In [3]:
```
import pandas as pd
import matplotlib.pyplot as plt
from sklearn import linear_model
```

In [4]:
```
df = pd.read_csv('C:/Users/nisho/Documents/SEM 5/ML and core applications/Life Ex
df.head()
```

Out[4]:

infant eaths	Alcohol	percentage expenditure	Hepatitis B	Measles	...	Polio	Total expenditure	Diphtheria	HIV/AIDS	
62	0.01	71.279624	65.0	1154	...	6.0	8.16	65.0	0.1	584.259
64	0.01	73.523582	62.0	492	...	58.0	8.18	62.0	0.1	612.696
66	0.01	73.219243	64.0	430	...	62.0	8.13	64.0	0.1	631.744
69	0.01	78.184215	67.0	2787	...	67.0	8.52	67.0	0.1	669.959
71	0.01	7.097109	68.0	3013	...	68.0	7.87	68.0	0.1	63.537

In [5]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2938 entries, 0 to 2937
Data columns (total 22 columns):
 #   Column                           Non-Null Count  Dtype  
---  ------                           --------------  -----  
 0   Country                          2938 non-null   object 
 1   Year                             2938 non-null   int64  
 2   Status                           2938 non-null   object 
 3   Life expectancy                  2928 non-null   float64
 4   Adult Mortality                  2928 non-null   float64
 5   infant deaths                    2938 non-null   int64  
 6   Alcohol                          2744 non-null   float64
 7   percentage expenditure           2938 non-null   float64
 8   Hepatitis B                      2385 non-null   float64
 9   Measles                          2938 non-null   int64  
 10   BMI                             2904 non-null   float64
 11  under-five deaths                2938 non-null   int64  
 12  Polio                            2919 non-null   float64
 13  Total expenditure                2712 non-null   float64
 14  Diphtheria                       2919 non-null   float64
 15   HIV/AIDS                        2938 non-null   float64
 16  GDP                              2490 non-null   float64
 17  Population                       2286 non-null   float64
 18   thinness  1-19 years            2904 non-null   float64
 19   thinness 5-9 years             2904 non-null   float64
 20  Income composition of resources  2771 non-null   float64
 21  Schooling                        2775 non-null   float64
dtypes: float64(16), int64(4), object(2)
memory usage: 505.1+ KB
```

In [6]:
```
df.drop(['Country', 'Status'], axis=1, inplace=True)
df.head()
```

Out[6]:

	Year	Life expectancy	Adult Mortality	infant deaths	Alcohol	percentage expenditure	Hepatitis B	Measles	BMI	under-five deaths	Pol
0	2015	65.0	263.0	62	0.01	71.279624	65.0	1154	19.1	83	6
1	2014	59.9	271.0	64	0.01	73.523582	62.0	492	18.6	86	58
2	2013	59.9	268.0	66	0.01	73.219243	64.0	430	18.1	89	62
3	2012	59.5	272.0	69	0.01	78.184215	67.0	2787	17.6	93	67
4	2011	59.2	275.0	71	0.01	7.097109	68.0	3013	17.2	97	68

In [7]:
```
df.isnull().values.any()
```

Out[7]:
```
True
```

In [8]:
```
df.isna().any()
```

Out[8]:
```
Year                               False
Life expectancy                     True
Adult Mortality                     True
infant deaths                      False
Alcohol                             True
percentage expenditure             False
Hepatitis B                         True
Measles                            False
 BMI                                True
under-five deaths                  False
Polio                               True
Total expenditure                   True
Diphtheria                          True
 HIV/AIDS                          False
GDP                                 True
Population                          True
 thinness  1-19 years               True
 thinness 5-9 years                 True
Income composition of resources     True
Schooling                           True
dtype: bool
```

In [9]:
```
df['Adult Mortality'].fillna(df['Adult Mortality'].median(), inplace=True)
```

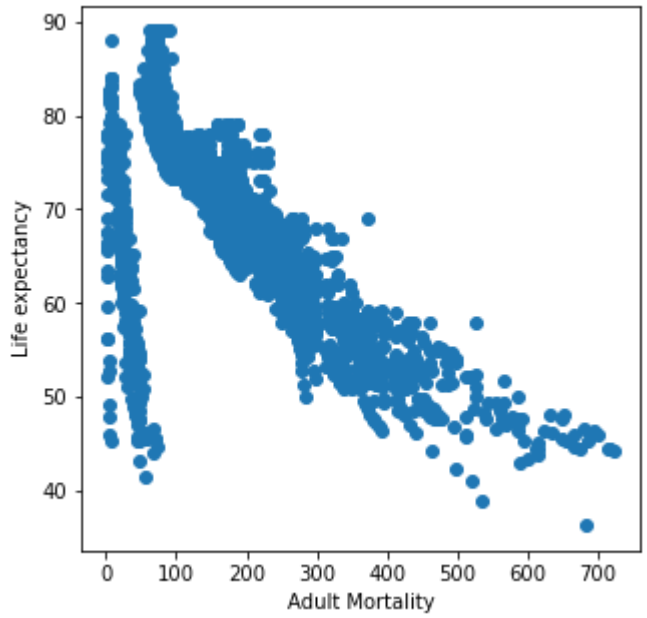
In [10]:
```
df['Life expectancy '].fillna(df['Life expectancy '].median(), inplace=True)
```

In [11]:
```
df['Hepatitis B'].fillna(df['Hepatitis B'].median(), inplace=True)
```

In [12]:
```
df['Polio'].fillna(df['Polio'].median(), inplace=True)
```

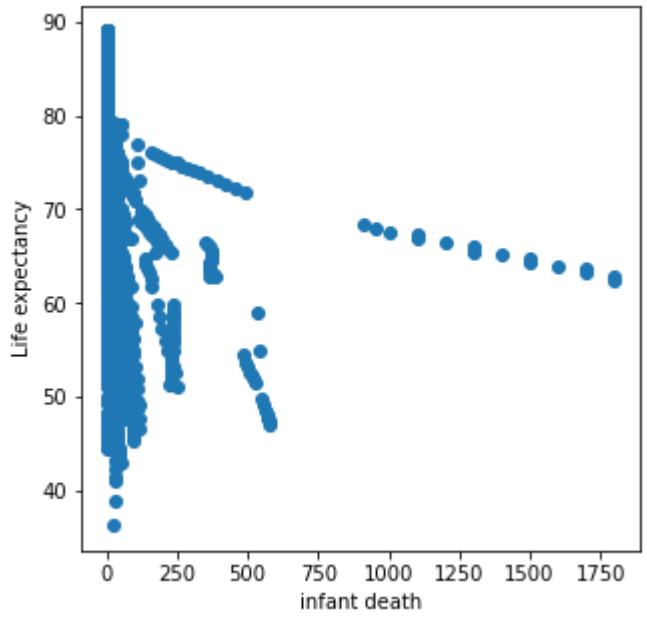
In [13]:
```
plt.figure(figsize=(5,5))
plt.xlabel('Adult Mortality')
plt.ylabel('Life expectancy')
plt.scatter(df['Adult Mortality'], df['Life expectancy '])
```

Out[13]:
```
<matplotlib.collections.PathCollection at 0x1d01055a4c0>
```



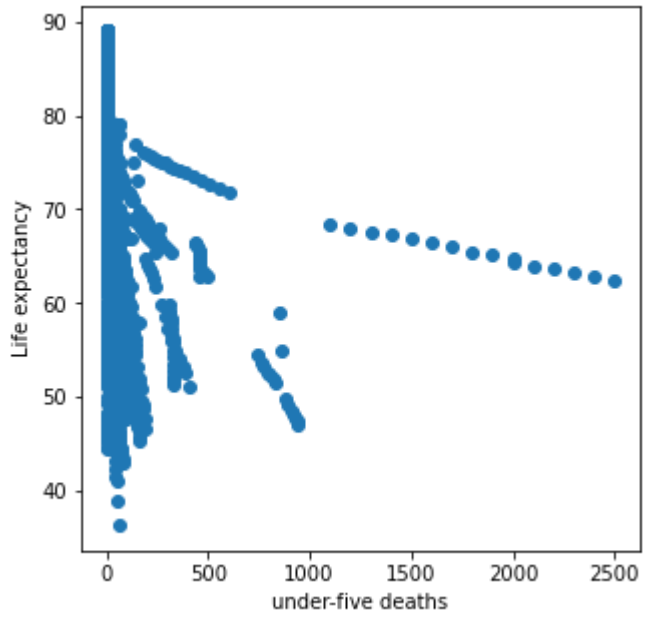
In [14]:
```
plt.figure(figsize=(5,5))
plt.xlabel('infant death')
plt.ylabel('Life expectancy')
plt.scatter(df['infant deaths'], df['Life expectancy '])
```

Out[14]:
```
<matplotlib.collections.PathCollection at 0x1d010695d00>
```



In [15]:
```
plt.figure(figsize=(5,5))
plt.xlabel('under-five deaths')
plt.ylabel('Life expectancy')
plt.scatter(df['under-five deaths '], df['Life expectancy '])
```

Out[15]:
```
<matplotlib.collections.PathCollection at 0x1d0106f6fd0>
```



In [16]:
```
model = linear_model.LinearRegression().fit(df[['Adult Mortality', 'infant deaths
```

In [17]:
```
model.coef_
```

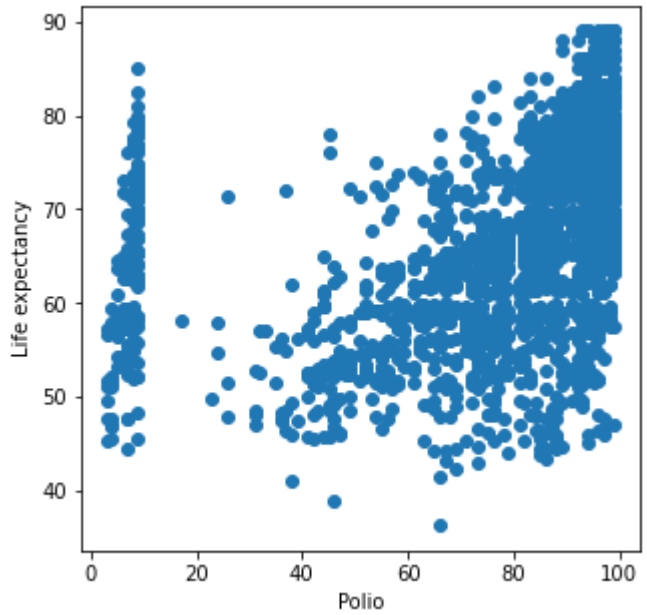
Out[17]:
```
array([-0.04954221,  0.18538215, -0.14538407])
```

In [18]:
```
model.intercept_
```

Out[18]:
```
77.88910698885105
```

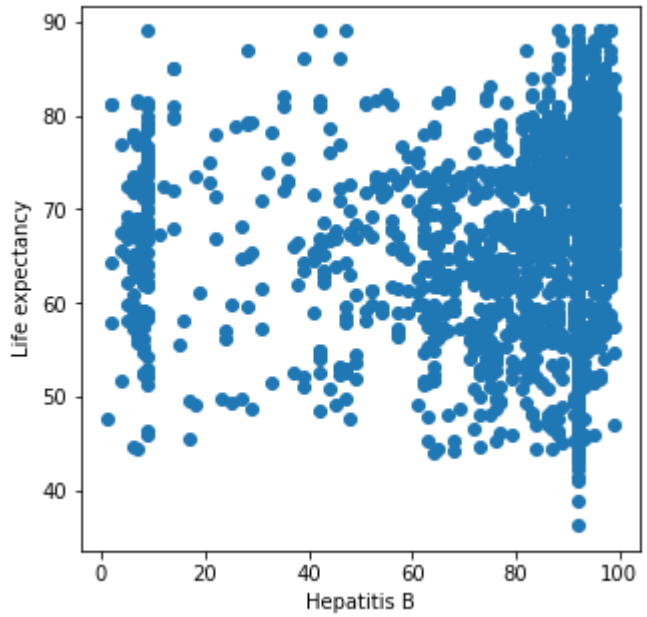
In [19]:
```
plt.figure(figsize=(5,5))
plt.xlabel('Polio')
plt.ylabel('Life expectancy')
plt.scatter(df['Polio'], df['Life expectancy '])
```

Out[19]:
```
<matplotlib.collections.PathCollection at 0x1d01077a4c0>
```



In [20]:
```
plt.figure(figsize=(5,5))
plt.xlabel('Hepatitis B')
plt.ylabel('Life expectancy')
plt.scatter(df['Hepatitis B'], df['Life expectancy '])
```

Out[20]:
```
<matplotlib.collections.PathCollection at 0x1d010e4f580>
```



In [21]:
```
model2 = linear_model.LinearRegression().fit(df[['Adult Mortality', 'infant death
```

In [22]:
```
model2.coef_
```

Out[22]:
```
array([-0.04540593,  0.14347081, -0.11237082,  0.10245096, -0.0083418 ])
```

In [23]:
```
model2.intercept_
```

Out[23]:
```
69.31838278076285
```

In [ ]: