```
In [1]:  import metapy
```

```
In [2]:  model = metapy.embeddings.load_embeddings('people_emd.toml')
```

Obama

```
In [3]:  embed = model.at("obama")
```

```
In [4]:  embed[0]
```

Out[4]: 2752

```
In [5]:  embed[1]
```

```
Out[5]:  array([ 0.07384618, -0.04542371,  0.01862333,  0.15563688, -0.08496246,
                -0.25363716,  0.01721572,  0.09495658, -0.07802667, -0.09951939,
                 0.01180047,  0.00356013,  0.18589716, -0.23516755,  0.08828916,
                -0.02233863, -0.03766616, -0.18648561, -0.09066692, -0.06773614,
                -0.1219876 ,  0.14072341,  0.09471518, -0.10138252, -0.29632475,
                -0.01343702, -0.31736352,  0.15153969,  0.11783617,  0.03234557,
                -0.00791459,  0.03895727, -0.01765061,  0.14083986,  0.13584782,
                 0.06202644, -0.06186129,  0.17744021, -0.25014936,  0.14411732,
                -0.1034618 , -0.20250769, -0.03254066, -0.05912702, -0.22106882,
                 0.24651014,  0.21890849, -0.16453819,  0.00341864,  0.19902177])
```

```
In [94]:  embed1 = model.at('barack')
```

```
In [95]:  embed1[0]
```

Out[95]: 3937

```
In [96]:  embed1[1]
```

```
Out[96]:  array([ 0.09610838,  0.06105793,  0.01759432,  0.14958497, -0.06510209,
                -0.22001919,  0.00560555,  0.08179043, -0.07337294, -0.09491309,
                -0.04041888,  0.01085689,  0.11996148, -0.20971083,  0.09740521,
                 0.07647822, -0.04457256, -0.13625442, -0.09772792, -0.04708426,
                -0.10866847,  0.17544115,  0.08913331, -0.08327367, -0.2808704 ,
                -0.0417779 , -0.34860966,  0.19839421,  0.10705111,  0.08973701,
                 0.00754587,  0.07409648, -0.0594349 ,  0.10682687,  0.09124355,
                 0.00764122, -0.01308696,  0.10520358, -0.19735811,  0.16611548,
                -0.08097084, -0.2156498 , -0.06083416, -0.07252576, -0.25930893,
                 0.26649169,  0.25459539, -0.17609643,  0.04034812,  0.24477152])
```

In [97]:
```python
combine = embed[1]+embed1[1]
```

In [38]:
```python
combine
```

Out[38]:
```
array([  1.69954558e-01,    1.56342145e-02,    3.62176498e-02,
         3.05221855e-01,   -1.50064545e-01,   -4.73656349e-01,
         2.28212717e-02,    1.76747015e-01,   -1.51399613e-01,
        -1.94432482e-01,   -2.86184059e-02,    1.44170241e-02,
         3.05858641e-01,   -4.44878386e-01,    1.85694362e-01,
         5.41395880e-02,   -8.22387133e-02,   -3.22740030e-01,
        -1.88394841e-01,   -1.14820399e-01,   -2.30656074e-01,
         3.16164562e-01,    1.83848494e-01,   -1.84656193e-01,
        -5.77195149e-01,   -5.52149261e-02,   -6.65973187e-01,
         3.49933897e-01,    2.24887278e-01,    1.22082574e-01,
        -3.68713031e-04,    1.13053748e-01,   -7.70855062e-02,
         2.47666730e-01,    2.27091373e-01,    6.96676653e-02,
        -7.49482449e-02,    2.82643788e-01,   -4.47507473e-01,
         3.10232799e-01,   -1.84432640e-01,   -4.18157490e-01,
        -9.33748219e-02,   -1.31652771e-01,   -4.80377749e-01,
         5.13001830e-01,    4.73503889e-01,   -3.40634617e-01,
         4.37667537e-02,    4.43793287e-01])
```

In [43]:
```python
for i in model.top_k(embed[1]):
    print(model.term(i[0]))
```

```
obama
barack
obamas
clinton
bush
reagan
presidentelect
administrations
presidential
obamain
clintons
bushs
president
governor
w
administration
carter
ronald
confirmed
sworn
```

In [42]:
```python
for i in model.top_k(embed1[1]):
    print(model.term(i[0]))
```

```
barack
obama
obamas
presidentelect
obamain
clinton
reagan
presidential
bush
administrations
ahmadinejad
mahmoud
bushs
inauguration
clintons
president
olusegun
governor
karzai
```

In [98]:
```python
for i in model.top_k(combine):
    print(model.term(i[0]), i[2])
```

```
obama 1.9638202162501468
barack 1.9638202162501461
obamas 1.7588675810682766
presidentelect 1.481288153451042
clinton 1.4710221338882916
bush 1.4282636509735918
obamain 1.4193968442528488
reagan 1.4172522041551576
administrations 1.3792655150426747
presidential 1.3709363810129769
bushs 1.308625491988405
clintons 1.2959203858527713
president 1.2832743217337799
governor 1.2612447313475497
ahmadinejad 1.241894728068454
inauguration 1.221085372621096
w 1.2125753318061991
mahmoud 1.2089088782681792
olusegun 1.2077401983901568
```

