Importing Libraries

In [1]:

```
#library to use pd and np
#library to use plt
import pandas as pd
import glob
import numpy as np
import operator
import matplotlib.pyplot as plt
import os
```

Data Gathering

The following information was accumulated through the World Health Organization's (WHO) International Agency for Research on Cancer saved in a CSV file, which provides the succeeding data presented below.

In [2]:

```
#Data Imports. Paths should be changed based on the folder location of the csv fi
female = pd.read_csv(r"data female.csv")
male = pd.read_csv(r'data male.csv')
cancer = pd.read_csv(r"data all.csv")

#Places each gathered age csv into a list.
#path = r'C:\Users\admin\Desktop\Python\DATA' # use your path
#all_files = glob.glob(path + "/*.csv")

li = []

#for filename in all_files:
#    df = pd.read_csv(filename, index_col=None, header=0)
#    li.append(df)

a = pd.read_csv(r"age0_9.csv")
li.append(a)
b = pd.read_csv(r"age10_19.csv")
li.append(b)
c = pd.read_csv(r"age20_29.csv")
li.append(c)
d = pd.read_csv(r"age30_39.csv")
li.append(d)
e = pd.read_csv(r"age40_49.csv")
li.append(e)
f = pd.read_csv(r"age50_59.csv")
li.append(f)
g = pd.read_csv(r"age60_69.csv")
li.append(g)
h = pd.read_csv(r"age70+.csv")
li.append(h)
```

In [3]:

```
frame = pd.concat(li, axis=0, ignore_index=True)
frame.drop(["Number","Cum. risk**"],axis=1,inplace=True) #Removes Uncessary colum
frame
#combined datasets from the list into a single data set.
```

Out[3]:

	ICD	Cancer	Uncertainty interval	Crude Rate*	ASR (World)*
0	Allcancersexcl.non-melanomaskincancer	2497	11.30	11.60	0.11
1	Leukaemia	1340	6.10	6.20	0.06
2	Brain,centralnervoussystem	267	1.20	1.20	0.01
3	Non-Hodgkinlymphoma	150	0.68	0.67	0.01
4	Kidney	117	0.53	0.58	0.01
...	...	...	...	...	...
256	Hodgkinlymphoma	43	1.20	1.30	-
257	Vagina	26	1.20	1.20	-
258	Penis	23	1.70	1.80	-
259	Mesothelioma	20	0.56	0.60	-
260	Testis	18	1.30	1.30	-

261 rows × 5 columns

Data Cleansing

After gathering the data, the insignificant data are identified to be filtered from the table/model to determine and answer the project objectives by removing them using the drop function.

In [4]:

```
#Removes redundant and unusable data from the dataset.
for x in range(len(li)):
    li[x].drop("C00-97/C44" , axis=0, inplace=True)
    li[x].drop(["Number","Cum. risk**","Uncertainty interval","Crude Rate*","ASR
    li[x] = li[x].rename(columns={'Cancer': 'Cases', 'ICD': 'Type of Cancer'})

male.drop(["Number","Cum. risk**","Uncertainty interval","Crude Rate*","ASR (Worl
male.drop("C00-97/C44", axis=0, inplace=True)
male = male.rename(columns={'Cancer':'Cases','ICD': 'Type of Cancer'})

female.drop(["Number","Cum. risk**","Uncertainty interval","Crude Rate*","ASR (Wo
female.drop("C00-97/C44", axis=0, inplace=True)
female = female.rename(columns={'Cancer':'Cases','ICD': 'Type of Cancer'})

cancer.drop(["Number","Cum. risk**","Uncertainty interval","Crude Rate*","ASR (Wo
cancer.drop("C00-97/C44", axis=0, inplace=True)
cancer = cancer.rename(columns={'Cancer':'Cases','ICD': 'Cancer'})
```

Exploratory Data Analysis

The lists of the datasets that show the age group, gender group with the highest cancer and the leading cancer case were the fields of data examined to answer the following objectives:

1. To determine on what age group cancer is highest.
2. To identify what gender group cancer is highest.
3. To identify what cancer is prominent based in the Philippines.

