In [369]:
```
from glob import iglob
import pandas as pd
import pandas_profiling
%matplotlib inline
from matplotlib import pyplot as plt
import seaborn as sns
from pylab import rcParams
rcParams['figure.figsize'] = 8, 5
import numpy as np
```

In [370]:
```
%config InlineBackend.figure_format = 'svg'
```

Задача: 2. Выбрать датасет и провести его анализ

- Выбрать данные
- Составить список вопросов, по которым хотелось бы получить ответ в виде графиков (и расширять этот список вопросов в процессе выполнения задания)
- Построить соответствующие визуализации

Выбрал данные.

Speed Dating Experiment What attributes influence the selection of a romantic partner?

Эксперимент по Быстрому Знакомству Какие атрибуты влияют на выбор романтического партнера?

https://www.kaggle.com/annavictoria/speed-dating-experiment/version/1 (https://www.kaggle.com/annavictoria/speed-dating-experiment/version/1)

In [398]:
```
file_name = 'speed_dating_data.csv'
dating_data = pd.read_csv(file_name, index_col=0 ,sep=',', encoding = "
```

In [399]:
```
dating_data.head(10)
```

Out[399]:

iid	id	gender	idg	condtn	wave	round	position	positin1	order	partner	...	attr3_3	sinc3
1	1.0	0	1	1	1	10	7	NaN	4	1	...	5.0	
1	1.0	0	1	1	1	10	7	NaN	3	2	...	5.0	
1	1.0	0	1	1	1	10	7	NaN	10	3	...	5.0	
1	1.0	0	1	1	1	10	7	NaN	5	4	...	5.0	
1	1.0	0	1	1	1	10	7	NaN	7	5	...	5.0	
1	1.0	0	1	1	1	10	7	NaN	6	6	...	5.0	
1	1.0	0	1	1	1	10	7	NaN	1	7	...	5.0	
1	1.0	0	1	1	1	10	7	NaN	2	8	...	5.0	
1	1.0	0	1	1	1	10	7	NaN	8	9	...	5.0	
1	1.0	0	1	1	1	10	7	NaN	9	10	...	5.0	

10 rows × 194 columns

In [400]:
```
print(dating_data.columns)
```

```
Index(['id', 'gender', 'idg', 'condtn', 'wave', 'round', 'position',
       'positin1', 'order', 'partner',
       ...
       'attr3_3', 'sinc3_3', 'intel3_3', 'fun3_3', 'amb3_3', 'attr5_
3',
       'sinc5_3', 'intel5_3', 'fun5_3', 'amb5_3'],
      dtype='object', length=194)
```

Выполним профайлинг данных

Вынужден был отключить вывод информации `pandas_profiling.ProfileReport` так как не генерился PDF файл из notebook для корректного и удобного представления информации. .

In [1]:
```
# pandas_profiling.ProfileReport(dating_data)
```

После внимательного изучения файла `speed_dating_data_Key.doc`

и просмотра статистики `ProfileReport`

Описание значение столбцов которые показались наиболее интересные.

- `iid` - unique subject number, group(wave id gender)
- `id` - subject number within wave
- `gender` - Female=0 Male=1
- `round` - number of people that met in wave
- `order` - the number of date that night when met partner
- `partner` - partner's id number the night of event
- `match` - 1=yes, 0=no
- `age_o` - age of partner
- `dec_o` - decision of partner the night of event
- `attr_o` - rating by partner the night of the event, for all 6 attributes
- `age` - age
- `field` - field of study

```
1= Law
2= Math
3= Social Science, Psychologist
4= Medical Science, Pharmaceuticals, and Bio Tech
5= Engineering
6= English/Creative Writing/ Journalism
7= History/Religion/Philosophy
8= Business/Econ/Finance
9= Education, Academia
10= Biological Sciences/Chemistry/Physics
11= Social Work
12= Undergrad/undecided
13=Political Science/International Affairs
14=Film
15=Fine Arts/Arts Administration
16=Languages
17=Architecture
18=Other
```

- `goal` - What is your primary goal in participating in this event?

```
Seemed like a fun night out=1
To meet new people=2
To get a date=3
Looking for a serious relationship=4
To say I did it=5
Other=6
```

