SCiPy: We have a min and max temprature in a city in india for each months of the year .We would like to find a function to describe this and show it graphically, the dataset given below . Task:

1. fitting it to the periodic function
2. plot the fit

Data:

Max=39,41,43,47,49,51,45,38,37,29,27,25

Min=21,23,27,28,32,35,31,28,21,19,17,18

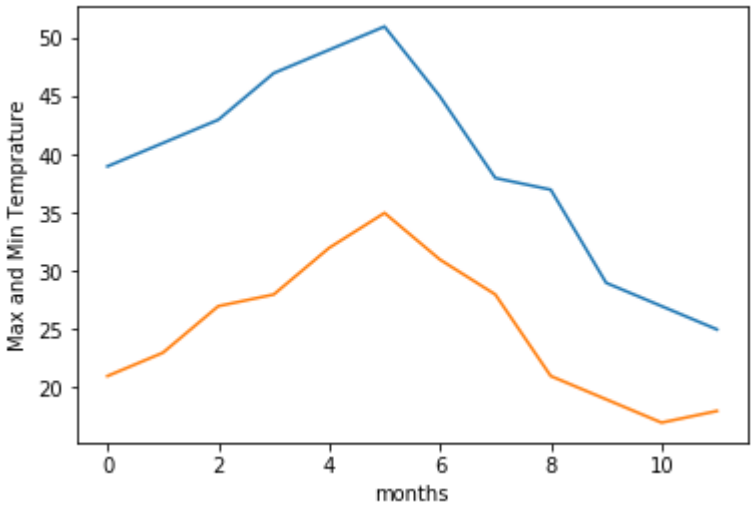
In [46]:
```
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

In [48]:
```
months=np.arange(12)
```

In [55]:
```
Max_temp=np.array([39,41,43,47,49,51,45,38,37,29,27,25])
Min_temp=np.array([21,23,27,28,32,35,31,28,21,19,17,18])
```

In [56]:
```
plt.plot(months,Max_temp)
plt.plot(months,Min_temp)
plt.xlabel('months')
plt.ylabel('Max and Min Temprature')
```

Out[56]:
```
Text(0,0.5,'Max and Min Temprature')
```



1. fitting it to a periodic function

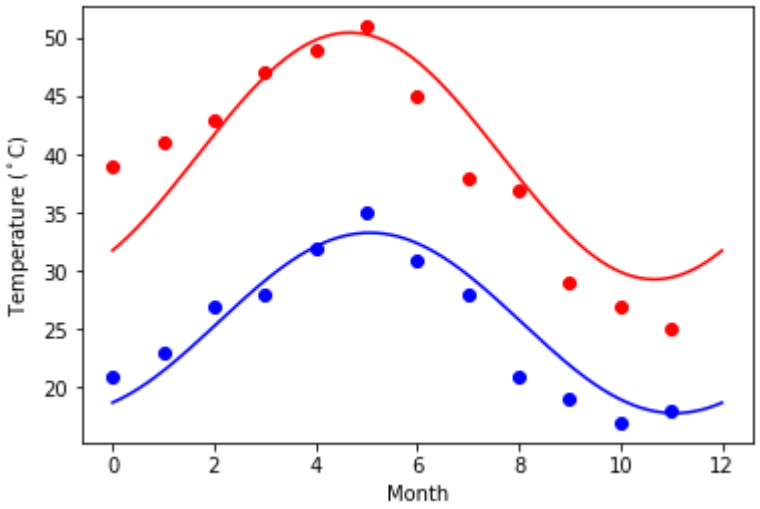
In [57]:
```
from scipy import optimize
def yearly_temps(times, avg, ampl, time_offset):
    return (avg + ampl * np.cos((times + time_offset) * 2 * np.pi / times.max()))

res_max, cov_max = optimize.curve_fit(yearly_temps, months,Max_temp, [20, 10, 0])
res_min, cov_min = optimize.curve_fit(yearly_temps, months,Min_temp, [-40, 20, 0])
```

In [58]:
```
days = np.linspace(0, 12, num=365)

plt.figure()
plt.plot(months, Max_temp, 'ro')
plt.plot(days, yearly_temps(days, *res_max), 'r-')
plt.plot(months, Min_temp, 'bo')
plt.plot(days, yearly_temps(days, *res_min), 'b-')
plt.xlabel('Month')
plt.ylabel('Temperature ($^\circ$C)')

plt.show()
```



matplotlib:

1. create a pie chart presenting the male/female proportion
2. create a scatterplot with the Fare paid and the age, differ the plot color by gender

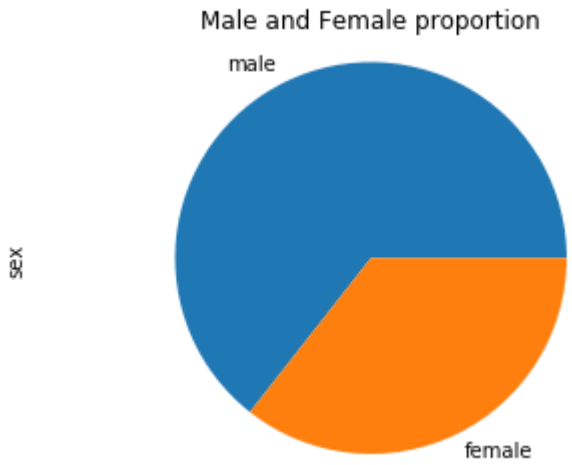
In [69]:
```
import pandas as pd
titanic=pd.read_csv("https://raw.githubusercontent.com/Geoyi/Cleaning-Titanic-Data
titanic.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1310 entries, 0 to 1309
Data columns (total 14 columns):
pclass       1309 non-null float64
survived     1309 non-null float64
name         1309 non-null object
sex          1309 non-null object
age          1046 non-null float64
sibsp        1309 non-null float64
parch        1309 non-null float64
ticket       1309 non-null object
fare         1308 non-null float64
cabin        295 non-null object
embarked     1307 non-null object
boat         486 non-null object
body         121 non-null float64
home.dest    745 non-null object
dtypes: float64(7), object(7)
memory usage: 143.4+ KB
```

1.create a pie chart presenting the male/female proportion

In [70]:
```
titanic.sex.value_counts().plot(kind='pie')
plt.axis('equal')
plt.title('Male and Female proportion')
```

Out[70]:
```
Text(0.5,1,'Male and Female proportion')
```



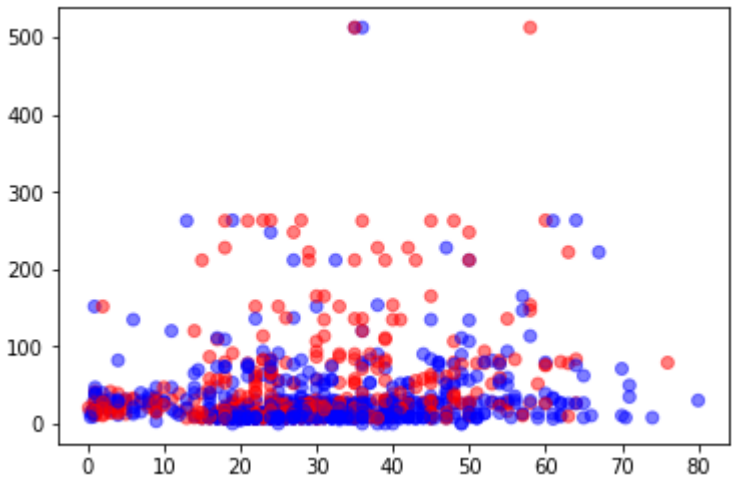
2. create a scatterplot with the Fare paid and the age, differ the plot color by gender

In [65]:
```
titanic=titanic.dropna(subset=['sex'])
```

In [66]:
```
mapping={'male':'blue','female':'red'}
```

In [68]:
```
plt.scatter(titanic['age'],titanic['fare'],alpha=0.5,c=titanic['sex'].map(mapping)
```

Out[68]:
```
<matplotlib.collections.PathCollection at 0x1c4bd68a518>
```



In [ ]:
```

```