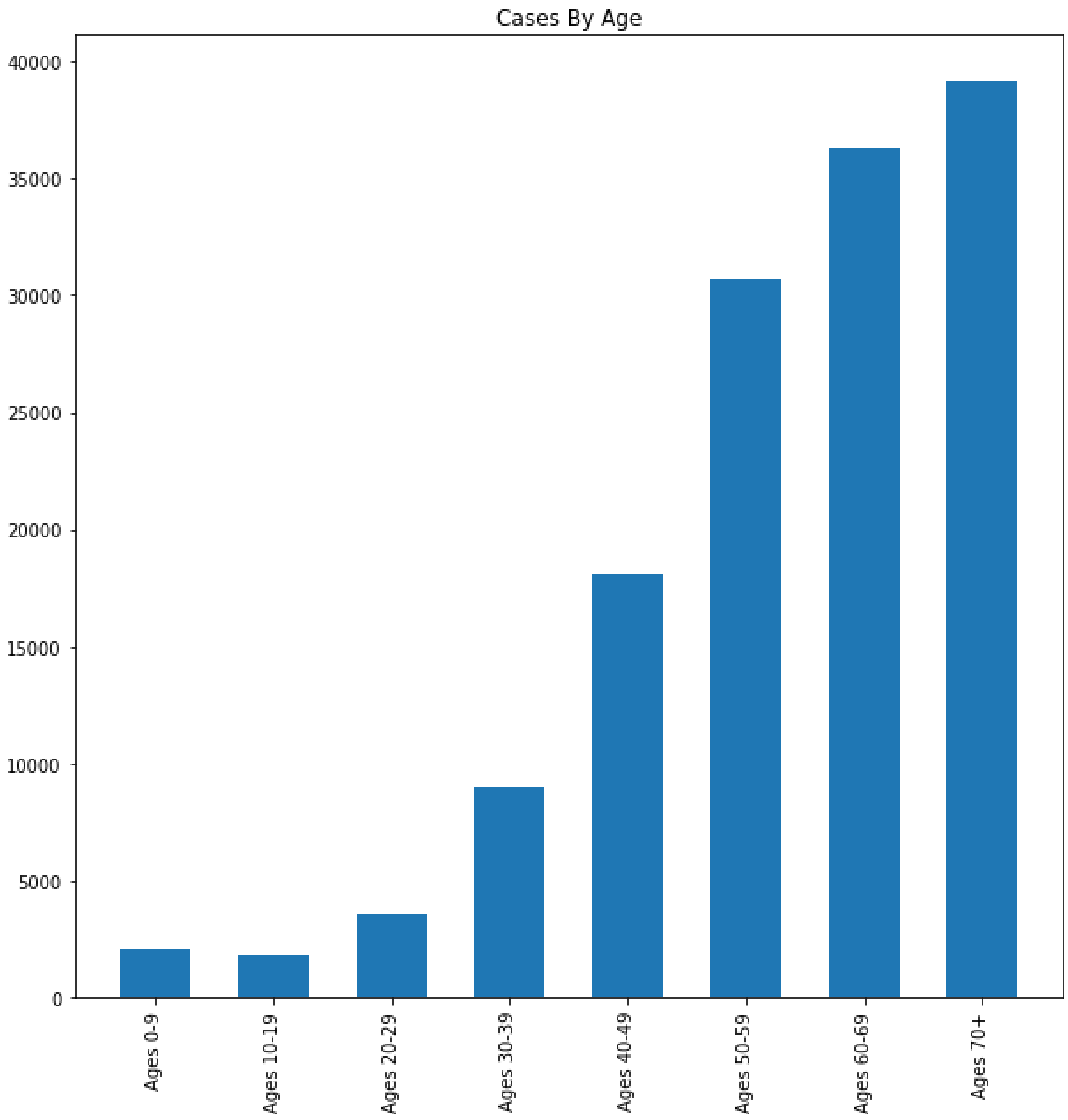
In [5]:
```
for x in range(len(li)):
    print(li[x])

#Lists all of the Datasets inside the list.
```

```
                         Type of Cancer  Cases
C91-95                        Leukaemia   1340
C70-72       Brain,centralnervoussystem    267
C82-86, C96         Non-Hodgkinlymphoma    150
C64-65                           Kidney    117
C22                               Liver     73
C62                              Testis     46
C56                               Ovary     16
C81                     Hodgkinlymphoma     16
C07-08                   Salivaryglands      8
C73                             Thyroid      5
C33-34                             Lung      4
C67                             Bladder      4
C51                               Vulva      4
C19-20                           Rectum      3
C54                          Corpusuteri      3
C43                       Melanomaofskin      3
C25                            Pancreas      2
C52                              Vagina      2
```

Age, gender, and cancer cases are then extracted from the cleansed data by separating them into different lists and histograms.

In [6]:
```
#Inputs the sum of cases for each age bracket into a dictionary.
age0_9 = li[0]["Cases"].sum(axis = 0, skipna = True)
age10_19 = li[1]["Cases"].sum(axis = 0, skipna = True)
age20_29 = li[2]["Cases"].sum(axis = 0, skipna = True)
age30_39 = li[3]["Cases"].sum(axis = 0, skipna = True)
age40_49 = li[4]["Cases"].sum(axis = 0, skipna = True)
age50_59 = li[5]["Cases"].sum(axis = 0, skipna = True)
age60_69 = li[6]["Cases"].sum(axis = 0, skipna = True)
age70_up = li[7]["Cases"].sum(axis = 0, skipna = True)

totalCases = {"Ages 0-9":age0_9, "Ages 10-19" : age10_19,
              "Ages 20-29":age20_29, "Ages 30-39":age30_39,
              "Ages 40-49":age40_49, "Ages 50-59" : age50_59,
              "Ages 60-69":age60_69, "Ages 70+":age70_up,
             }

#Plots the data using bars.
plt.rcParams["figure.figsize"]=(10,10)
plt.title("Cases By Age")
keys = totalCases.keys()
values = totalCases.values()
plt.bar(keys, values, width=0.6)
plt.xticks(rotation=90, horizontalalignment="center")
```

Out[6]:
```
([0, 1, 2, 3, 4, 5, 6, 7],
 [Text(0, 0, ''),
  Text(0, 0, ''),
  Text(0, 0, ''),
  Text(0, 0, ''),
  Text(0, 0, ''),
  Text(0, 0, ''),
  Text(0, 0, ''),
  Text(0, 0, '')])
```



```
In [7]: #Finds the highest number of cases of a specific age group in the dictionary.
        maxCases = max(totalCases.items(), key=operator.itemgetter(1))[0]
        print("The Age group that cancer is most prominent is those " + maxCases)
```

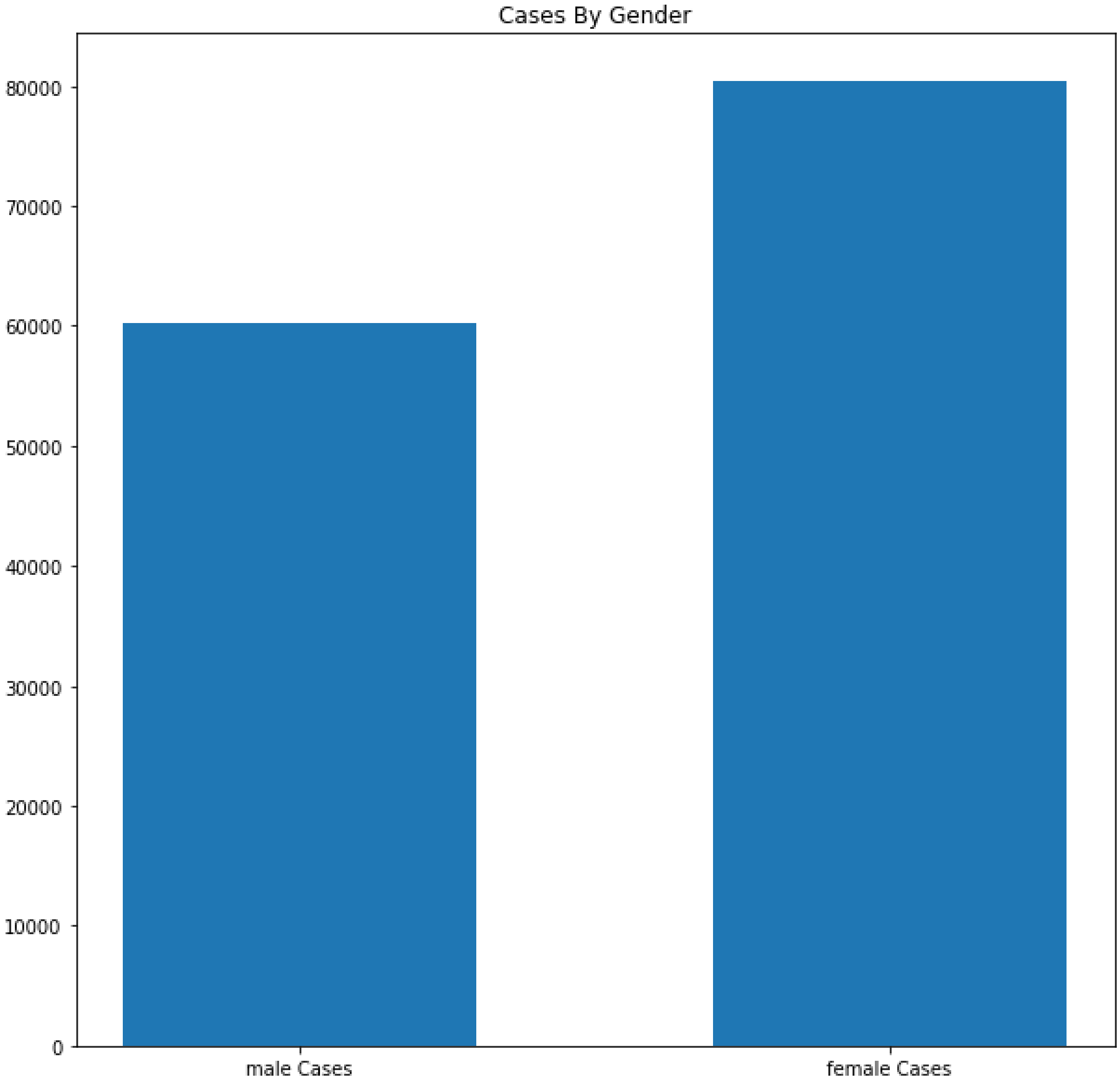
```
The Age group that cancer is most prominent is those Ages 70+
```

In [8]:

```
bothGenderCases = {"male Cases" : male["Cases"].sum(axis = 0, skipna = True),
                    "female Cases" : female["Cases"].sum(axis = 0, skipna = True)

plt.title("Cases By Gender")
keys1 = bothGenderCases.keys()
values1 = bothGenderCases.values()
plt.bar(keys1, values1, width=0.6)
```

Out[8]:

```
<BarContainer object of 2 artists>
```



In [9]:
```
maxGenderCases = max(bothGenderCases.items(), key=operator.itemgetter(1))[0]
print("The gender with the more prominent cancer cases is " + maxGenderCases)
```

```
The gender with the more prominent cancer cases is female Cases
```

In [10]:
```
cancer.head()
```

Out[10]:

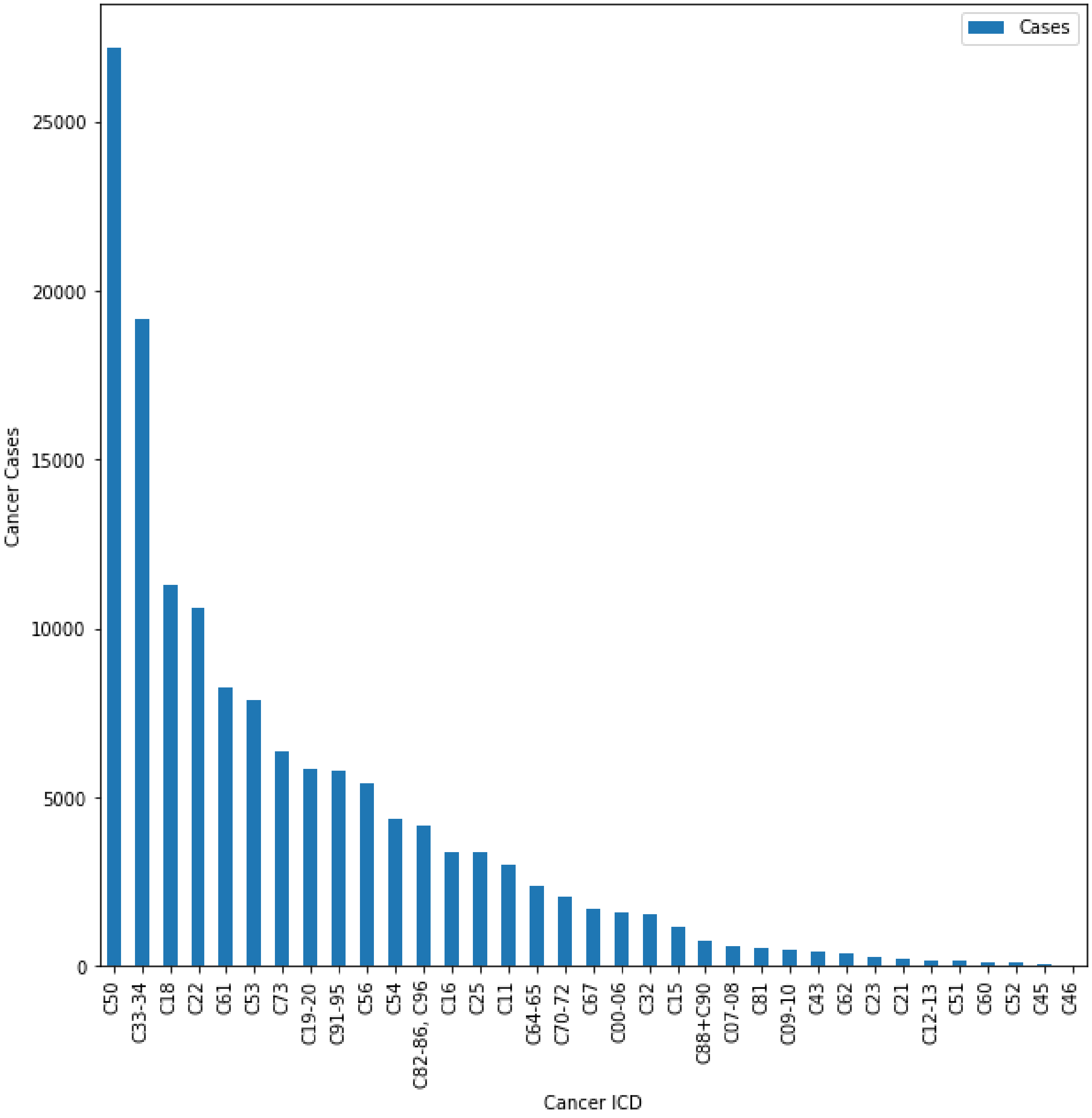
	Cancer	Cases
C50	Breast	27163
C33-34	Lung	19180
C18	Colon	11315
C22	Liver	10594
C61	Prostate	8242

