Import Pandas

In [5]:
```
import pandas as pd #import pandas
```

Read Dataset

In [6]:
```
df = pd.read_csv("Data/Task2/diabetes.csv") #read csv dataset to df
df.head() #project df
```

Out[6]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age	Outco
0	6	148	72	35	0	33.6	0.627	50	
1	1	85	66	29	0	26.6	0.351	31	
2	8	183	64	0	0	23.3	0.672	32	
3	1	89	66	23	94	28.1	0.167	21	
4	0	137	40	35	168	43.1	2.288	33	

Change 0 values of BloodPressure, SkinThickness and BMI to Null

In [7]:
```
df2 = df.copy() #copy df to save old one
df2['BloodPressure'].replace(to_replace = 0, value = 'Null', inplace = True)
#replacing 0 values in Bloodpressure with Null
df2['SkinThickness'].replace(to_replace = 0, value = 'Null', inplace = True)
#replacing 0 values in SkinThickness with Null
df2['BMI'].replace(to_replace = 0, value = 'Null', inplace = True) #replacing 0
values in BMI with Null
```

Remove Outcome column and one of the columns if correlation value with the other column > 0.5

In [8]:
```
df3 = df.copy() #copy df to save old one
df3 = df3.drop(columns = 'Outcome') #drop Outcome column

def removeColumn(df): #funtion to remove column if correlation value with other > 0.5
    for column in df.columns:
        for column2 in df.columns:
            if column != column2:
                corr = df[column].corr(df[column2])
                if corr > 0.5:
                    df = df.drop(columns = column)
    return df
```

In [9]:
```
removeColumn(df3) #run function on dataset
```

Out[9]:

	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age
0	148	72	35	0	33.6	0.627	50
1	85	66	29	0	26.6	0.351	31
2	183	64	0	0	23.3	0.672	32

	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age
3	89	66	23	94	28.1	0.167	21
4	137	40	35	168	43.1	2.288	33
...	...	...	...	...	...	...	...
763	101	76	48	180	32.9	0.171	63
764	122	70	27	0	36.8	0.340	27
765	121	72	23	112	26.2	0.245	30
766	126	60	0	0	30.1	0.349	47
767	93	70	31	0	30.4	0.315	23

768 rows × 7 columns

Projecting data on first and second PC's as a scatterplot

In [10]:
```
from sklearn.decomposition import PCA #import library
from sklearn.preprocessing import StandardScaler
```

In [11]:
```
# PCA is effected by scale so values have to be standardized
#features of dataset
features = ['Glucose', 'BloodPressure', 'SkinThickness', 'Insulin', 'BMI',
'DiabetesPedigreeFunction', 'Age']
#only features
x = df.loc[:, features].values
#only target
y = df.loc[:,['Outcome']]
# features standardixed
x = StandardScaler().fit_transform(x)
x
```

Out[11]:
```
array([[ 0.84832379,  0.14964075,  0.90726993, ...,  0.20401277,
         0.46849198,  1.4259954 ],
       [-1.12339636, -0.16054575,  0.53090156, ..., -0.68442195,
        -0.36506078, -0.19067191],
       [ 1.94372388, -0.26394125, -1.28821221, ..., -1.10325546,
         0.60439732, -0.10558415],
       ...,
       [ 0.00330087,  0.14964075,  0.15453319, ..., -0.73518964,
        -0.68519336, -0.27575966],
       [ 0.1597866 , -0.47073225, -1.28821221, ..., -0.24020459,
        -0.37110101,  1.17073215],
       [-0.8730192 ,  0.04624525,  0.65635768, ..., -0.20212881,
        -0.47378505, -0.87137393]])
```

In [12]:
```
pca = PCA(n_components = 2) #to project on first and second principal components
pcs = pca.fit_transform(x)
pcsDF = pd.DataFrame(data = pcs, columns = ['PC1', 'PC2'])
```

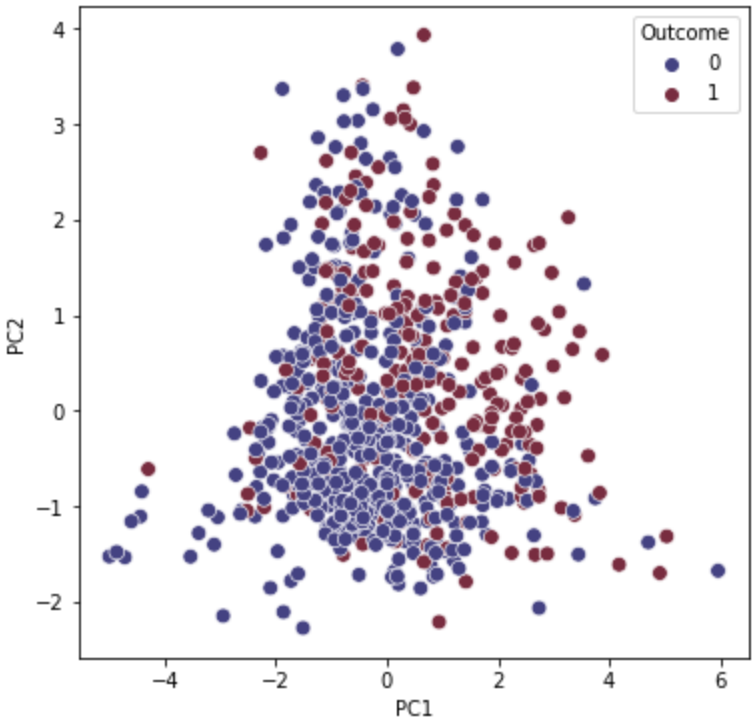
In [13]:
```
pcsDF = pd.concat([pcsDF , pd.DataFrame(y)] , axis = 1) #add target to df
```

```
import seaborn as sb #import library for visualization
import matplotlib.pyplot as plt #import library for plot
print(pcsDF)
plt.figure(figsize = (6,6))
sb.scatterplot(data = pcsDF , x = 'PC1',y = 'PC2' , hue = 'Outcome', s = 60 ,
palette= 'icefire')
```

```
          PC1       PC2  Outcome
0    0.879480  1.142083        1
1   -0.985500 -0.589810        0
2   -0.642791  1.204830        1
3   -0.914217 -1.151614        0
4    2.662910 -1.508009        1
..        ...       ...      ...
763  1.210706  0.915681        0
764  0.004620 -0.330199        0
765 -0.313074 -0.175631        0
766 -1.101898  1.461383        1
767 -0.653960 -0.972073        0

[768 rows x 3 columns]
```

Out[13]:
```
<AxesSubplot:xlabel='PC1', ylabel='PC2'>
```



In [ ]:
```
```