Picasso

In [87]:
```python
embed = model.at("picasso")
```

```
In [88]: embed1 = model.at('pablo')
```

```
In [89]: combine = embed[1]+embed1[1]
```

```
In [47]: for i in model.top_k(embed[1]):
             print(model.term(i[0]))
```

```
picasso
pablo
neruda
montoya
plato
casals
marichal
rachmaninov
matisse
eduardo
martnez
toussaint
sarasate
ivan
iglesias
castaneda
juan
gustaf
gmez
gifford
```

```
In [48]: for i in model.top_k(embed1[1]):
             print(model.term(i[0]))
```

```
pablo
picasso
neruda
casals
juan
montoya
martinez
carlos
rodrguez
alberto
marichal
jos
manuel
mario
luis
marina
sergio
sarasate
rafael
marino
```

In [90]:
```python
for i in model.top_k(combine):
    print(model.term(i[0]), i[2])
```

```
picasso 1.8522262687418312
pablo 1.8522262687418307
neruda 1.5090775877499656
casals 1.3931402206244439
montoya 1.3712716796295374
juan 1.3315808320428175
marichal 1.2815227608349633
martinez 1.239599152653107
carlos 1.2318233731485915
eduardo 1.2285148900167449
sarasate 1.2272694245322533
manuel 1.2169609619510955
rachmaninov 1.2145376367841307
martnez 1.2047755833704326
toussaint 1.2033102347814162
iglesias 1.199456123328052
sergio 1.1966610913129778
ivan 1.1867076105142453
mario 1.1858384505748556
enrique 1.1857073134360684
```

Interactive

In [81]:
```python
embed = model.at("sister")
```

In [20]:
```python
embed[1].shape
```

Out[20]: (50,)

In [72]:
```
model.top_k(embed)
```

Out[72]:
```
[(91536,
  array([ 0.07206574,  0.18215168, -0.02209489,  0.16627245,  0.0567010
4,
          0.07613391,  0.08181176,  0.0348838 ,  0.1608617 ,  0.1365442
2,
          0.06935743,  0.0295475 , -0.2690464 ,  0.14441681, -0.0888718
6,
          0.07447143,  0.1507693 ,  0.0277955 ,  0.19777036,  0.1818824
4,
          0.06491678,  0.12215736, -0.18660803,  0.14170171,  0.0545564
9,
          0.27895995, -0.01207386, -0.02167403,  0.18112337, -0.0220364
9,
          0.1652782 , -0.08121686,  0.11358502,  0.25332085,  0.2187674
6,
         -0.02228545,  0.02915313, -0.35928517,  0.15191666,  0.2378472
2,
          0.08005124,  0.02507955, -0.13783199,  0.09011594,  0.1489861
5,
```

In [82]:
```
embed1 = model.at("woman")
```

In [83]:
```
embed2 = model.at("man")
```

In [84]:
```
combine = embed[1]-embed1[1] + embed2[1]
```

In [86]:
```
for i in model.top_k(combine):
    print(model.term(i[0]), i[2])
```

```
brother 0.9840613287940235
sister 0.9665412738237996
sisters 0.9263793216780111
brothers 0.9246731021165289
older 0.8765810702381706
younger 0.850593606011965
friends 0.8433041323847337
son 0.833056883408087
mother 0.8317305831167622
father 0.8309737853315046
elder 0.8182211669852426
daughter 0.7944357804895915
uncle 0.7905408473166351
nick 0.7851807589801044
sons 0.784936559241249
my 0.7823015844927217
guy 0.7752443411225994
twin 0.772591242714215
adam 0.7696610519806564
```

In [18]:
```python
embed = model.at("michelle")
```

In [76]:
```python
embed0 = model.at("obama")
```

In [77]:
```python
embed1 = model.at("woman")
```

In [78]:
```python
embed2 = model.at("man")
```

In [79]:
```python
combine = embed[1] + embed0[1] - embed1[1] + embed2[1]
```

In [80]:
```python
for i in model.top_k(combine):
    print(model.term(i[0]), i[2])
```

```
michelle
obama
barack
charlie
lucas
bush
ted
pat
obamas
nolan
w
luke
sam
clinton
lopez
sanchez
seth
raymond
savage
```

In [70]:
```python
model.at('hha')
```

Out[70]:
```
(91536, array([ 0.07206574,  0.18215168, -0.02209489,  0.16627245,  0.05670104,
        0.07613391,  0.08181176,  0.0348838 ,  0.1608617 ,  0.13654422,
        0.06935743,  0.0295475 , -0.2690464 ,  0.14441681, -0.08887186,
        0.07447143,  0.1507693 ,  0.0277955 ,  0.19777036,  0.18188244,
        0.06491678,  0.12215736, -0.18660803,  0.14170171,  0.05455649,
        0.27895995, -0.01207386, -0.02167403,  0.18112337, -0.02203649,
        0.1652782 , -0.08121686,  0.11358502,  0.25332085,  0.21876746,
       -0.02228545,  0.02915313, -0.35928517,  0.15191666,  0.23784722,
        0.08005124,  0.02507955, -0.13783199,  0.09011594,  0.14898615,
       -0.01512435, -0.04031354,  0.01526428, -0.12107643, -0.18224999]))
```