In [11]:
```
#Finds the sum of all the cases of cancer.
allcases = { "CancerCases" :cancer ["Cases"].sum(axis = 0, skipna = True),}
print("The total cases of cancer in the Phillipines is ", allcases["CancerCases"]
```

```
The total cases of cancer in the Phillipines is  140639
```

In [12]:
```
#Plots the bar graph for the number of cases of cancer for each cancer.
cancer.plot.bar()
plt.xlabel("Cancer ICD")
plt.ylabel("Cancer Cases")
```

Out[12]:
```
Text(0, 0.5, 'Cancer Cases')
```



```
In [13]: highestCases = cancer['Cases'].max()
         print("The Highest cases of cancer in the Phillipines is ",cancer['Cancer'].iloc
```

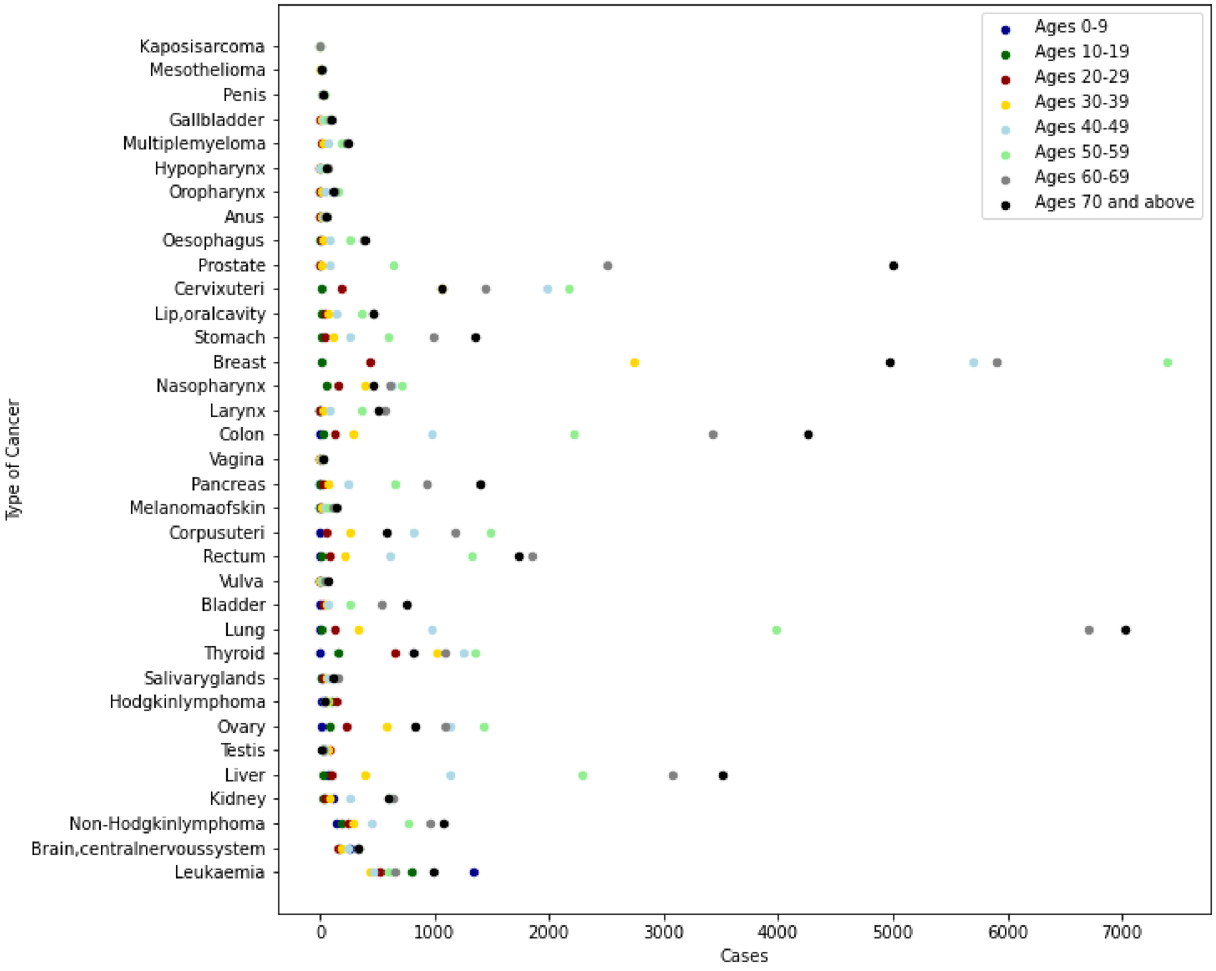
```
The Highest cases of cancer in the Phillipines is  Breast  Cancer with  27163 C
ases
```

