]:

```python
edges_weights = []
```

In [24]:

```python
for i in range(len(hashtags_highest_frequency)):
    for j in range(len(hashtags_highest_frequency)):
        count = 0
        if hashtags_highest_frequency['word'][i] == hashtags_highest_frequency['word'][j
            continue
        else:
            for k in tweets['hashtag']:
                if hashtags_highest_frequency['word'][i] in k:
                    if hashtags_highest_frequency['word'][j] in k:
                        count+=1
            edges_weights.append(count)
#             print(j)
```

In [25]:

```python
len(edges_weights)
```

Out[25]:

```
342
```

In [26]:

```
graph = pd.DataFrame(
    {'Node1': node1,
     'Node2': node2,
     'Weight': edges_weights
    })
graph
```

Out[26]:

	Node1	Node2	Weight
0	ukraineconflict	ukraine	120
1	ukraineconflict	russia	42
2	ukraineconflict	ukrainecrisis	40
3	ukraineconflict	russiawar	4
4	ukraineconflict	ukrainerussia	22
...	...	...	...
337	us	russiaukraine	16
338	us	ukraineinvasion	3
339	us	eu	10
340	us	europe	2
341	us	russianinvasion	46

342 rows × 3 columns

In [1]:

```
import pandas as pd
import numpy as np
import networkx as nx
import matplotlib.pyplot as plt
```

```
C:\Users\daksh\anaconda3\lib\site-packages\scipy\__init__.py:138: UserWarn
ing: A NumPy version >=1.16.5 and <1.23.0 is required for this version of
SciPy (detected version 1.24.2)
  warnings.warn(f"A NumPy version >={np_minversion} and <{np_maxversion} i
s required for this version of "
```

In [28]:

```
graph.to_csv(r'C:\Users\daksh\Desktop\SMA Tweets\graph_nodes.csv')
```

In [29]:

```
rows_to_remove = graph[graph['Weight'] == 0].index
graph.drop(rows_to_remove, inplace=True)
```

In [30]:

```
graph
```

Out[30]:

	Node1	Node2	Weight
0	ukraineconflict	ukraine	120
1	ukraineconflict	russia	42
2	ukraineconflict	ukrainecrisis	40
3	ukraineconflict	russiawar	4
4	ukraineconflict	ukrainerussia	22
...	...	...	...
337	us	russiaukraine	16
338	us	ukraineinvasion	3
339	us	eu	10
340	us	europe	2
341	us	russianinvasion	46

210 rows × 3 columns

In [31]:

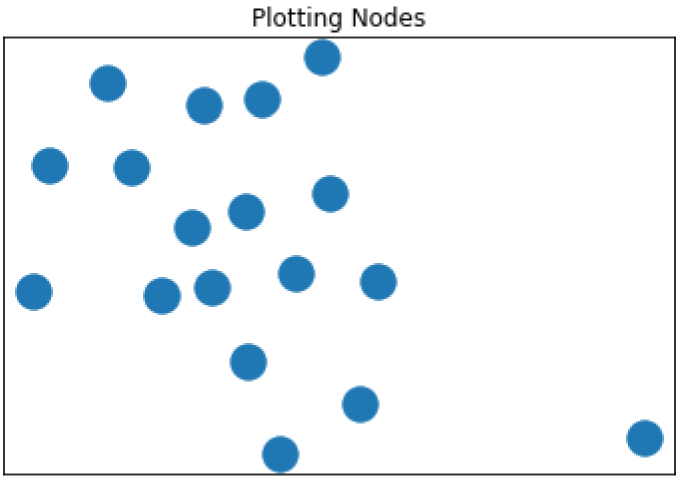
```
G = nx.from_pandas_edgelist(graph, source='Node1', target='Node2', edge_attr='Weight')
```

In [32]:

```
fig, ax = plt.subplots()
pos = nx.spring_layout(G)
plt.title("Plotting Nodes")
nx.draw_networkx_nodes(G, pos, ax = ax)
```

Out[32]:

```
<matplotlib.collections.PathCollection at 0x21b1b786dc0>
```

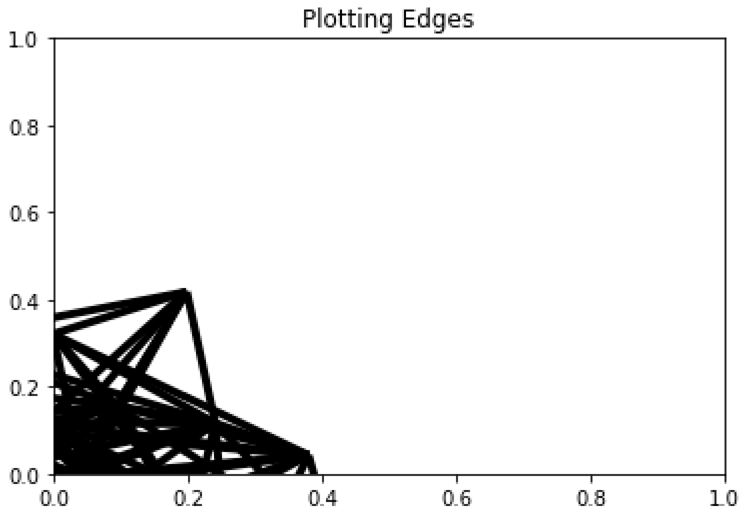


In [33]:

```
fig, ax = plt.subplots()
pos = nx.spring_layout(G)
plt.title("Plotting Edges")
nx.draw_networkx_edges(G, pos, width=4, ax=ax)
```

Out[33]:

```
<matplotlib.collections.LineCollection at 0x21b1d86ccd0>
```



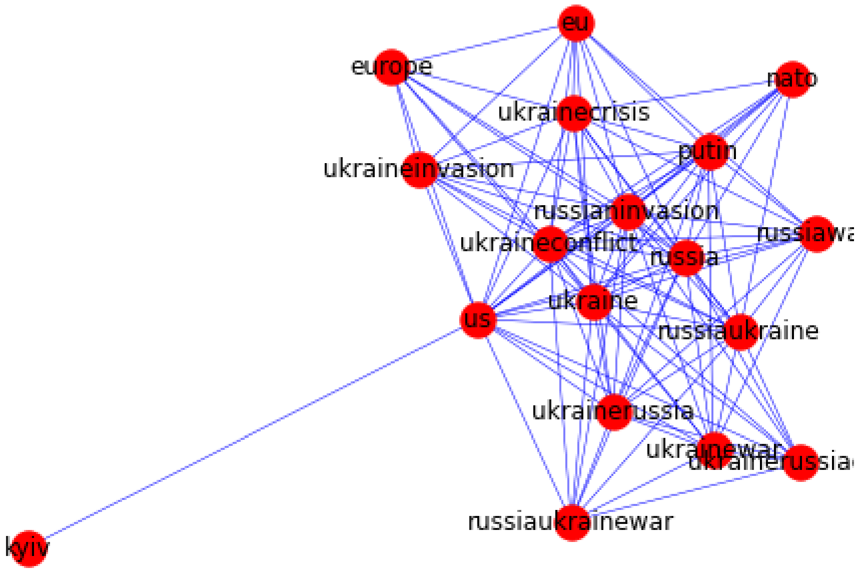
In [35]:

```
import networkx as nx

G = nx.from_pandas_edgelist(graph, source='Node1', target='Node2', edge_attr='Weight')
```

In [43]:

```
nx.draw(G, node_color='r', edge_color='blue', width=0.5, with_labels=True)
```

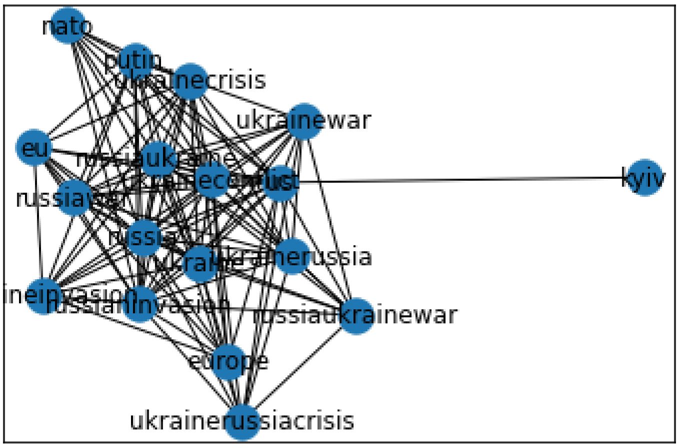


In [44]:

```
pos=nx.spring_layout(G) # pos = nx.nx_agraph.graphviz_layout(G)
nx.draw_networkx(G,pos)
labels = nx.get_edge_attributes(G, 'weight')
nx.draw_networkx_edge_labels(G,pos,edge_labels=labels)
```

Out[44]:

```
{}
```

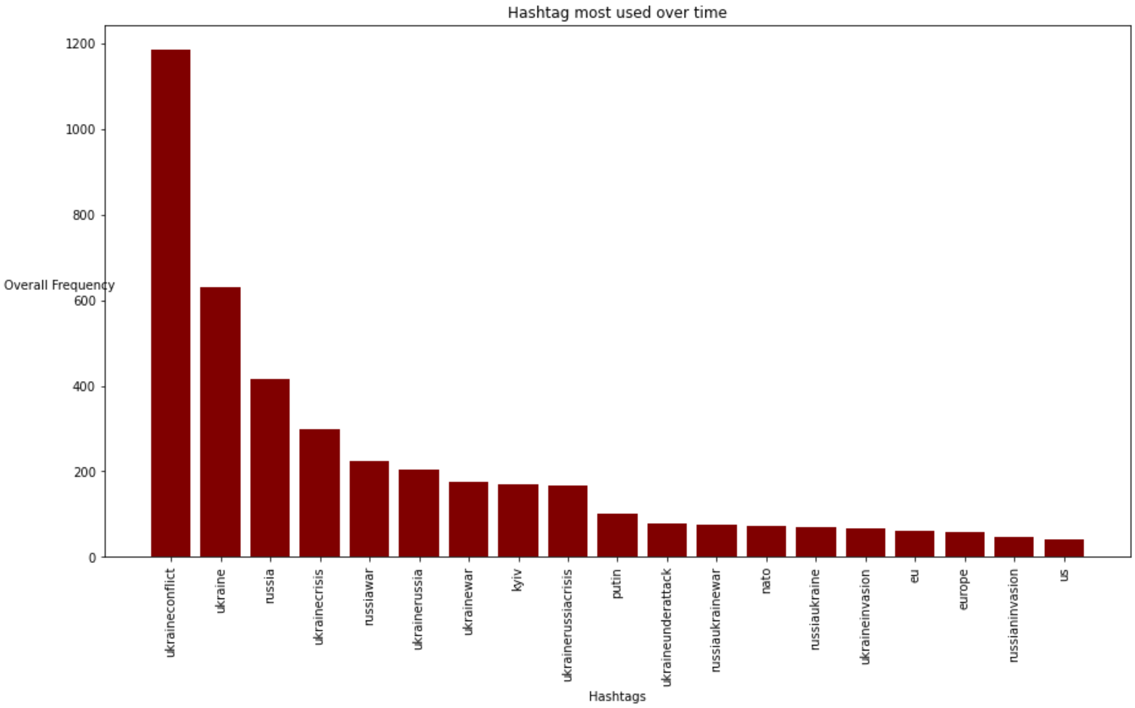


In [15]:

```
fig = plt.figure(figsize = (15, 8))

# creating the bar plot
plt.bar(hashtags_highest_frequency['word'], hashtags_highest_frequency['count'], color =
        width = 0.8)

plt.xlabel("Hashtags")
plt.xticks(rotation=90)
plt.ylabel("Overall Frequency", rotation='horizontal')
plt.title("Hashtag most used over time")
plt.show()
```


Hashtag most used over time
Overall Frequency
ukraineconflict
ukraine
russia
ukrainecrisis
russiawar
ukrainerussia
ukrainewar
kyiv
ukrainerussiacrisis
putin
ukraineunderattack
russiaukrainewar
nato
russiaukraine
ukraineinvasion
eu
europe
russianinvasion
us
Hashtags