- `date` - In general, how frequently do you go on dates?

```
Several times a week=1
Twice a week=2
Once a week=3
Twice a month=4
Once a month=5
Several times a year=6
Almost never=7
```

- `go_out` - How often do you go out (not necessarily on dates)?

```
Several times a week=1
Twice a week=2
Once a week=3
Twice a month=4
Once a month=5
Several times a year=6
Almost never=7
```

- `career` -What is your intended career?
- `career_c` : career coded

```
1= Lawyer
2= Academic/Research
3= Psychologist
4= Doctor/Medicine
5=Engineer
6= Creative Arts/Entertainment
7= Banking/Consulting/Finance/Marketing/Business/CEO/Entrepreneur/Admin
8= Real Estate
9= International/Humanitarian Affairs
10= Undecided
11=Social Work
12=Speech Pathology
13=Politics
14=Pro sports/Athletics
15=Other
16=Journalism
17=Architecture
```

In [377]:
```
# Вывод данных которые наиболее интересные.
dating_data = dating_data[['id', 'gender','age','career', 'round',
             'order', 'partner', 'match', 'age_o', 'dec_o', 'field','goa
            ]]
dating_data.head()
```

Out[377]:

iid	id	gender	age	career	round	order	partner	match	age_o	dec_o	field	goal	date	g
1	1.0	0	21.0	lawyer	10	4	1	0	27.0	0	Law	2.0	7.0	
1	1.0	0	21.0	lawyer	10	3	2	0	22.0	0	Law	2.0	7.0	
1	1.0	0	21.0	lawyer	10	10	3	1	22.0	1	Law	2.0	7.0	
1	1.0	0	21.0	lawyer	10	5	4	1	23.0	1	Law	2.0	7.0	
1	1.0	0	21.0	lawyer	10	7	5	1	24.0	1	Law	2.0	7.0	

Feature_engineering (Преобразование значений и названий столбцов)

In [378]:
```
def _feature_engineering_job_by_career_and_field_columns(row):
    """
    Результате работы ``pandas_profiling.ProfileReport`` показал основны

    ``career`` -What is your intended career?
    ``field`` - field of study

    1. Lawyer   154 0.0% | Law  121 0.0% | Law  462 0.0% | law  123 0.0%
    2. professor    199 0.0% | Professor |  Academic    |    Scientist
    3. Finance  202 0.0% | Business 521 0.0%  | business    110 0.0% | B
    4. Consulting   147 0.0% |  Social Worker   136 0.0%
    5. Other values (357)   6887    0.0%


    1. Social Work  378 0.0%
    2. International Affairs    252 0.0%
    3. Electrical Engineering   164 0.0% | Engineering
    4. Psychology   139 0.0%
    """
    career = str(row['career']).lower()
    field = str(row['field']).lower()

    job = career

    for i in range(2):
        if job in ['lawyer', 'law']:
            return 'lawyer'
        if 'lawyer' in job:
            return 'lawyer'
        if job in ['professor', 'academic', 'scientist', 'economic']:
            return 'scientist'
        if 'academic' in job:
            return 'scientist'
        if 'scientist' in job:
            return 'scientist'
        if job in ['finance', 'business', 'mba', 'economist']:
            return 'finance'
        if 'business' in job:
            return 'business'
        if 'bank' in 'job':
            return 'business'
        if job in ['social', 'consulting']:
            return 'social'
        if 'social' in job:
            return 'social'
        if 'engineer' in job:
            return 'engineer'
        if 'psychology' in job:
            return 'psychology'
        if 'teach' in job:
            return 'teacher'
        job = field

    # Default action return small len career or field
    if len(career) < len(field):
        return career
```

```
    return field
```

In [379]:
```
def feature_engineering_clean_data_convert_values(dating_data):

    # gender - Female=0 Male=1
    dating_data['gender'] = dating_data['gender'].apply(lambda x: 'F' i

    # feature engineering job by career and field columns
    dating_data['job'] = dating_data.apply(_feature_engineering_job_by_

    # drop unused column
    dating_data = dating_data.drop(columns=['career', 'field'])

    return dating_data
```

In [380]:
```
dating_data = feature_engineering_clean_data_convert_values(dating_data
```

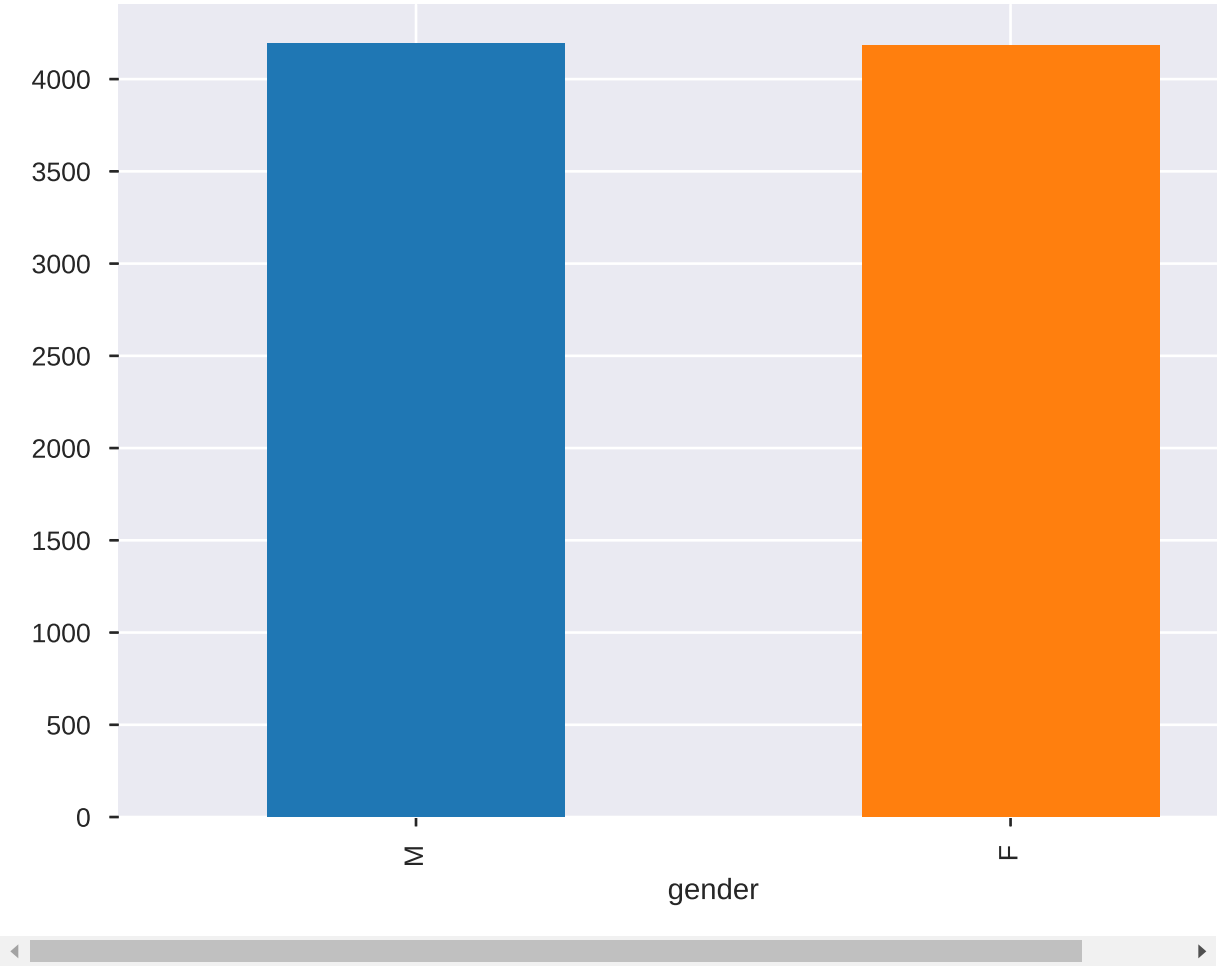
In [381]:
```
dating_data.head()
```

Out[381]:

iid	id	gender	age	round	order	partner	match	age_o	dec_o	goal	date	go_out	job
1	1.0	F	21.0	10	4	1	0	27.0	0	2.0	7.0	1.0	lawyer
1	1.0	F	21.0	10	3	2	0	22.0	0	2.0	7.0	1.0	lawyer
1	1.0	F	21.0	10	10	3	1	22.0	1	2.0	7.0	1.0	lawyer
1	1.0	F	21.0	10	5	4	1	23.0	1	2.0	7.0	1.0	lawyer
1	1.0	F	21.0	10	7	5	1	24.0	1	2.0	7.0	1.0	lawyer

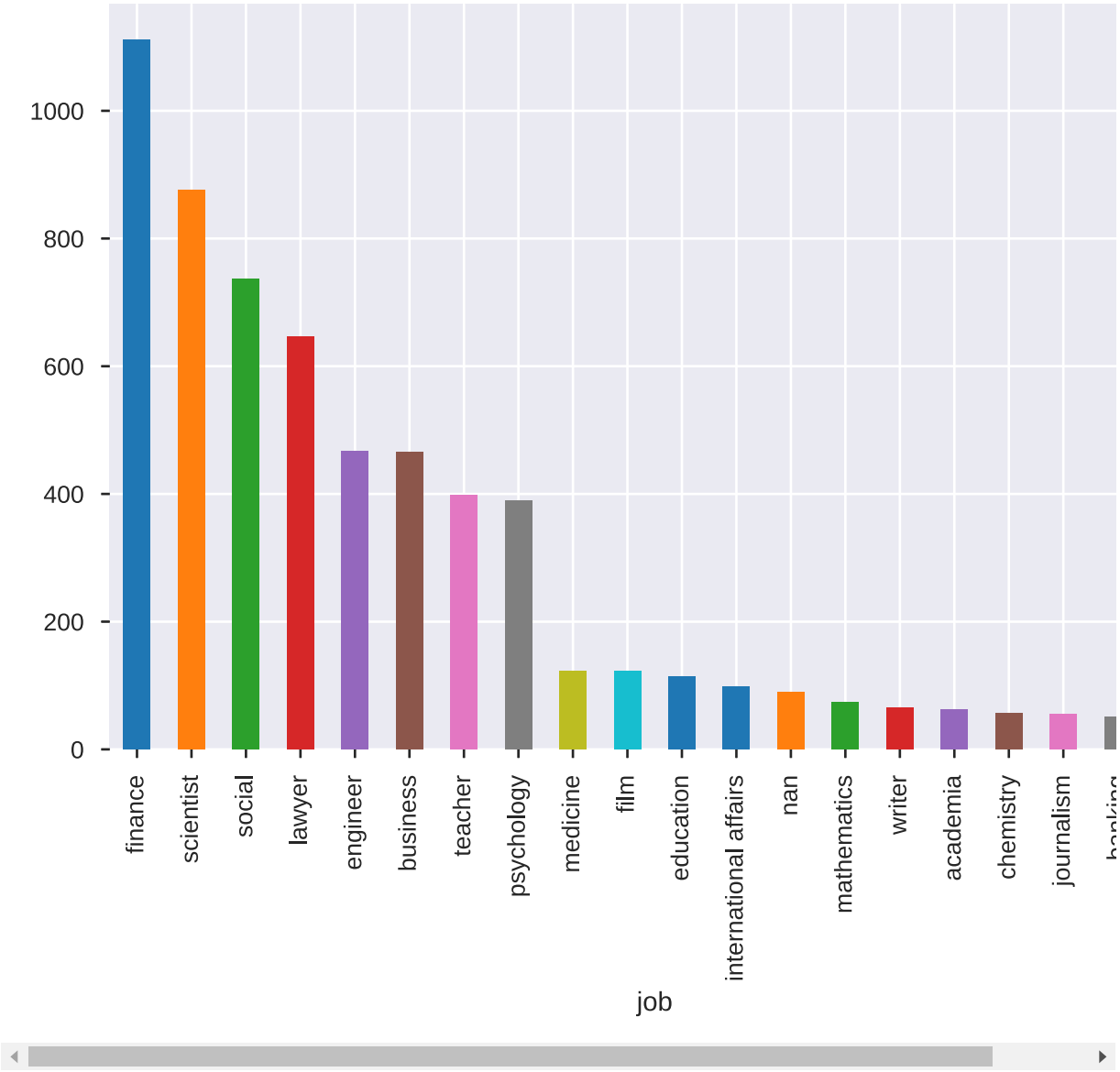
Кто больше приходи на быстрые свидания, мужчины или женьщины ?

In [382]:
```
total = dating_data.groupby(['gender']).count().sort_values('id', ascen
total.plot.bar()
plt.show()
```



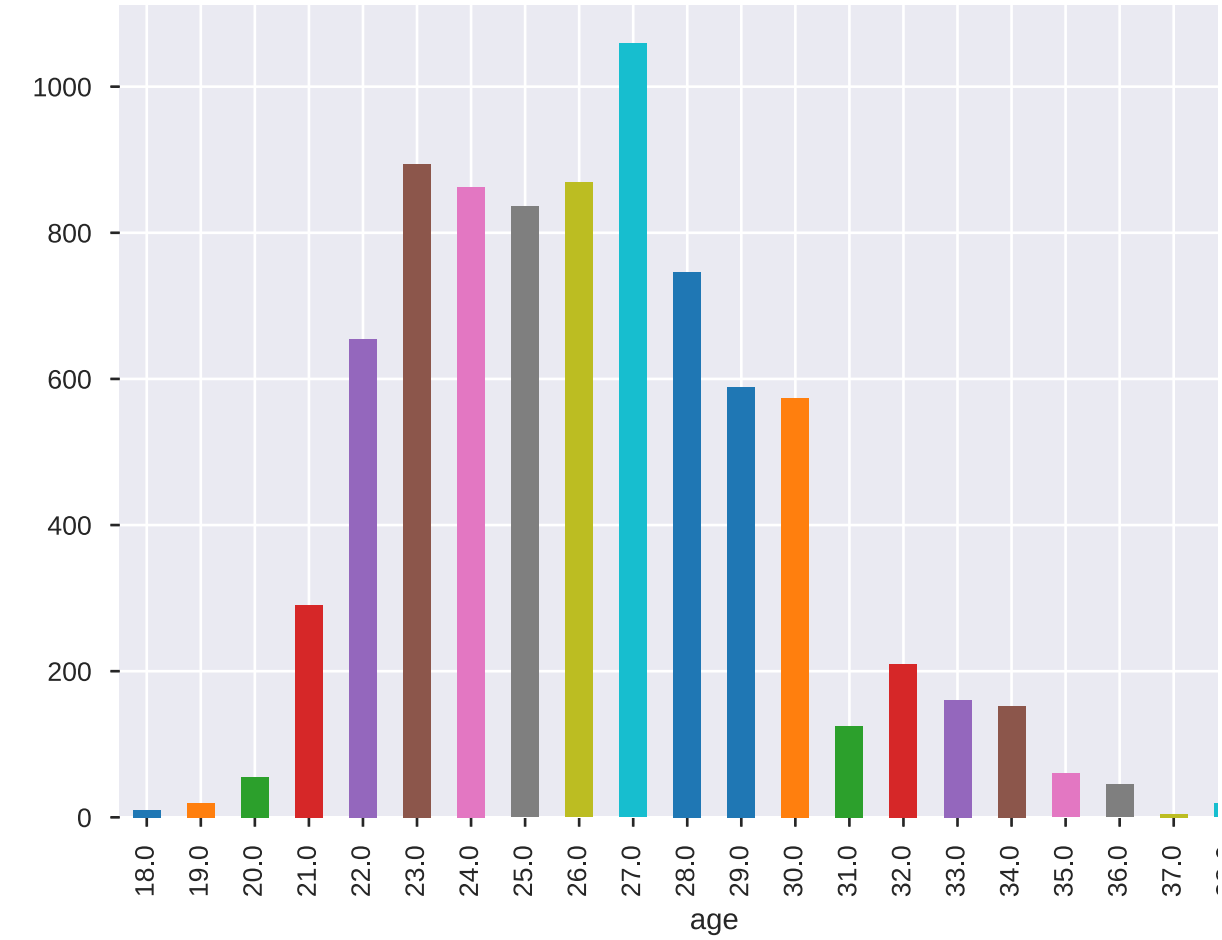
В какой сфере работают люди, участники '"быстрых свиданий"' Составить топ 20

In [383]:
```
total = dating_data.groupby(['job']).count().sort_values('id', ascendin
total.plot.bar()
plt.show()
```



В каком возрасте мужчины и женщины идуи на быстрые свидания?

In [384]:
```
total = dating_data.groupby(['age']).count().sort_values('age', ascendi
total.plot.bar()
plt.show()
```



1. Сколько раз женщины были выбраны мужчинами которых они не выбирали?

2. Сколько раз мужчины были выбраны женщинами которых они не выбирали?

In [385]:
```
gender_match_dec_o = dating_data[['gender', 'match', 'dec_o']]
```

In [386]:
```
female_not_match = gender_match_dec_o[np.logical_and(gender_match_dec_o
male_not_match = gender_match_dec_o[np.logical_and(gender_match_dec_o.g
```

In [387]:
```
female_not_match_have_been_matched = female_not_match[female_not_match.
male_not_match_have_been_matched = male_not_match[male_not_match.dec_o =
```

In [388]:
```
print("Итого: без взаимности было выбрано женщин:")
print(female_not_match_have_been_matched.shape[0])
print("Итого: без взаимности было выбрано мужчин:")
print(male_not_match_have_been_matched.shape[0])
```

```
Итого: без взаимности было выбрано женщин:
1296
Итого: без взаимности было выбрано мужчин:
839
```

Сколько взаимных симпатий было в зависимости от возраста?

In [389]:
```
age_gender_match = dating_data[['age', 'match', 'gender']]
```

In [390]:
```
age_gender_matched = age_gender_match[age_gender_match.match == 1]
```

In [391]:
```
age_gender_matched_sorted = age_gender_matched.groupby(['age', 'gender'
age_gender_matched_sorted = age_gender_matched_sorted.reset_index()
plt.plot(
    age_gender_matched_sorted[age_gender_matched_sorted.gender == 'F'][
    age_gender_matched_sorted[age_gender_matched_sorted.gender == 'F'].r
)

plt.plot(
    age_gender_matched_sorted[age_gender_matched_sorted.gender == 'M'][
    age_gender_matched_sorted[age_gender_matched_sorted.gender == 'M'].r
)
plt.title('Количество взаимных симпатий было в зависимости от возраста.
plt.xlabel('Возраст')
plt.ylabel('Количество взаимных симпатий')
plt.legend()
plt.show()
```

1. Какова основная цель участия в этом мероприятии у женщин?

2. Какова основная цель участия в этом мероприятии у мужчин?

- `goal` - What is your primary goal in participating in this event?

```
Seemed like a fun night out=1
To meet new people=2
To get a date=3
Looking for a serious relationship=4
To say I did it=5
Other=6
```

In [392]:
```
goal_id_gender = dating_data[['goal', 'id', 'gender']]
```

In [393]:
```
dating_goal_female = goal_id_gender[goal_id_gender['gender'] == 'F']
dating_goal_male = goal_id_gender[goal_id_gender['gender'] == 'M']
```

In [394]:
```
dating_goal_count_female = dating_goal_female.groupby(['goal']).count()
dating_goal_count_male = dating_goal_male.groupby(['goal']).count()[['i
plt.plot(
    dating_goal_count_female['goal'],
    dating_goal_count_female.id, label='Female'
)

plt.plot(
    dating_goal_count_male['goal'],
    dating_goal_count_male.id, label='Male'
)
plt.title('Количество: основная цель участия в этом мероприятии (F & M)
plt.xlabel('Цель участия в этом мероприятии')
plt.ylabel('Количество человек выбрали данную цель.')
plt.text(3, 1200, ' - Seemed like a fun night out=1 \n - To meet new pe
plt.legend()
plt.show()
```