Modelling

In this model, the scatter plot model assessed the data to determine the age group cancer with the highest cancer cases. Below is displayed the x-variable showing the number of cancer cases listed in the y-variable to point to the age group using different colored points.

In [14]:

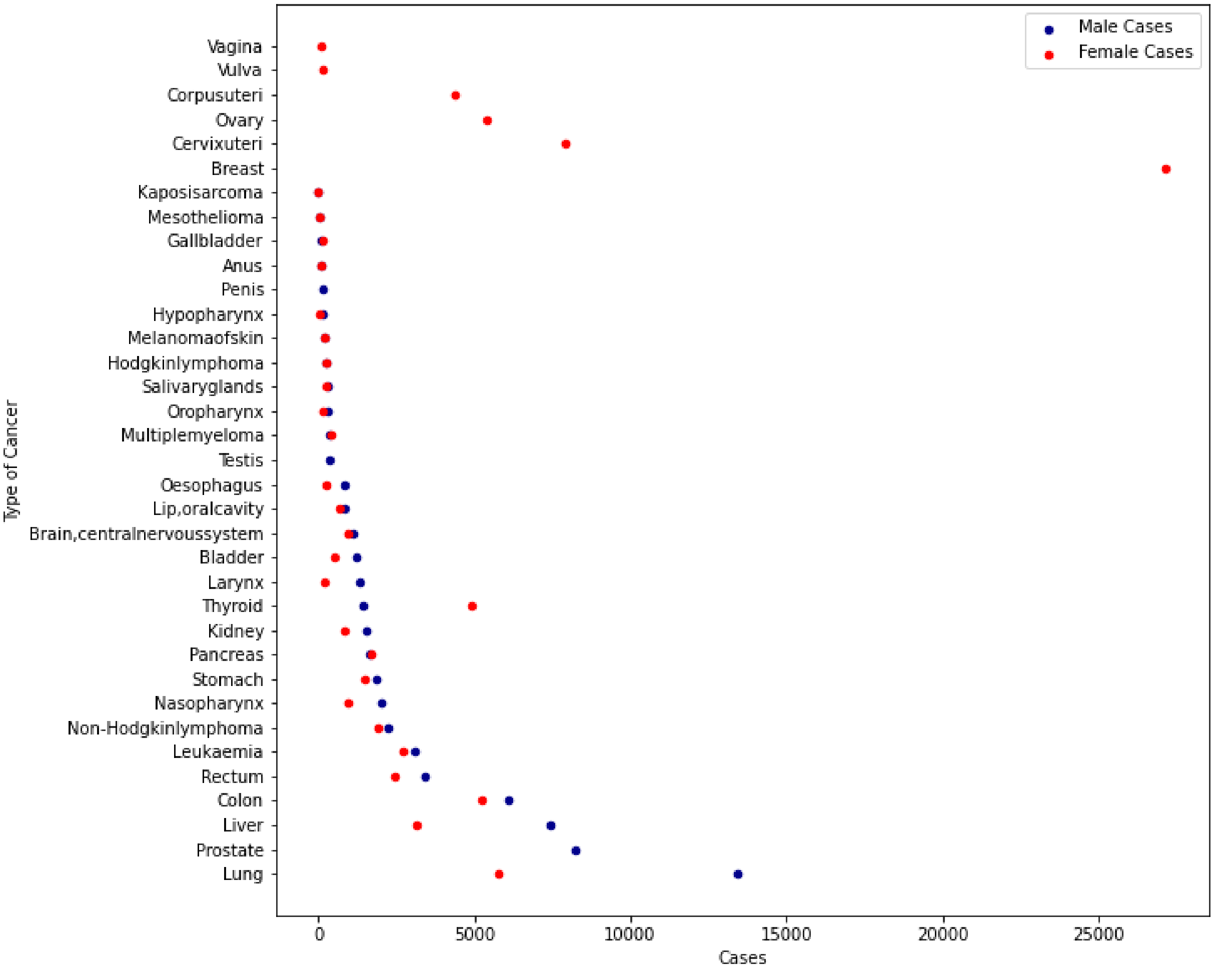
```
#Scatter plot model of the most prominent type of cancer based on age.

ax = li[0].plot(kind='scatter', x='Cases', y='Type of Cancer',
                color='DarkBlue', label='Ages 0-9');
li[1].plot(kind='scatter', x='Cases', y='Type of Cancer',
           color='DarkGreen', label='Ages 10-19', ax=ax);
li[2].plot(kind='scatter', x='Cases', y='Type of Cancer',
           color='DarkRed', label='Ages 20-29', ax=ax);
li[3].plot(kind='scatter', x='Cases', y='Type of Cancer',
           color='Gold', label='Ages 30-39', ax=ax);
li[4].plot(kind='scatter', x='Cases', y='Type of Cancer',
           color='LightBlue', label='Ages 40-49', ax=ax);
li[5].plot(kind='scatter', x='Cases', y='Type of Cancer',
           color='LightGreen', label='Ages 50-59', ax=ax);
li[6].plot(kind='scatter', x='Cases', y='Type of Cancer',
           color='Grey', label='Ages 60-69', ax=ax);
li[7].plot(kind='scatter', x='Cases', y='Type of Cancer',
           color='Black', label='Ages 70 and above', ax=ax);
```



In this model, the scatter plot model assessed the data to identify the gender group with the highest cancer cases. Below is displayed the x-variable showing the number of cancer cases listed in the y-variable to point to the gender group using different colored points.

In [15]:

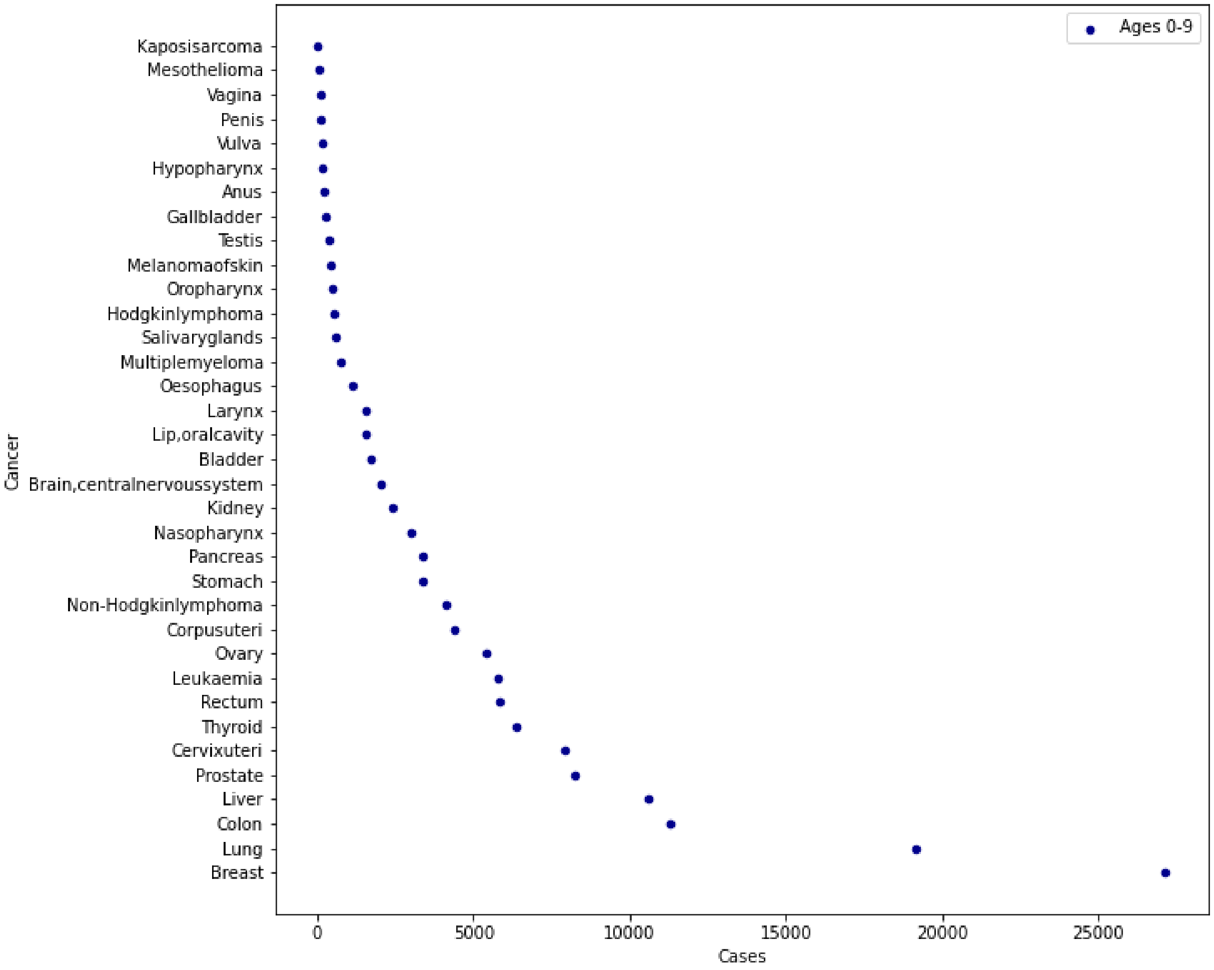
```
ax2 = male.plot(kind='scatter', x='Cases', y='Type of Cancer',
                color='DarkBlue', label='Male Cases');
female.plot(kind='scatter', x='Cases', y='Type of Cancer',
           color='Red', label='Female Cases', ax=ax2);
```



In this model, the scatter plot model assessed the data to identify the most prominent cancer case.

Below is displayed the x-variable showing the number of cancer cases listed in the y-variable to point to the leading cancer case using different colored points.

```
In [16]: cancer.plot(kind='scatter', x='Cases', y='Cancer',
                         color='DarkBlue', label='Ages 0-9');
```



Evaluation

Utilizing the model above, the age group with the highest cancer case, the gender group with the highest cancer case, and the most prominent cancer case were determined and identified through recalling the following functions below to present the results.

In [17]:

```
maxCases = max(totalCases.items(), key=operator.itemgetter(1))[0]
print("The age group that cancer is most prominent is those " + maxCases)

maxGenderCases = max(bothGenderCases.items(), key=operator.itemgetter(1))[0]
print("The gender with the more prominent cancer cases is " + maxGenderCases)

allcases = { "CancerCases" :cancer ["Cases"].sum(axis = 0, skipna = True),}
print("The total cancer cases in the phillipines is", allcases["CancerCases"])

highestCases = cancer['Cases'].max()
print("The highest cases of cancer in the Phillipines is ",cancer['Cancer'].iloc
```

```
The age group that cancer is most prominent is those Ages 70+
The gender with the more prominent cancer cases is female Cases
The total cancer cases in the phillipines is 140639
The highest cases of cancer in the Phillipines is  Breast  Cancer with  27163 C
ases
```

References

World Health Organization, International Agency for Research on Cancer (2020). Cancer today, Table. Retrieved from:

https://gco.iarc.fr/today/online-analysis-table?
v=2020&mode=cancer&mode_population=continents&population=900&populations=900&key=asr&s
(https://gco.iarc.fr/today/online-analysis-table?
v=2020&mode=cancer&mode_population=continents&population=900&populations=900&key=asr&s

In [ ]: