In [291]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import matplotlib.ticker as tcr
%matplotlib inline
```

In [292]:

```
dating_clean = pd.read_csv('/home/amybirdee/hobby_projects/dating_site/dating_clean.cs
v', delimiter = ',')
```

In [293]:

```
dating_clean.head()
```

Out[293]:

	age	body_type	diet	drinks	drugs	education	ethnicity	height	income
0	22	a little extra	strictly anything	socially	never	working on college/university	asian, white	75	-1
1	35	average	mostly other	often	sometimes	working on space camp	white	70	80000
2	38	thin	anything	socially	no response given	graduated from masters program	no response given	68	-1
3	23	thin	vegetarian	socially	no response given	working on college/university	white	71	20000
4	29	athletic	no response given	socially	never	graduated from college/university	asian, black, other	66	-1

In [294]:

```
#viewing column names
dating_clean.columns
```

Out[294]:

```
Index(['age', 'body_type', 'diet', 'drinks', 'drugs', 'education', 'ethnic
ity',
       'height', 'income', 'job', 'location', 'offspring', 'orientation',
       'pets', 'religion', 'sex', 'sign', 'smokes', 'speaks', 'status'],
      dtype='object')
```

In [295]:

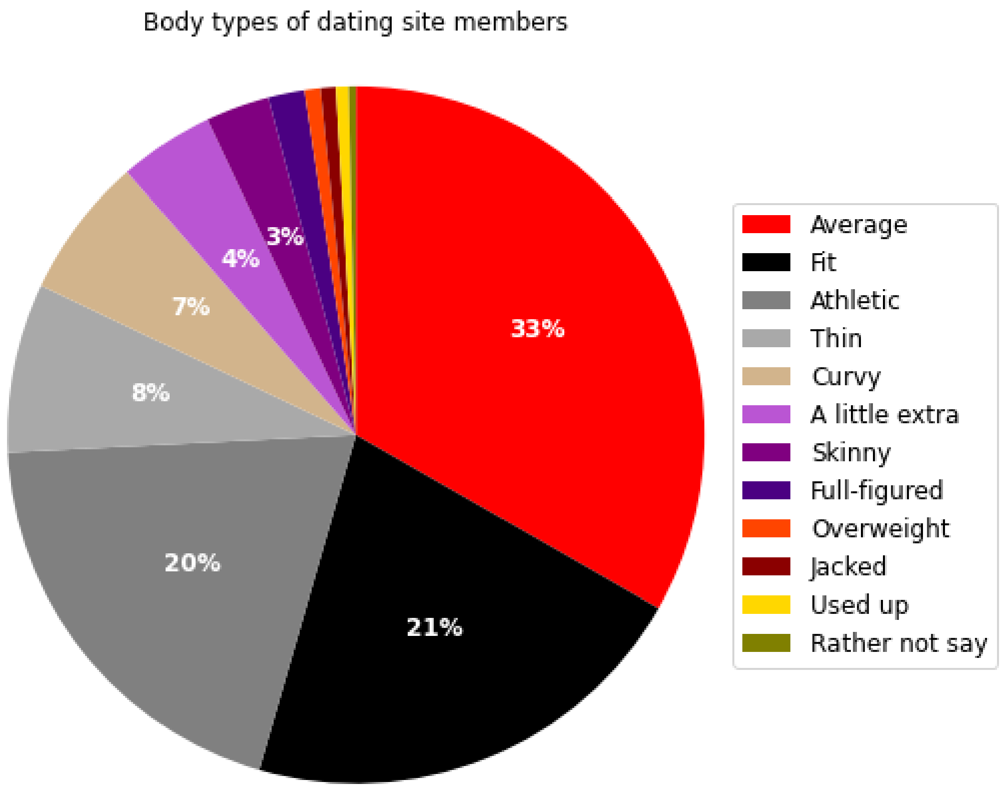
```
#grouping by body type - majority are average body type
body = dating_clean.groupby('body_type').size().sort_values(ascending = False).to_frame
().reset_index().rename(columns = \

{0: 'body_type_count'})
body
```

Out[295]:

	body_type	body_type_count
0	average	19951
1	fit	12711
2	athletic	11819
3	thin	4711
4	curvy	3924
5	a little extra	2629
6	skinny	1777
7	full figured	1009
8	overweight	444
9	jacked	421
10	used up	355
11	rather not say	198

In [296]:

```
#putting data in a pie chart

#don't want all percentages shown on pie as it's too cluttered - this function will avo
id this - will exclude percentages
#below 2%

def my_autopct(pct):
    return ('%.0f%%' % pct) if pct > 2 else ''

body_type = ['Average', 'Fit', 'Athletic', 'Thin', 'Curvy', 'A little extra', 'Skinny',
'Full-figured', 'Overweight',
            'Jacked', 'Used up', 'Rather not say']

colors = ['red', 'black', 'grey','darkgrey', 'tan', 'mediumorchid', 'purple', 'indigo',
'orangered', 'darkred', \
          'gold', 'olive']

plt.pie(body['body_type_count'], colors = colors, radius = 2.0, autopct = my_autopct, \
                          counterclock = False, startangle = -270, \
                        textprops = {'color': 'white', 'weight': 'bold', 'fontsize': 12
})

#bbox_to_anchor moves the legend around depending on the numbers fed in
plt.legend(labels = body_type, bbox_to_anchor = (2, 0.5), loc = 'right', fontsize = 12)

#the y = 1.3 shifts the title up above the chart
plt.title('Body types of dating site members', y = 1.4, fontsize = 12)
#adding bbox_inches = 'tight' as part of the saved chart wascut off without it
plt.savefig('body_types', bbox_inches = 'tight')
```



In [297]:

```
#grouping by diet
diet = dating_clean.groupby('diet').size().sort_values(ascending = False).to_frame().re
set_index().rename(columns = \

{0: 'diet_count'})
diet.head()
```

Out[297]:

	diet	diet_count
0	no response given	24398
1	mostly anything	16585
2	anything	6183
3	strictly anything	5113
4	mostly vegetarian	3444

In [298]:

```
#diet dataframe has lots of similar diets - creating an extra column to group some of t
hese using a dictionary method
diet_dictionary = {'no response given': 'No response',
                  'mostly anything': 'Anything',
                  'anything': 'Anything',
                  'strictly anything': 'Anything',
                  'mostly vegetarian': 'Vegetarian',
                  'mostly other': 'Other',
                  'strictly vegetarian': 'Vegetarian',
                  'vegetarian': 'Vegetarian',
                  'strictly other': 'Other',
                   'mostly vegan': 'Vegan',
                   'other': 'Other',
                  'strictly vegan': 'Vegan',
                  'vegan': 'Vegan',
                  'mostly kosher': 'Kosher',
                  'mostly halal': 'Halal',
                  'strictly kosher': 'Kosher',
                  'strictly halal': 'Halal',
                  'kosher': 'Kosher',
                  'halal': 'Halal'}

diet['diet_group'] = diet['diet'].map(diet_dictionary)
diet.head()
```

Out[298]:

	diet	diet_count	diet_group
0	no response given	24398	No response
1	mostly anything	16585	Anything
2	anything	6183	Anything
3	strictly anything	5113	Anything
4	mostly vegetarian	3444	Vegetarian

In [299]:

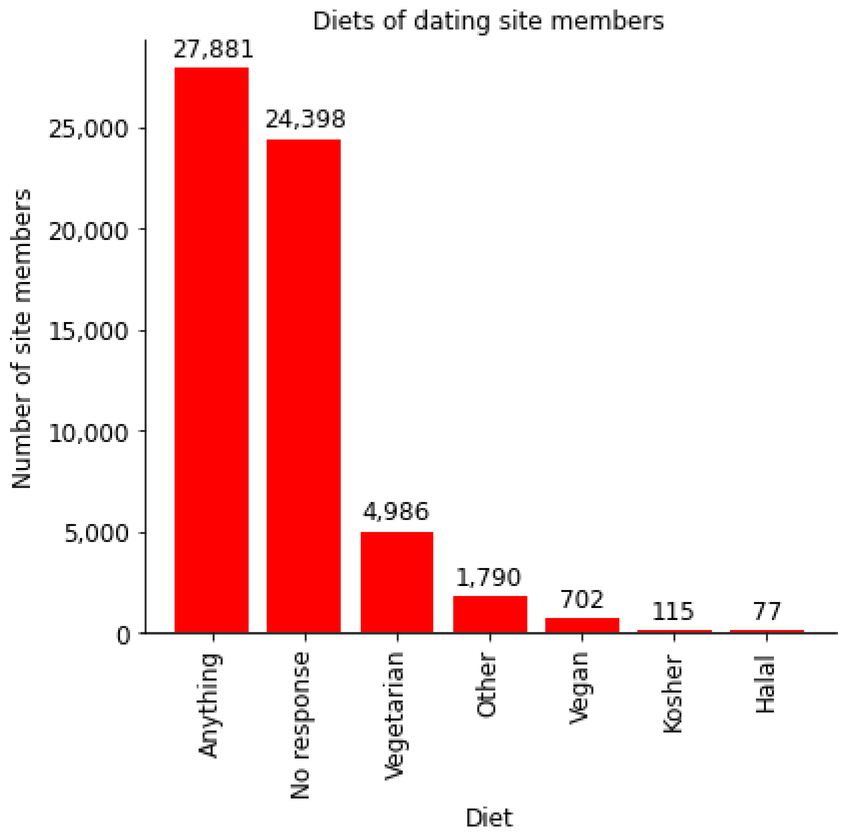
```
#grouping by the new diet column
diet_group = diet.groupby('diet_group').diet_count.sum().sort_values(ascending = False)
.to_frame().reset_index()
diet_group
```

Out[299]:

	diet_group	diet_count
0	Anything	27881
1	No response	24398
2	Vegetarian	4986
3	Other	1790
4	Vegan	702
5	Kosher	115
6	Halal	77

In [300]:

```
#plotting diet on a bar chart
plt.figure(figsize = (6, 6))
ax = plt.subplot()

plt.bar(diet_group['diet_group'], diet_group['diet_count'], color = 'red')

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)

#adding data labels for bars
bars = plt.bar(diet_group['diet_group'], diet_group['diet_count'], color = 'red')

for bar in bars:
    yval = bar.get_height()
    #the '{:,}' command adds a thousand separator to the labels
    ax.annotate('{:,}'.format(yval),
    xy = (bar.get_x() + bar.get_width() / 2, yval),
    #shows label position on x and y axis
    xytext = (0, 3),
    textcoords = 'offset points', ha = 'center', va = 'bottom', fontsize = 12)

#function to add comma separator to labels
def comma(x, pos):
    return format(x, ",.0f")

#this code adds a comma separater to the y tick marks
ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))

plt.xticks(rotation = 90)
plt.xlabel('Diet', fontsize = 12)
plt.ylabel('Number of site members', fontsize = 12)
plt.title('Diets of dating site members', fontsize = 12)
plt.tick_params(axis = 'x', labelsize = 12)
plt.tick_params(axis = 'y', labelsize = 12)

plt.tight_layout()
plt.savefig('Diet')
```



In [301]:

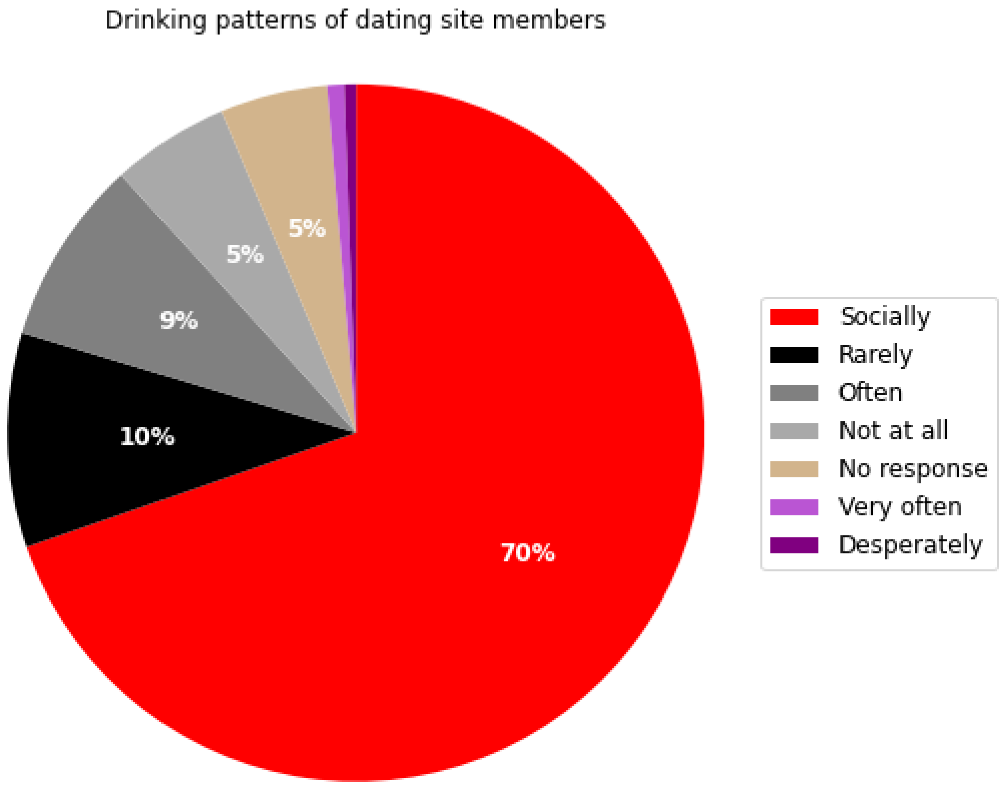
```
#grouping by drinks column
drinks = dating_clean.groupby('drinks').size().sort_values(ascending = False).to_frame
().reset_index().rename(columns = \

{0: 'count_of_drinks'})
drinks
```

Out[301]:

	drinks	count_of_drinks
0	socially	41780
1	rarely	5957
2	often	5164
3	not at all	3267
4	no response given	2988
5	very often	471
6	desperately	322

In [302]:

```
#creating a pie chart - high proportion are social drinkers

def my_autopct(pct):
    return ('%.0f%%' % pct) if pct > 1 else ''

drinks_labels = ['Socially', 'Rarely', 'Often', 'Not at all', 'No response', 'Very ofte
n', 'Desperately']

colors = ['red', 'black', 'grey','darkgrey', 'tan', 'mediumorchid', 'purple']

plt.pie(drinks['count_of_drinks'], colors = colors, radius = 2.0, \
                autopct = my_autopct, counterclock = False, startangle = -270, \
                textprops = {'color': 'white', 'weight': 'bold', 'fontsize': 12})

#bbox_to_anchor moves the legend around depending on the numbers fed in
plt.legend(labels = drinks_labels, bbox_to_anchor = (2, 0.5), loc = 'right', fontsize =
12)


#the y = 1.4 shifts the title up above the chart
plt.title('Drinking patterns of dating site members', y = 1.4, fontsize = 12)
plt.savefig('drinking_patterns', bbox_inches = 'tight')
```



In [303]:

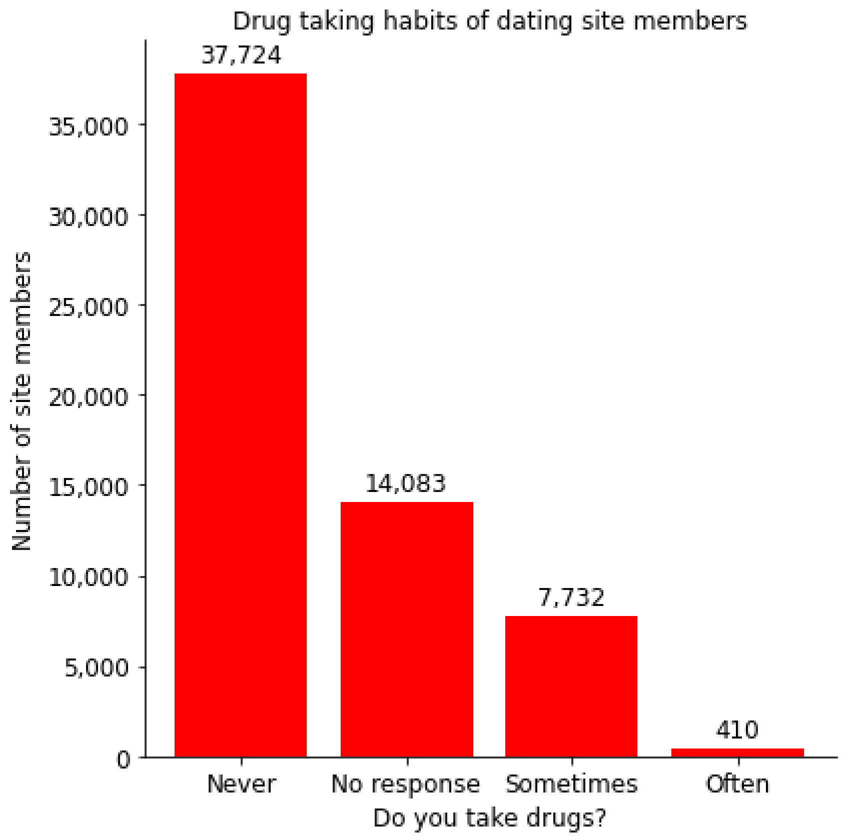
```
#grouping drugs data
drugs = dating_clean.groupby('drugs').size().sort_values(ascending = False).to_frame().
reset_index().rename(columns = \

{0: 'count_of_drugs'})
drugs
```

Out[303]:

	drugs	count_of_drugs
0	never	37724
1	no response given	14083
2	sometimes	7732
3	often	410

In [304]:

```
#plotting on bar chart
labels = ['Never', 'No response', 'Sometimes', 'Often']

plt.figure(figsize = (6, 6))
ax = plt.subplot()

plt.bar(drugs['drugs'], drugs['count_of_drugs'], color = 'red')

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)

#adding data labels for bars
bars = plt.bar(drugs['drugs'], drugs['count_of_drugs'], color = 'red')

for bar in bars:
    yval = bar.get_height()
    #the '{:,}' command adds a thousand separator to the labels
    ax.annotate('{:,}'.format(yval),
    xy = (bar.get_x() + bar.get_width() / 2, yval),
    #shows label position on x and y axis
    xytext = (0, 3),
    textcoords = 'offset points', ha = 'center', va = 'bottom', fontsize = 12)

#this code adds a comma separater to the y tick marks
ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))


plt.xticks(drugs['drugs'], labels, fontsize = 12)
plt.xlabel('Do you take drugs?', fontsize = 12)
plt.ylabel('Number of site members', fontsize = 12)
plt.tick_params(axis = 'x', labelsize = 12)
plt.tick_params(axis = 'y', labelsize = 12)
plt.title('Drug taking habits of dating site members', fontsize = 12)
plt.tight_layout()
plt.savefig('Drugs')
```



In [305]:

```
#grouping by education
education = dating_clean.groupby('education').size().sort_values(ascending = False).to_
frame().reset_index().rename(columns\

= {0: 'education_count'})
education.head()
```

Out[305]:

	education	education_count
0	graduated from college/university	23959
1	graduated from masters program	8961
2	no response given	6631
3	working on college/university	5712
4	working on masters program	1683

In [306]:

```
#education dataframe has lots of similar educations - creating an extra column to group
some of these using a dictionary
#method
education_dictionary = {'graduated from college/university': 'Graduated - higher educat
ion',
                        'graduated from masters program': 'Graduated - higher education'
,
                        'no response given': 'No response',
                        'working on college/university': 'Studying - higher education',
                        'working on masters program': 'Studying - higher education',
                        'graduated from two-year college': 'Graduated - lower education'
,
                        'graduated from high school': 'Graduated - lower education',
                        'graduated from ph.d program': 'Graduated - higher education',
                        'graduated from law school': 'Graduated - higher education',
                        'working on two-year college': 'Studying - lower education',
                        'dropped out of college/university': 'Dropped out',
                        'working on ph.d program': 'Studying - higher education',
                        'college/university': 'Studying - higher education',
                        'graduated from space camp': 'Graduated - higher education',
                        'dropped out of space camp': 'Dropped out',
                        'graduated from med school': 'Graduated - higher education',
                        'working on space camp': 'Studying - higher education',
                        'working on law school': 'Studying - higher education',
                        'two-year college': 'Studying - lower education',
                        'working on med school': 'Studying - higher education',
                        'dropped out of two-year college': 'Dropped out',
                        'dropped out of masters program': 'Dropped out',
                        'masters program': 'Studying - higher education',
                        'dropped out of ph.d program': 'Dropped out',
                        'dropped out of high school': 'Dropped out',
                        'high school': 'Studying - lower education',
                        'working on high school': 'Studying - lower education',
                        'space camp': 'Studying - higher education',
                        'ph.d program': 'Studying - higher education',
                        'law school': 'Studying - higher education',
                        'dropped out of law school': 'Dropped out',
                        'dropped out of med school': 'Dropped out',
                        'med school': 'Studying - higher education'}

education['education_group'] = education['education'].map(education_dictionary)
education.head()
```

Out[306]:

	education	education_count	education_group
0	graduated from college/university	23959	Graduated - higher education
1	graduated from masters program	8961	Graduated - higher education
2	no response given	6631	No response
3	working on college/university	5712	Studying - higher education
4	working on masters program	1683	Studying - higher education

In [307]:

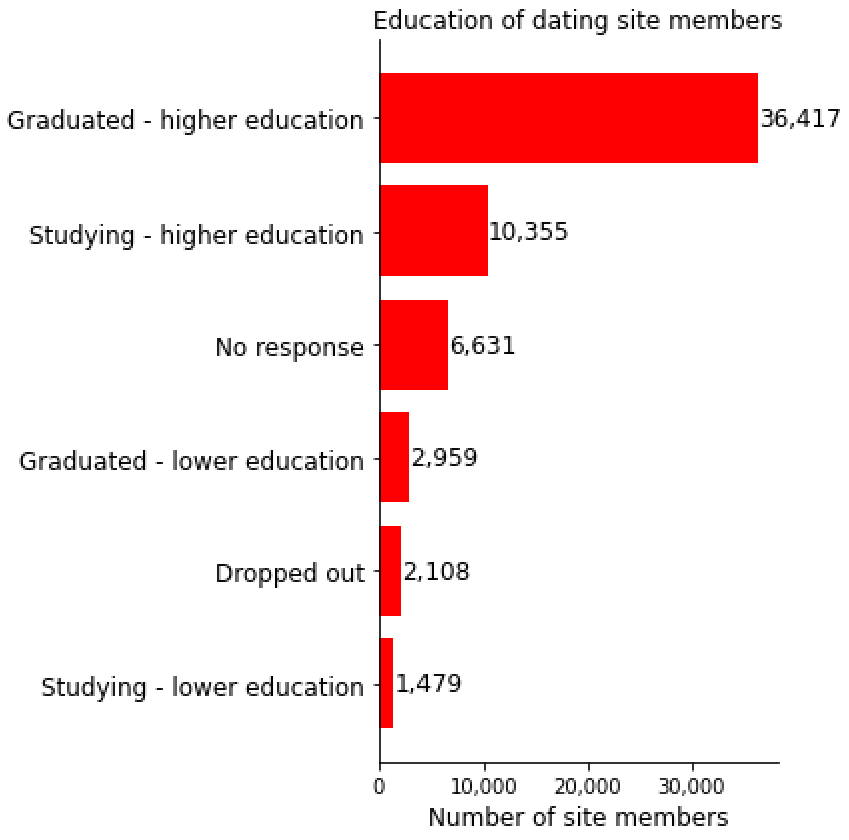
```
#grouping by new column in education table
education_grouped = education.groupby('education_group').education_count.sum().sort_val
ues().to_frame().reset_index()
education_grouped
```

Out[307]:

	education_group	education_count
0	Studying - lower education	1479
1	Dropped out	2108
2	Graduated - lower education	2959
3	No response	6631
4	Studying - higher education	10355
5	Graduated - higher education	36417

In [308]:

```
#plotting on a bar chart - many of the sites's members are highly educated
plt.figure(figsize = (6, 6))
ax = plt.subplot()

plt.barh(education_grouped['education_group'], education_grouped['education_count'], co
lor = 'red')

#removing top and right border
ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)

#adding data labels
bars = plt.barh(education_grouped['education_group'], education_grouped['education_coun
t'], color = 'red')

for bar in bars:
    x_val = bar.get_width()
    y_val = bar.get_y() + bar.get_height() / 2
    label = '{:,}'.format(x_val)
    plt.annotate(label, (x_val, y_val), ha = 'left', va = 'center', fontsize = 12)


#function to add comma separator to labels
def comma(y, pos):
    return format(y, ",.0f")

#this code adds a comma separater to the y tick marks
ax.xaxis.set_major_formatter(tcr.FuncFormatter(comma))

plt.xlabel('Number of site members', fontsize = 12)
plt.ylabel('')
plt.tick_params(axis = 'y', labelsize = 12)
plt.title('Education of dating site members', fontsize = 12)
plt.tight_layout()
plt.savefig('Education')
```


Education of dating site members
Graduated - higher education
36,417
Studying - higher education
10,355
No response
6,631
Graduated - lower education
2,959
Dropped out
2,108
Studying - lower education
1,479
0
10,000
20,000
30,000
Number of site members

In [309]:

```
#is there a link between those who dropped out of education and their drink/drugs takin
g? Filtering the main dataframe to
#find out
dropped_out = dating_clean[dating_clean['education'].str.contains('dropped')]
dropped_out.head()
```

Out[309]:

	age	body_type	diet	drinks	drugs	education	ethnicity	height	incon
48	31	thin	strictly anything	socially	sometimes	dropped out of space camp	no response given	67	10000(
96	34	skinny	mostly other	very often	no response given	dropped out of space camp	white	75	
117	55	athletic	no response given	not at all	never	dropped out of college/university	white	67	
128	26	average	no response given	often	never	dropped out of space camp	white	71	
130	30	average	no response given	socially	sometimes	dropped out of college/university	white	69	

In [310]:

```
#grouping by the dropped out column
dropped = dropped_out.groupby('education').size().sort_values(ascending = False).to_fra
me().reset_index().rename(columns \

= {0: 'dropped_count'})
dropped
```

Out[310]:

	education	dropped_count
0	dropped out of college/university	995
1	dropped out of space camp	523
2	dropped out of two-year college	191
3	dropped out of masters program	140
4	dropped out of ph.d program	127
5	dropped out of high school	102
6	dropped out of law school	18
7	dropped out of med school	12

In [311]:

```
#splitting these between dropping out of higher and lower eduction by applying a functi
on

def set_value(row_number, assigned_value):
    return(assigned_value[row_number])

dropped_out_dict = {'dropped out of college/university': 'dropped out - higher educatio
n',
                   'dropped out of space camp': 'dropped out - higher education',
                   'dropped out of two-year college': 'dropped out - lower education',
                   'dropped out of masters program': 'dropped out - higher education',
                   'dropped out of ph.d program': 'dropped out - higher education',
                   'dropped out of high school': 'dropped out - lower education',
                   'dropped out of law school': 'dropped out - higher education',
                   'dropped out of med school': 'dropped out - higher education'}

#there is a comma after dropped_out_dict below - without this there was an error saying
the function expected 2 arguments
#but 9 were given
dropped_out['dropped_group'] = dropped_out['education'].apply(set_value, args = (droppe
d_out_dict, ))
dropped_out.head()
```

```
/usr/local/lib/python3.6/dist-packages/ipykernel_launcher.py:17: SettingWi
thCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-doc
s/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
```

Out[311]:

	age	body_type	diet	drinks	drugs	education	ethnicity	height	incon
48	31	thin	strictly anything	socially	sometimes	dropped out of space camp	no response given	67	10000(
96	34	skinny	mostly other	very often	no response given	dropped out of space camp	white	75	
117	55	athletic	no response given	not at all	never	dropped out of college/university	white	67	
128	26	average	no response given	often	never	dropped out of space camp	white	71	
130	30	average	no response given	socially	sometimes	dropped out of college/university	white	69	

5 rows × 21 columns

In [312]:

```
#dropping unnecessary columns
dropped_out = dropped_out.drop(['age', 'body_type', 'diet', 'ethnicity', 'height', 'inc
ome', 'job', 'location',\
                              'offspring', 'orientation', 'pets', 'religion', 'sex', 's
ign', 'smokes', 'speaks', 'status'], \
                               axis = 1).reset_index(drop = True)
dropped_out.head()
```

Out[312]:

	drinks	drugs	education	dropped_group
0	socially	sometimes	dropped out of space camp	dropped out - higher education
1	very often	no response given	dropped out of space camp	dropped out - higher education
2	not at all	never	dropped out of college/university	dropped out - higher education
3	often	never	dropped out of space camp	dropped out - higher education
4	socially	sometimes	dropped out of college/university	dropped out - higher education

In [313]:

```
#grouping by education and drinking - higher education people who dropped out drink mor
e
dropped_drink = dropped_out.groupby(['dropped_group', 'drinks']).dropped_group.count()
dropped_drink
```

Out[313]:

```
dropped_group                  drinks
dropped out - higher education desperately            41
                               no response given      50
                               not at all            147
                               often                 264
                               rarely                246
                               socially             1027
                               very often             40
dropped out - lower education  desperately             7
                               no response given       5
                               not at all             35
                               often                  44
                               rarely                 41
                               socially              143
                               very often             18
Name: dropped_group, dtype: int64
```

In [314]:

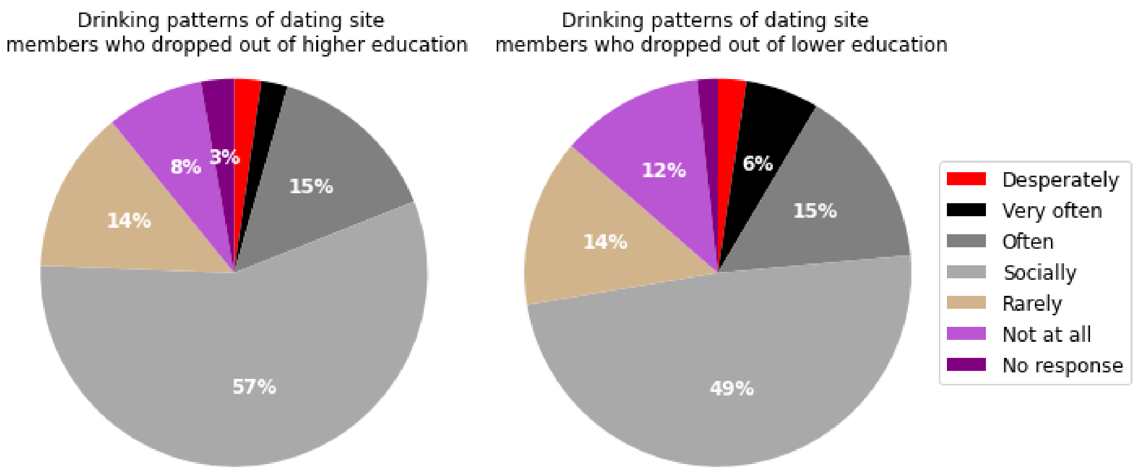
```
#grouping by education and drugs - higher education people who dropped out do more drug
s
dropped_drugs = dropped_out.groupby(['dropped_group', 'drugs']).dropped_group.count()
dropped_drugs
```

Out[314]:

```
dropped_group                   drugs
dropped out - higher education  never                817
                                no response given    454
                                often                 43
                                sometimes            501
dropped out - lower education   never                139
                                no response given     48
                                often                 19
                                sometimes             87
Name: dropped_group, dtype: int64
```

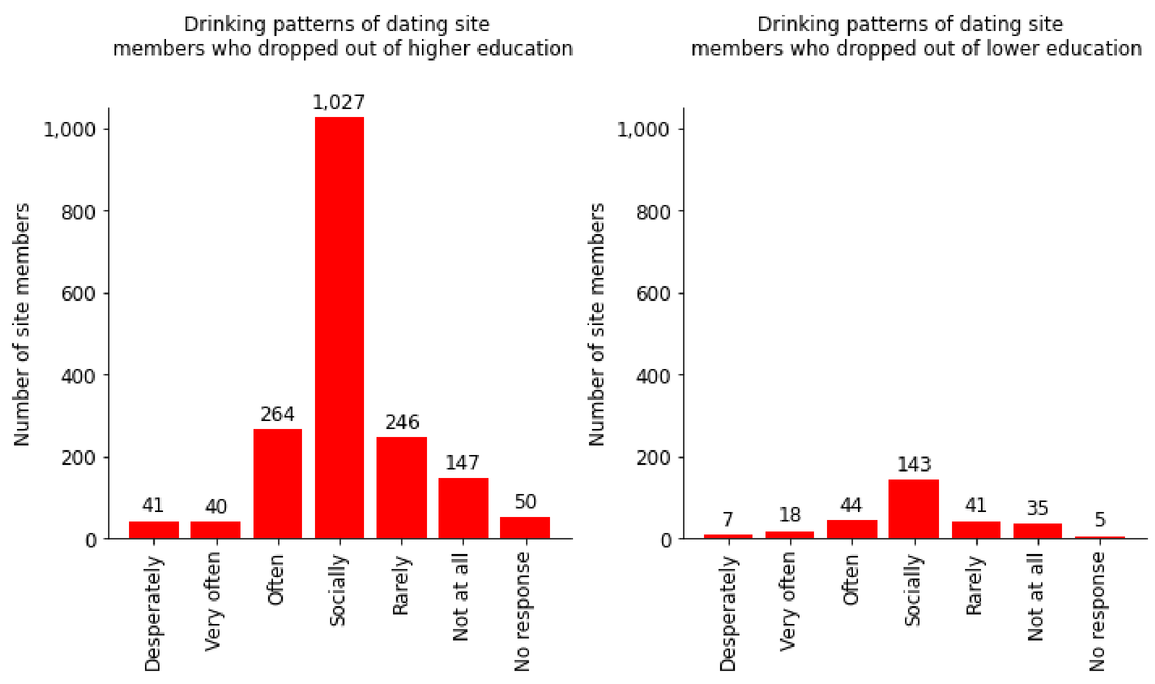
In [315]:

```
#creating pie charts to show the comparison
drink_labels = ['Desperately', 'Very often', 'Often', 'Socially', 'Rarely', 'Not at al
l', 'No response']

drinks_higher = [41, 40, 264, 1027, 246, 147, 50]
drinks_lower = [7, 18, 44, 143, 41, 35, 5]
colors = ['red', 'black', 'grey','darkgrey', 'tan', 'mediumorchid', 'purple']

def drinks_autopct(pct):
    return ('%.0f%%' % pct) if pct > 2.5 else ''

ax = plt.subplot(1, 2, 1)
plt.pie(drinks_higher, colors = colors, radius = 8.0, autopct = drinks_autopct, \
            counterclock = False, startangle = -270, \
           textprops = {'color': 'white', 'weight': 'bold', 'fontsize': 12})

plt.title('Drinking patterns of dating site \n members who dropped out of higher educat
ion', y = 4.0)

ax = plt.subplot(1, 2, 2)
plt.pie(drinks_lower, colors = colors, radius = 8.0, autopct = drinks_autopct, \
                          counterclock = False, startangle = -270, \
                         textprops = {'color': 'white', 'weight': 'bold', 'fontsize': 1
2})

#adjusting space between pie charts
plt.subplots_adjust(wspace = 7.0)

#bbox_to_anchor moves the legend around depending on the numbers fed in
plt.legend(labels = drink_labels, bbox_to_anchor = (7.5, 0.5), loc = 'right', fontsize
= 12)

plt.title('Drinking patterns of dating site \n members who dropped out of lower educati
on', y = 4.0, fontsize = 12)
plt.savefig('drinking_patterns_by education')
```



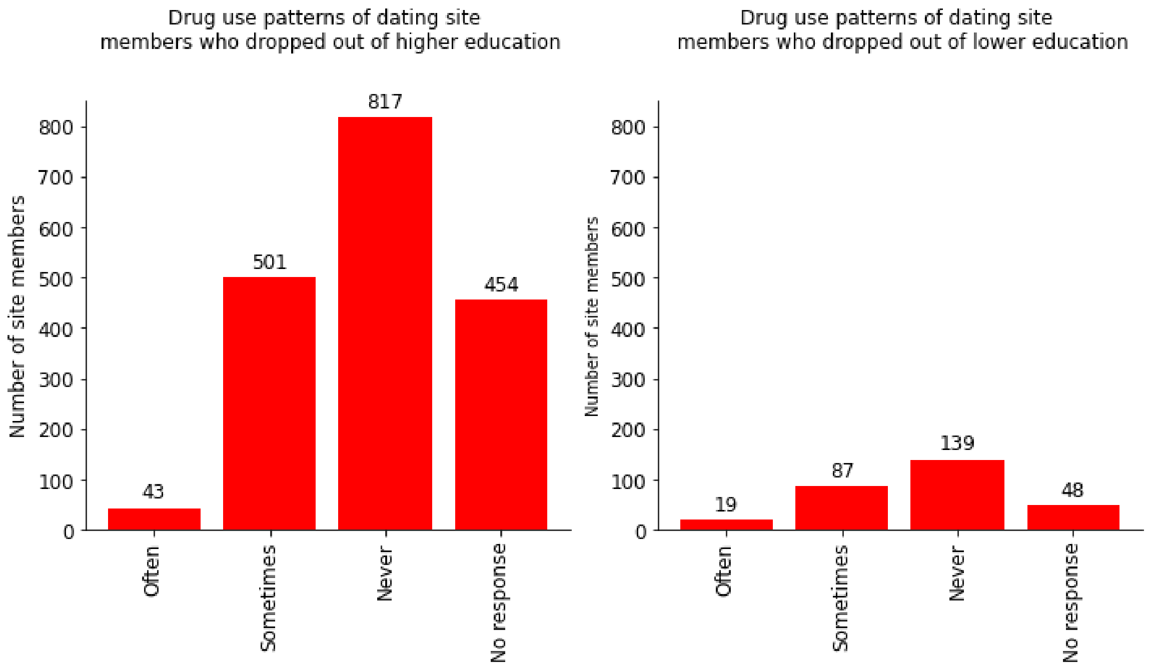
In [316]:

```
#pie chart hides the true numbers - trying a bar chart
drink_labels = ['Desperately', 'Very often', 'Often', 'Socially', 'Rarely', 'Not at al
l', 'No response']

drinks_higher = [41, 40, 264, 1027, 246, 147, 50]
drinks_lower = [7, 18, 44, 143, 41, 35, 5]

fig = plt.figure(figsize = (10, 6))
ax = fig.add_subplot(1, 2, 1)
plt.bar(drink_labels, drinks_higher, color = 'red')

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)

bars = plt.bar(drink_labels, drinks_higher, color = 'red')

for bar in bars:
    yval = bar.get_height()
    #the '{:,}' command adds a thousand separator to the labels
    ax.annotate('{:,}'.format(yval),
    xy = (bar.get_x() + bar.get_width() / 2, yval),
    #shows label position on x and y axis
    xytext = (0, 3),
    textcoords = 'offset points', ha = 'center', va = 'bottom', fontsize = 12)

#function to add comma separator to labels
def comma(x, pos):
    return format(x, ",.0f")

#this code adds a comma separater to the y tick marks
ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))


plt.xticks(drink_labels, rotation = 90, fontsize = 12)
plt.ylim(0, 1050)
plt.xlabel('')
plt.ylabel('Number of site members', fontsize = 12)
plt.tick_params(axis = 'y', labelsize = 12)
plt.tick_params(axis = 'y', labelsize = 12)
plt.title('Drinking patterns of dating site \n members who dropped out of higher educat
ion', fontsize = 12, y = 1.1)

ax = fig.add_subplot(1, 2, 2)
plt.bar(drink_labels, drinks_lower, color = 'red')

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)

bars = plt.bar(drink_labels, drinks_lower, color = 'red')

for bar in bars:
    yval = bar.get_height()
    #the '{:,}' command adds a thousand separator to the labels
    ax.annotate('{:,}'.format(yval),
    xy = (bar.get_x() + bar.get_width() / 2, yval),
    #shows label position on x and y axis
    xytext = (0, 3),
    textcoords = 'offset points', ha = 'center', va = 'bottom', fontsize = 12)

ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))

plt.xticks(drink_labels, rotation = 90, fontsize = 12)
plt.ylim(0, 1050)
plt.xlabel('')
plt.ylabel('Number of site members', fontsize = 12)
plt.tick_params(axis = 'y', labelsize = 12)
plt.title('Drinking patterns of dating site \n members who dropped out of lower educati
on', fontsize = 12, y = 1.1)

plt.subplots_adjust(wspace = 0.4)
plt.tight_layout()
plt.savefig('drinking_patterns_by_education_bar_chart')
```



In [317]:

```
#creating bar charts for drug use
drug_labels = ['Often', 'Sometimes', 'Never', 'No response']

drugs_higher = [43, 501, 817, 454]
drugs_lower = [19, 87, 139, 48]

fig = plt.figure(figsize = (10, 6))
ax = fig.add_subplot(1, 2, 1)
plt.bar(drug_labels, drugs_higher, color = 'red')

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)

bars = plt.bar(drug_labels, drugs_higher, color = 'red')

for bar in bars:
    yval = bar.get_height()
    #the '{:,}' command adds a thousand separator to the labels
    ax.annotate('{:,}'.format(yval),
    xy = (bar.get_x() + bar.get_width() / 2, yval),
    #shows label position on x and y axis
    xytext = (0, 3),
    textcoords = 'offset points', ha = 'center', va = 'bottom', fontsize = 12)

ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))

plt.xticks(drug_labels, rotation = 90, fontsize = 12)
plt.xlabel('')
plt.tick_params(axis = 'y', labelsize = 12)
plt.ylim(0, 850)
plt.ylabel('Number of site members', fontsize = 12)
plt.title('Drug use patterns of dating site \n members who dropped out of higher educat
ion', fontsize = 12, y = 1.1)

ax = fig.add_subplot(1, 2, 2)
plt.bar(drug_labels, drugs_lower, color = 'red')

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)

bars = plt.bar(drug_labels, drugs_lower, color = 'red')

for bar in bars:
    yval = bar.get_height()
    #the '{:,}' command adds a thousand separator to the labels
    ax.annotate('{:,}'.format(yval),
    xy = (bar.get_x() + bar.get_width() / 2, yval),
    #shows label position on x and y axis
    xytext = (0, 3),
    textcoords = 'offset points', ha = 'center', va = 'bottom', fontsize = 12)

ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))

plt.xticks(drug_labels, rotation = 90, fontsize = 12)
plt.xlabel('')
plt.tick_params(axis = 'y', labelsize = 12)
plt.ylim(0, 850)
plt.ylabel('Number of site members')
plt.title('Drug use patterns of dating site \n members who dropped out of lower educati
on', fontsize = 12, y = 1.1)

plt.subplots_adjust(wspace = 0.4)
plt.tight_layout()
plt.savefig('drug_use_patterns_by_education')
```



In [318]:

```
#grouping by the ethnicity column - there are 217 entries. Not going to make assumption
s about ethnicity by grouping them
#and this many entries isn't really feasible for a chart
ethnicity = dating_clean.groupby('ethnicity').size().sort_values(ascending = False).to_
frame().reset_index().rename(columns \

= {0: 'ethnicity_count'})
ethnicity.head()
```

Out[318]:

	ethnicity	ethnicity_count
0	white	32828
1	asian	6134
2	no response given	5686
3	hispanic / latin	2823
4	black	2008

In [319]:

```
#grouping by job column
job = dating_clean.groupby('job').size().sort_values(ascending = False).to_frame().rese
t_index().rename(columns = \

{0: 'job_count'})
job.head()
```

Out[319]:

	job	job_count
0	no response given	8204
1	other	7588
2	student	4882
3	science / tech / engineering	4848
4	computer / hardware / software	4709

In [320]:

```
#the 'no response', 'rather not say' and 'other' categories in the job table don't tell
us anything so dropping those
job = job.drop([0, 1, 17]).reset_index(drop = True)
job
```

Out[320]:

	job	job_count
0	student	4882
1	science / tech / engineering	4848
2	computer / hardware / software	4709
3	artistic / musical / writer	4438
4	sales / marketing / biz dev	4391
5	medicine / health	3679
6	education / academia	3513
7	executive / management	2373
8	banking / financial / real estate	2266
9	entertainment / media	2250
10	law / legal services	1381
11	hospitality / travel	1364
12	construction / craftsmanship	1021
13	clerical / administrative	805
14	political / government	708
15	transportation	366
16	unemployed	273
17	retired	250
18	military	204

In [321]:

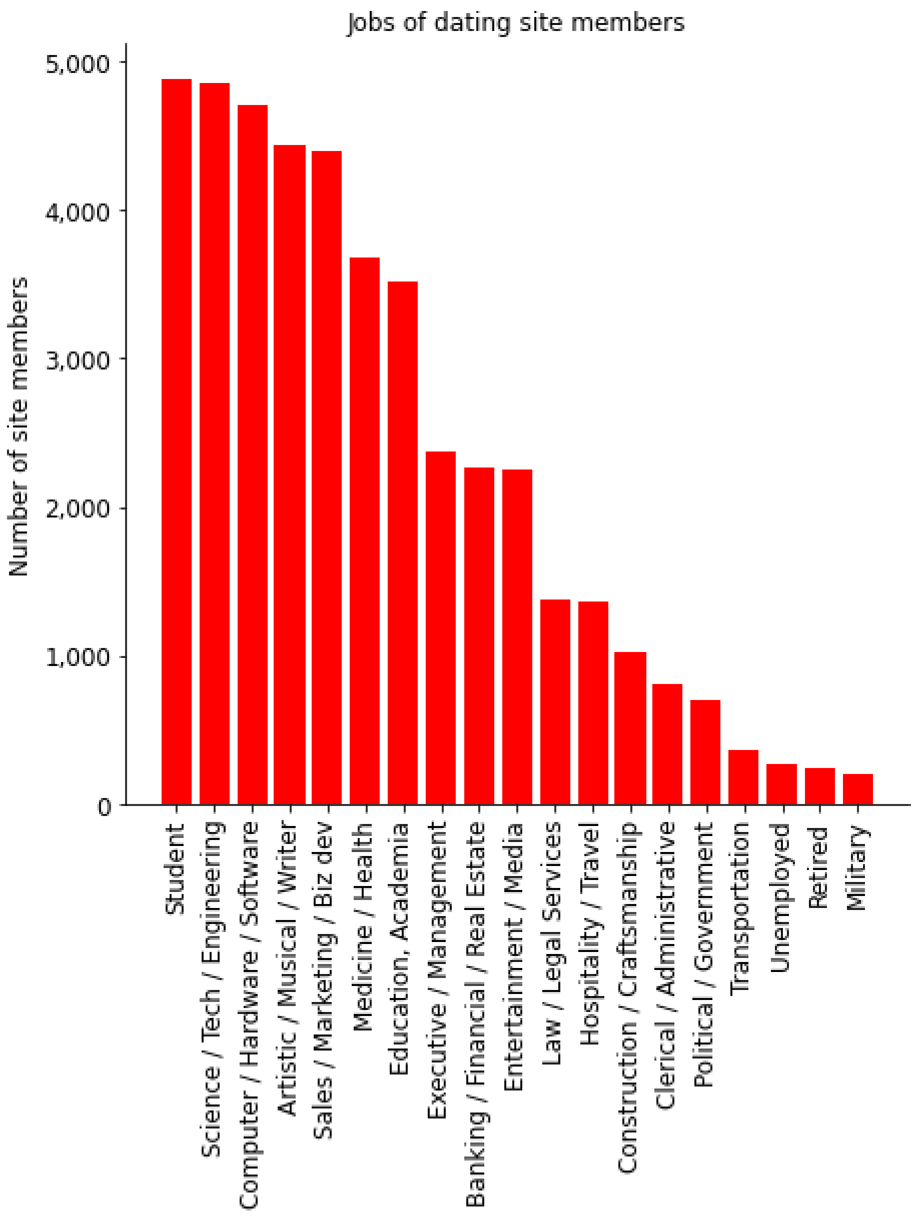
```
#changing job titles to capital letters for chart
job_dictionary = {'student': 'Student',
                  'science / tech / engineering': 'Science / Tech / Engineering',
                  'computer / hardware / software': 'Computer / Hardware / Software',
                  'artistic / musical / writer': 'Artistic / Musical / Writer',
                  'sales / marketing / biz dev': 'Sales / Marketing / Biz dev',
                  'medicine / health': 'Medicine / Health',
                  'education / academia': 'Education, Academia',
                  'executive / management': 'Executive / Management',
                  'banking / financial / real estate': 'Banking / Financial / Real Esta
te',
                  'entertainment / media': 'Entertainment / Media',
                  'law / legal services': 'Law / Legal Services',
                  'hospitality / travel': 'Hospitality / Travel',
                  'construction / craftsmanship': 'Construction / Craftsmanship',
                  'clerical / administrative': 'Clerical / Administrative',
                  'political / government': 'Political / Government',
                  'transportation': 'Transportation',
                  'unemployed': 'Unemployed',
                  'retired': 'Retired',
                  'military': 'Military'}

job['job'] = job['job'].map(job_dictionary)
job.head()
```

Out[321]:

	job	job_count
0	Student	4882
1	Science / Tech / Engineering	4848
2	Computer / Hardware / Software	4709
3	Artistic / Musical / Writer	4438
4	Sales / Marketing / Biz dev	4391

In [322]:

```
#plotting jobs on a bar chart
plt.figure(figsize = (7,7))
ax = plt.subplot()
plt.bar(job['job'], job['job_count'], color = 'red')

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)

#this code adds a comma separater to the y tick marks
ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))

plt.xticks(rotation = 90)
plt.xlabel('')
plt.ylabel('Number of site members', fontsize = 12)
plt.tick_params(axis = 'x', labelsize = 12)
plt.tick_params(axis = 'y', labelsize = 12)
plt.title('Jobs of dating site members', fontsize = 12)
plt.savefig('Jobs', bbox_inches = 'tight')
```



In [323]:

```
#grouping by location column
location = dating_clean.groupby('location').size().sort_values(ascending = False).to_fr
ame().reset_index().rename(columns = \

{0: 'location_count'})
location.head()
```

Out[323]:

	location	location_count
0	san francisco, california	31064
1	oakland, california	7214
2	berkeley, california	4210
3	san mateo, california	1331
4	palo alto, california	1064

In [324]:

```
#using lambda x to replace some of these values
location['location'] = location.location.apply(lambda x: 'California' if 'california' in x else x)
location['location'] = location.location.apply(lambda x: 'Florida' if 'florida' in x else x)
location['location'] = location.location.apply(lambda x: 'New York' if 'new york' in x else x)
location['location'] = location.location.apply(lambda x: 'Massachusetts' if 'massachusetts' in x else x)
location['location'] = location.location.apply(lambda x: 'Illinois' if 'illinois' in x else x)
location['location'] = location.location.apply(lambda x: 'Georgia' if 'georgia' in x else x)
location['location'] = location.location.apply(lambda x: 'Mississippi' if 'mississippi' in x else x)
location['location'] = location.location.apply(lambda x: 'Oregon' if 'oregon' in x else x)
location['location'] = location.location.apply(lambda x: 'Michigan' if 'michigan' in x else x)
location['location'] = location.location.apply(lambda x: 'Texas' if 'texas' in x else x)
location['location'] = location.location.apply(lambda x: 'Idaho' if 'idaho' in x else x)
location['location'] = location.location.apply(lambda x: 'Minnesota' if 'minnesota' in x else x)
location['location'] = location.location.apply(lambda x: 'Washington' if 'washington' in x else x)
location['location'] = location.location.apply(lambda x: 'Virginia' if 'virginia' in x else x)
location['location'] = location.location.apply(lambda x: 'Utah' if 'utah' in x else x)
location['location'] = location.location.apply(lambda x: 'Arizona' if 'arizona' in x else x)
location['location'] = location.location.apply(lambda x: 'Tennessee' if 'tennessee' in x else x)
location['location'] = location.location.apply(lambda x: 'Montana' if 'montana' in x else x)
location['location'] = location.location.apply(lambda x: 'Ohio' if 'ohio' in x else x)
location['location'] = location.location.apply(lambda x: 'North Carolina' if 'north carolina' in x else x)
location['location'] = location.location.apply(lambda x: 'Connecticut' if 'connecticut' in x else x)
location['location'] = location.location.apply(lambda x: 'Canada' if 'canada' in x else x)
location['location'] = location.location.apply(lambda x: 'Wisconsin' if 'wisconsin' in x else x)
location['location'] = location.location.apply(lambda x: 'Spain' if 'spain' in x else x)
location['location'] = location.location.apply(lambda x: 'United Kingdom' if 'united kingdom' in x else x)
location['location'] = location.location.apply(lambda x: 'United Kingdom' if 'ireland' in x else x)
location['location'] = location.location.apply(lambda x: 'Switzerland' if 'switzerland' in x else x)
location['location'] = location.location.apply(lambda x: 'Louisiana' if 'louisiana' in x else x)
location['location'] = location.location.apply(lambda x: 'Hawaii' if 'hawaii' in x else x)
location['location'] = location.location.apply(lambda x: 'Nevada' if 'nevada' in x else x)
```

```
location['location'] = location.location.apply(lambda x: 'Mexico' if 'mexico' in x else
x)
location['location'] = location.location.apply(lambda x: 'Colorado' if 'colorado' in x
else x)
location['location'] = location.location.apply(lambda x: 'Netherlands' if 'netherlands'
in x else x)
location['location'] = location.location.apply(lambda x: 'New Jersey' if 'new jersey' i
n x else x)
location['location'] = location.location.apply(lambda x: 'Rhode Island' if 'rhode islan
d' in x else x)
location['location'] = location.location.apply(lambda x: 'Pennsylvania' if 'pennsylvani
a' in x else x)
location['location'] = location.location.apply(lambda x: 'Vietnam' if 'vietnam' in x el
se x)
location['location'] = location.location.apply(lambda x: 'Germany' if 'germany' in x el
se x)
location['location'] = location.location.apply(lambda x: 'Missouri' if 'missouri' in x
else x)
```

In [325]:

```
#grouping the new table
location_grouped = location.groupby('location').location_count.sum().sort_values(ascend
ing = False).to_frame().reset_index()
location_grouped.head(10)
```

Out[325]:

	location	location_count
0	California	59852
1	New York	17
2	Illinois	8
3	no response given	6
4	Massachusetts	5
5	Oregon	4
6	Washington	4
7	Texas	4
8	Michigan	4
9	Florida	3

In [326]:

```
#will display as a tabel in presentation so sending to csv
location = location.to_csv('/home/amybirdee/hobby_projects/dating_site/location_data.cs
v', index = False)
```

In [327]:

```
#grouping by offspring
offspring = dating_clean.groupby('offspring').size().sort_values(ascending = False).to_
frame().reset_index().rename(columns = \

{0: 'offspring_count'})
offspring
```

Out[327]:

	offspring	offspring_count
0	no response given	35566
1	doesn't have kids	7559
2	doesn't have kids, but might want them	3875
3	doesn't have kids, but wants them	3565
4	doesn't want kids	2926
5	has kids	1883
6	has a kid	1881
7	doesn't have kids, and doesn't want any	1132
8	has kids, but doesn't want more	442
9	has a kid, but doesn't want more	275
10	has a kid, and might want more	231
11	wants kids	225
12	might want kids	182
13	has kids, and might want more	115
14	has a kid, and wants more	71
15	has kids, and wants more	21

In [328]:

```
#grouping and renaming some of the offspring data
def set_value(row_number, assigned_value):
    return(assigned_value[row_number])

offspring_dict = {'no response given': 'No response',
                 'doesn\'t have kids': 'Doesn\'t have kids',
                 'doesn\'t have kids, but might want them': 'Doesn\'t have kids but mig
ht want them',
                 'doesn\'t have kids, but wants them': 'Doesn\'t have kids but wants th
em',
                 'doesn\'t want kids': 'Doesn\'t want kids',
                 'has kids': 'Has kids',
                 'has a kid': 'Has kids',
                 'doesn\'t have kids, and doesn\'t want any': 'Doesn\'t have kids and d
oesn\'t want any',
                 'has kids, but doesn\'t want more': 'Has kids but doesn\'t want more',
                 'has a kid, but doesn\'t want more': 'Has kids but doesn\'t want more'
,
                 'has a kid, and might want more': 'Has kids and might want more',
                 'has kids, and might want more': 'Has kids and might want more',
                 'wants kids': 'Wants kids',
                 'might want kids': 'Might want kids',
                 'has a kid, and wants more': 'Has kids and wants more',
                 'has kids, and wants more': 'Has kids and wants more'}



#there is a comma after dropped_out_dict below - without this there was an error saying
the function expected 2 arguments
#but 9 were given
offspring['offspring_group'] = offspring['offspring'].apply(set_value, args = (offsprin
g_dict, ))
offspring
```

Out[328]:

	offspring	offspring_count	offspring_group
0	no response given	35566	No response
1	doesn't have kids	7559	Doesn't have kids
2	doesn't have kids, but might want them	3875	Doesn't have kids but might want them
3	doesn't have kids, but wants them	3565	Doesn't have kids but wants them
4	doesn't want kids	2926	Doesn't want kids
5	has kids	1883	Has kids
6	has a kid	1881	Has kids
7	doesn't have kids, and doesn't want any	1132	Doesn't have kids and doesn't want any
8	has kids, but doesn't want more	442	Has kids but doesn't want more
9	has a kid, but doesn't want more	275	Has kids but doesn't want more
10	has a kid, and might want more	231	Has kids and might want more
11	wants kids	225	Wants kids
12	might want kids	182	Might want kids
13	has kids, and might want more	115	Has kids and might want more
14	has a kid, and wants more	71	Has kids and wants more
15	has kids, and wants more	21	Has kids and wants more

In [329]:

```
offspring_grouped = offspring.groupby('offspring_group').sum().sort_values(by = 'offspr
ing_count', \
                                                                           ascending =
False).reset_index()
offspring_grouped
```

Out[329]:

	offspring_group	offspring_count
0	No response	35566
1	Doesn't have kids	7559
2	Doesn't have kids but might want them	3875
3	Has kids	3764
4	Doesn't have kids but wants them	3565
5	Doesn't want kids	2926
6	Doesn't have kids and doesn't want any	1132
7	Has kids but doesn't want more	717
8	Has kids and might want more	346
9	Wants kids	225
10	Might want kids	182
11	Has kids and wants more	92

In [330]:

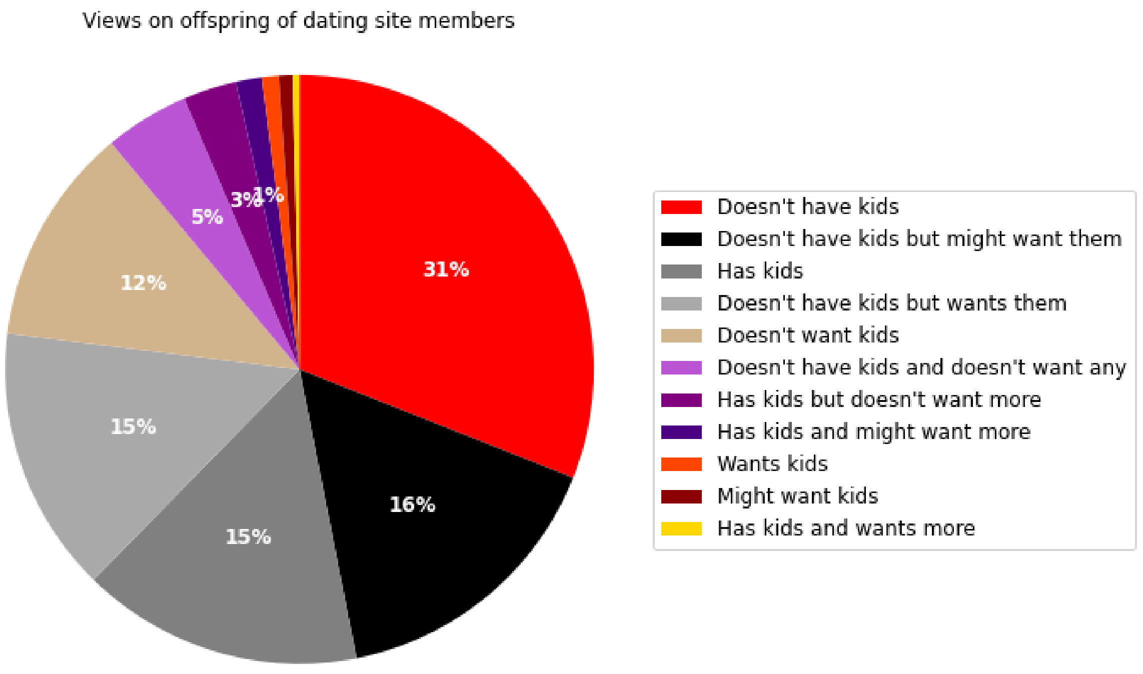
```
#dropping the no response rwo for chart
offspring_grouped = offspring_grouped.drop([0]).reset_index(drop = True)
offspring_grouped
```

Out[330]:

	offspring_group	offspring_count
0	Doesn't have kids	7559
1	Doesn't have kids but might want them	3875
2	Has kids	3764
3	Doesn't have kids but wants them	3565
4	Doesn't want kids	2926
5	Doesn't have kids and doesn't want any	1132
6	Has kids but doesn't want more	717
7	Has kids and might want more	346
8	Wants kids	225
9	Might want kids	182
10	Has kids and wants more	92

In [331]:

```
#creating a pie chart - high proportion don't have kids - makes sense as most members a
re in younger age groups

def my_autopct(pct):
    return ('%.0f%%' % pct) if pct > 1 else ''

colors = ['red', 'black', 'grey','darkgrey', 'tan', 'mediumorchid', 'purple', 'indigo',
'orangered', 'darkred', 'gold']

plt.pie(offspring_grouped['offspring_count'], colors = colors, radius = 2.0, autopct =
my_autopct, \
                          counterclock = False, startangle = -270, \
                         textprops = {'color': 'white', 'weight': 'bold', 'fontsize': 1
2})

#bbox_to_anchor moves the legend around depending on the numbers fed in
plt.legend(labels = offspring_grouped['offspring_group'], bbox_to_anchor = (2.8, 0.5),
loc = 'right', fontsize = 12)

#the y = 1.3 shifts the title up above the chart
plt.title('Views on offspring of dating site members', y = 1.4, fontsize = 12)
plt.savefig('Offspring')
```



In [332]:

```
#grouping by orientation
orientation = dating_clean.groupby('orientation').size().sort_values(ascending = False)
.to_frame().reset_index().rename(\

columns = {0: 'orientation_count'})
orientation
```

Out[332]:

	orientation	orientation_count
0	straight	51603
1	gay	5573
2	bisexual	2767
3	no response given	6

In [333]:

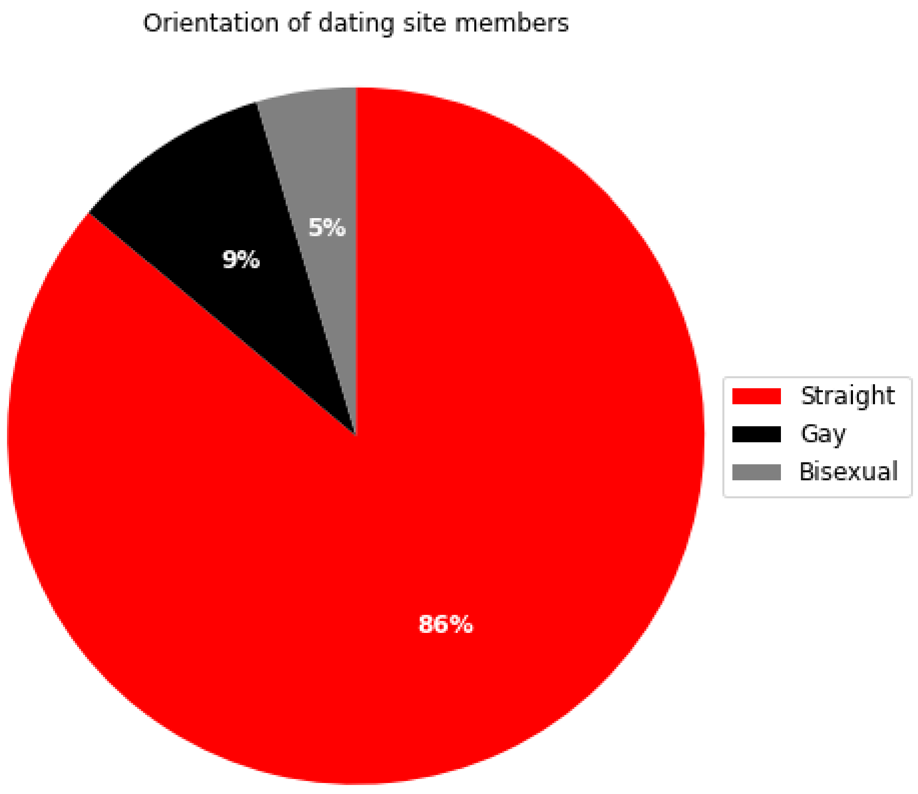
```
#dropping no response given by the index number as don't want to include this in the ch
art
orientation = orientation.drop(orientation.index[3])
orientation
```

Out[333]:

	orientation	orientation_count
0	straight	51603
1	gay	5573
2	bisexual	2767

In [334]:

```
#plotting pie chart
colors = ['red', 'black', 'grey']

plt.pie(orientation['orientation_count'], colors = colors, radius = 2.0, autopct = '%1.
0f%%', \
                          counterclock = False, startangle = -270, \
                         textprops = {'color': 'white', 'weight': 'bold', 'fontsize': 1
2})

#bbox_to_anchor moves the legend around depending on the numbers fed in
plt.legend(labels = ['Straight', 'Gay', 'Bisexual'], bbox_to_anchor = (1.8, 0.5), loc =
'right', fontsize = 12)


#the y = 1.3 shifts the title up above the chart
plt.title('Orientation of dating site members', y = 1.4, fontsize = 12)
plt.savefig('Orientation', bbox_inches = 'tight')
```



In [335]:

```
#grouping by sex
sex = dating_clean.groupby('sex').size().sort_values(ascending = False).to_frame().rese
t_index().rename(columns = {0: 'sex_count'})
sex
```

Out[335]:

	sex	sex_count
0	m	35826
1	f	24117
2	no response given	6

In [336]:

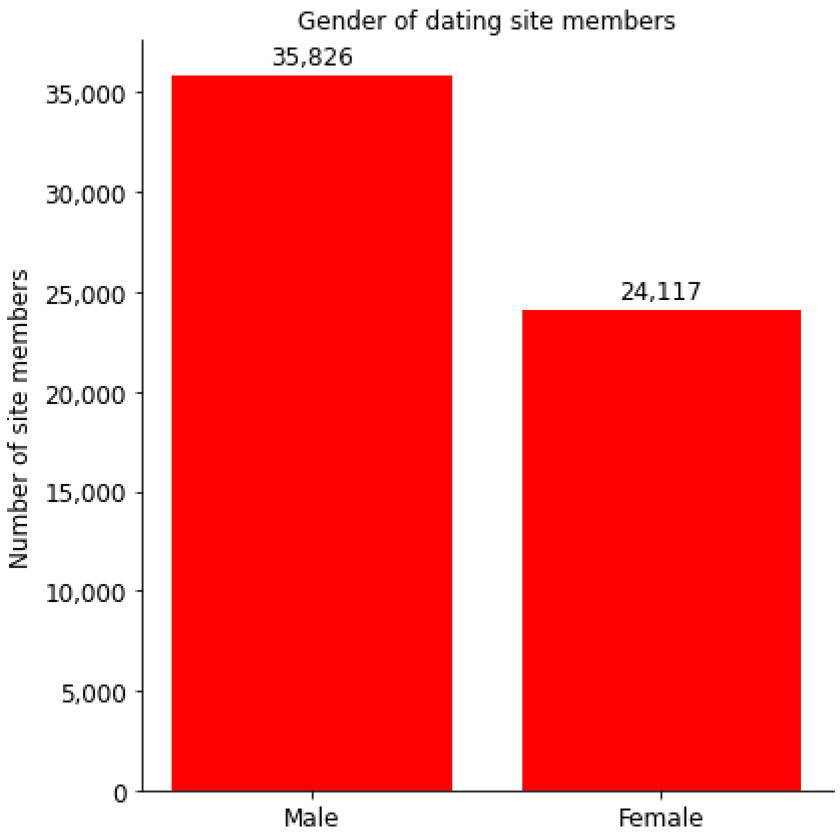
```
#dropping no response given
sex = sex.drop(sex.index[2])
sex
```

Out[336]:

	sex	sex_count
0	m	35826
1	f	24117

In [337]:

```
#creating a bar chart
sex_labels = ['Male', 'Female']

plt.figure(figsize = (6, 6))
ax = plt.subplot()
plt.bar(sex_labels, sex['sex_count'], color = 'red')

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)

#adding data labels for bars
bars = plt.bar(sex_labels, sex['sex_count'], color = 'red')

for bar in bars:
    yval = bar.get_height()
    #the '{:,}' command adds a thousand separator to the labels
    ax.annotate('{:,}'.format(yval),
    xy = (bar.get_x() + bar.get_width() / 2, yval),
    #shows label position on x and y axis
    xytext = (0, 3),
    textcoords = 'offset points', ha = 'center', va = 'bottom', fontsize = 12)

#this code adds a comma separater to the y tick marks
ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))

plt.xlabel('')
plt.xticks(sex_labels, fontsize = 12)
plt.ylabel('Number of site members', fontsize = 12)
plt.tick_params(axis = 'x', labelsize = 12)
plt.tick_params(axis = 'y', labelsize = 12)
plt.title('Gender of dating site members', fontsize = 12)
plt.tight_layout()
plt.savefig('Sex', bbox_inches = 'tight')
```



In [338]:

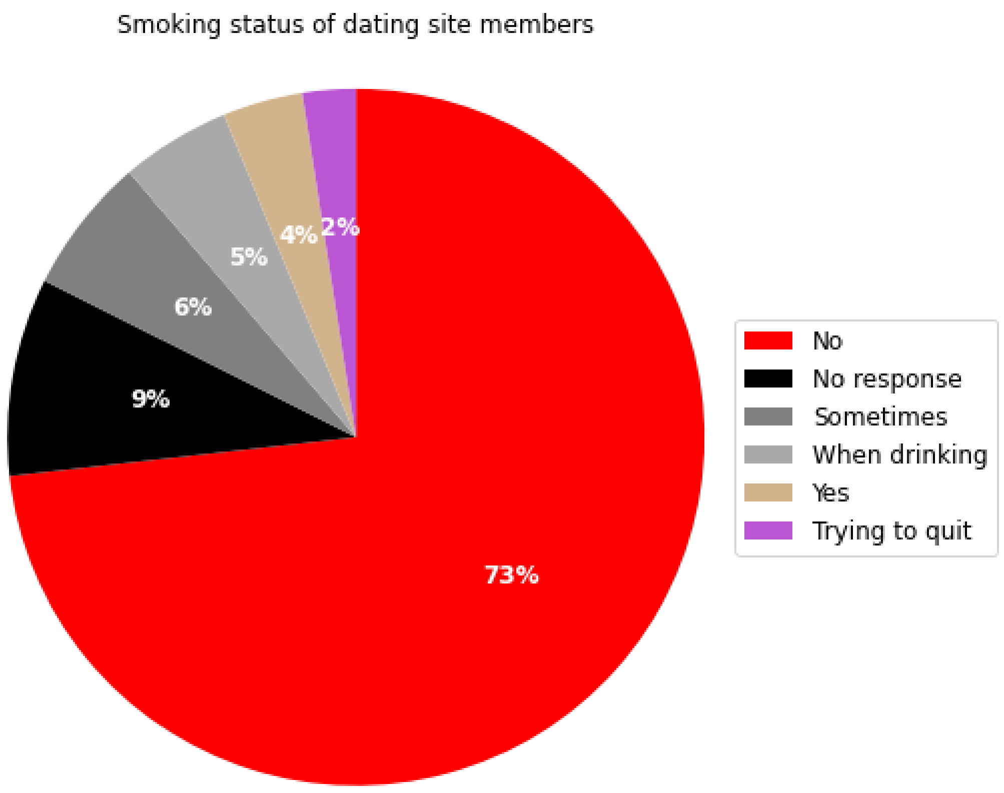
```
#grouping by smokes
smokes = dating_clean.groupby('smokes').size().sort_values(ascending = False).to_frame
().reset_index().rename(columns =

({0: 'count_smokers'}))
smokes
```

Out[338]:

	smokes	count_smokers
0	no	43893
1	no response given	5518
2	sometimes	3787
3	when drinking	3040
4	yes	2231
5	trying to quit	1480

In [339]:

```
#plotting pie chart
colors = ['red', 'black', 'grey', 'darkgrey', 'tan', 'mediumorchid']

plt.pie(smokes['count_smokers'], colors = colors, radius = 2.0, autopct = '%1.0f%%', \
                          counterclock = False, startangle = -270, \
                           textprops = {'color': 'white', 'weight': 'bold', 'fontsize':
12})

#bbox_to_anchor moves the legend around depending on the numbers fed in
plt.legend(labels = ['No', 'No response', 'Sometimes', 'When drinking', 'Yes', 'Trying
 to quit'], \
           bbox_to_anchor = (2.0, 0.5), loc = 'right', fontsize = 12)

#the y = 1.3 shifts the title up above the chart
plt.title('Smoking status of dating site members', y = 1.4, fontsize = 12)
plt.savefig('Smokers', bbox_inches = 'tight')
```



In [340]:

```
#grouping by status
status = dating_clean.groupby('status').size().sort_values(ascending = False).to_frame
().reset_index().rename(columns =

({0: 'count_status'}))
status
```

Out[340]:

	status	count_status
0	single	55695
1	seeing someone	2064
2	available	1864
3	married	310
4	unknown	10
5	no response given	6

In [341]:

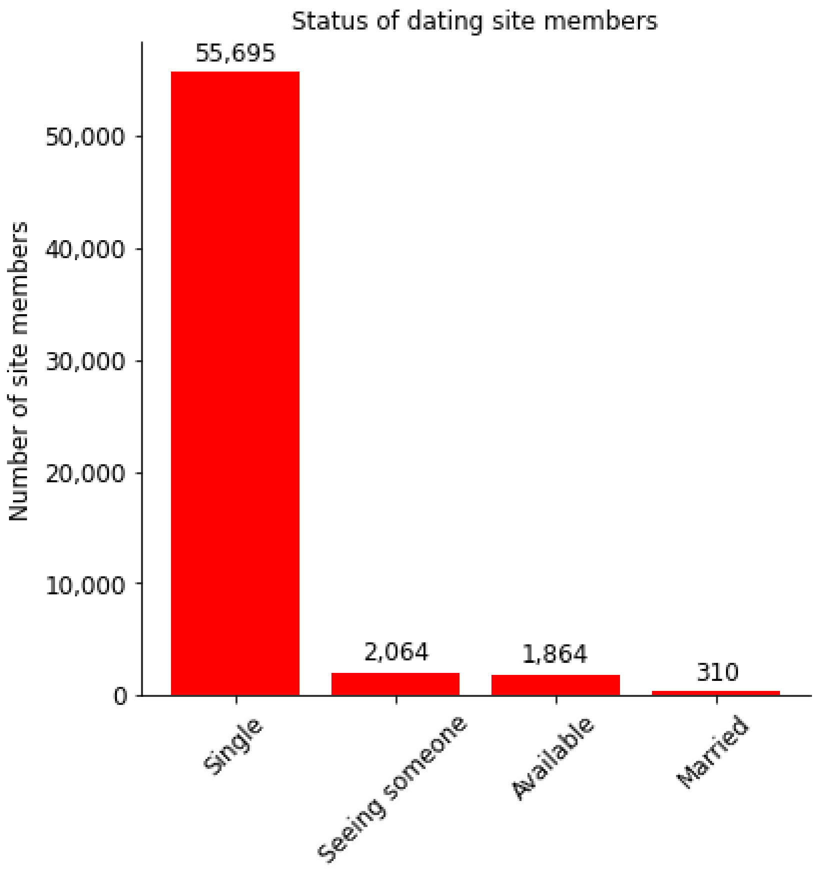
```
#dropping unknown and no response
status = status.drop(status.index[[4, 5]])
status
```

Out[341]:

	status	count_status
0	single	55695
1	seeing someone	2064
2	available	1864
3	married	310

In [342]:

```
#creating a bar chart
status_labels = ['Single', 'Seeing someone', 'Available', 'Married']

plt.figure(figsize = (6, 6))
ax = plt.subplot()

plt.bar(status_labels, status['count_status'], color = 'red')

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)

#adding data labels for bars
bars = plt.bar(status_labels, status['count_status'], color = 'red')

for bar in bars:
    yval = bar.get_height()
    #the '{:,}' command adds a thousand separator to the labels
    ax.annotate('{:,}'.format(yval),
    xy = (bar.get_x() + bar.get_width() / 2, yval),
    #shows label position on x and y axis
    xytext = (0, 3),
    textcoords = 'offset points', ha = 'center', va = 'bottom', fontsize = 12)


#this code adds a comma separater to the y tick marks
ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))

plt.xlabel('')
plt.xticks(status_labels, rotation = 45)
plt.tick_params(axis = 'x', labelsize = 12)
plt.tick_params(axis = 'y', labelsize = 12)
plt.ylabel('Number of site members', fontsize = 12)
plt.title('Status of dating site members', fontsize = 12)
plt.savefig('Status', bbox_inches = 'tight')
```


Status of dating site members
Number of site members
55,695
2,064
1,864
310
0
10,000
20,000
30,000
40,000
50,000
Single
Seeing someone
Available
Married

In [343]:

```
#who are the non-single people on the dating site?
not_single = dating_clean[(dating_clean['status'].str.contains('seeing someone') | dati
ng_clean['status'].str.contains\

('married'))]
not_single.head()
```

Out[343]:

	age	body_type	diet	drinks	drugs	education	ethnicity	height	incom
11	28	average	mostly anything	socially	never	graduated from college/university	white	72	4000
60	31	fit	mostly anything	socially	never	working on college/university	asian, pacific islander	67	-
77	25	curvy	no response given	socially	never	working on college/university	white	65	-
114	36	fit	strictly anything	often	sometimes	graduated from ph.d program	white	70	-
119	28	thin	mostly anything	socially	no response given	working on college/university	white	66	-

In [344]:

```
#creating a pivot table for chart
attached_pivot = not_single.pivot_table(columns = 'status',
                                        index = 'sex',
                                        aggfunc = 'size')
attached_pivot
```

Out[344]:

status	married	seeing someone
sex		
f	135	1003
m	175	1061

In [345]:

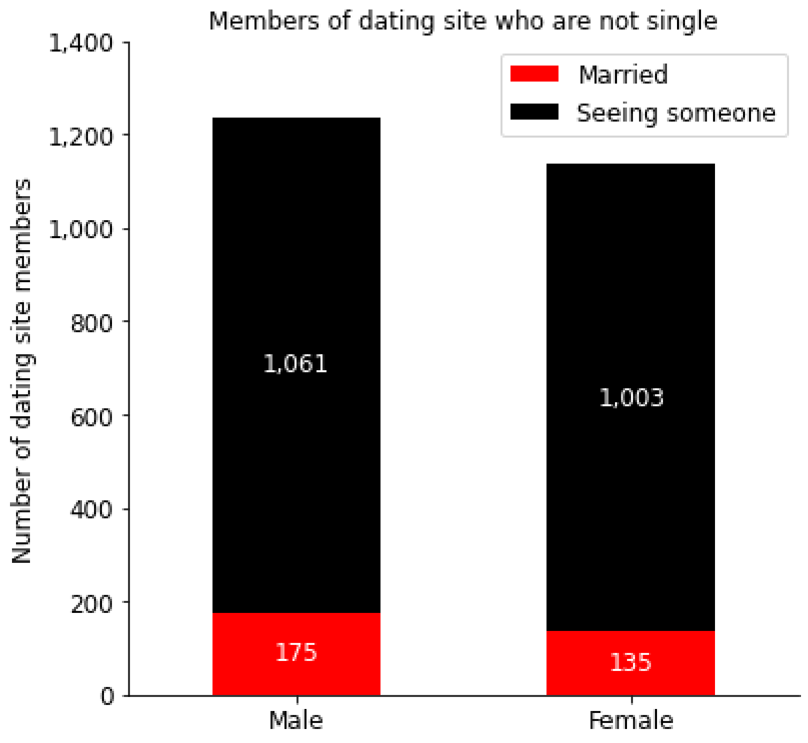
```
#sorting the pivot table
attached = attached_pivot.reindex(attached_pivot['married'].sort_values(ascending = Fal
se).index)
attached
```

Out[345]:

status	married	seeing someone
sex		
m	175	1061
f	135	1003

In [346]:

```
#creating stacked bar chart
x_labels = ['Male', 'Female']

ax = attached.plot.bar(stacked = True, color = ['red', 'black'], figsize = (6, 6))

#removing chart borders
ax.spines['top'].set_visible(False)
ax.spines['right'].set_visible(False)


# .patches is everything inside of the chart
for bar in ax.patches:
    # Find where everything is located
    height = bar.get_height()
    width = bar.get_width()
    x = bar.get_x()
    y = bar.get_y()

    # The height of the bar is the data value and can be used as the label
    label_text = '{:,.0f}'.format(height)

    # ax.text(x, y, text)
    label_x = x + width / 2
    label_y = y + height / 2

# plot only when height is greater than specified value
    if height > 0:
        ax.text(label_x, label_y, label_text, ha='center', va='center', fontsize=12, co
lor = 'white')

#this code adds a comma separater to the y tick marks
ax.yaxis.set_major_formatter(tcr.FuncFormatter(comma))

plt.xticks(range(0, len(attached.index)), x_labels, rotation = 360)
plt.xlabel('')
plt.ylim(0, 1400)
plt.ylabel('Number of dating site members', fontsize = 12)
plt.tick_params(axis = 'x', labelsize = 12)
plt.tick_params(axis = 'y', labelsize = 12)
plt.legend(['Married', 'Seeing someone'], fontsize = 12)
plt.title('Members of dating site who are not single', fontsize = 12)
plt.savefig('attached_members', bbox_inches = 'tight')
```


Members of dating site who are not single
Married
Seeing someone
Number of dating site members
1,400
1,200
1,000
800
600
400
200
0
1,061
175
1,003
135
Male
Female

```
In [ ]:
```

```
In [ ]:
```