



**QUEEN'S  
UNIVERSITY  
BELFAST**

## DSA8002 COURSEWORK 1

Heart Disease Application

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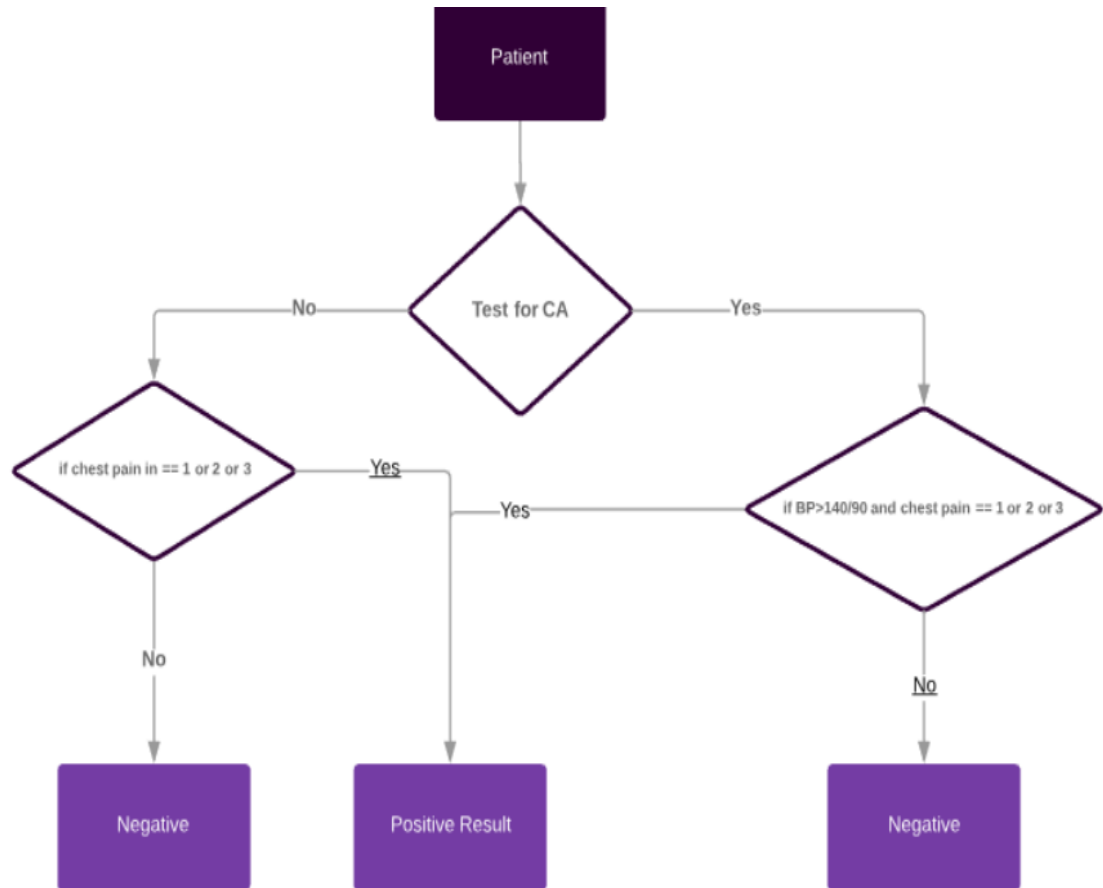
## 1. Introduction

There are several types of heart disease that tend to occur in humans based on certain type of heart condition. By considering the diagnostic test, carried out based on symptoms, about heart disease, a predication from the sample of population is elicited. There are different attributes from which are used to generate a diagnostic test for heart disease. Among which chest pain type and fasting blood sugar are commonly used in numeric test. This report is built by considering visualization and predictive modelling techniques used over the Cleveland heart disease dataset, to predict heart disease based from the sample of data that is collected from the UCI repository (given link below).

The link of the dataset is secured here: [Heart Disease](#)

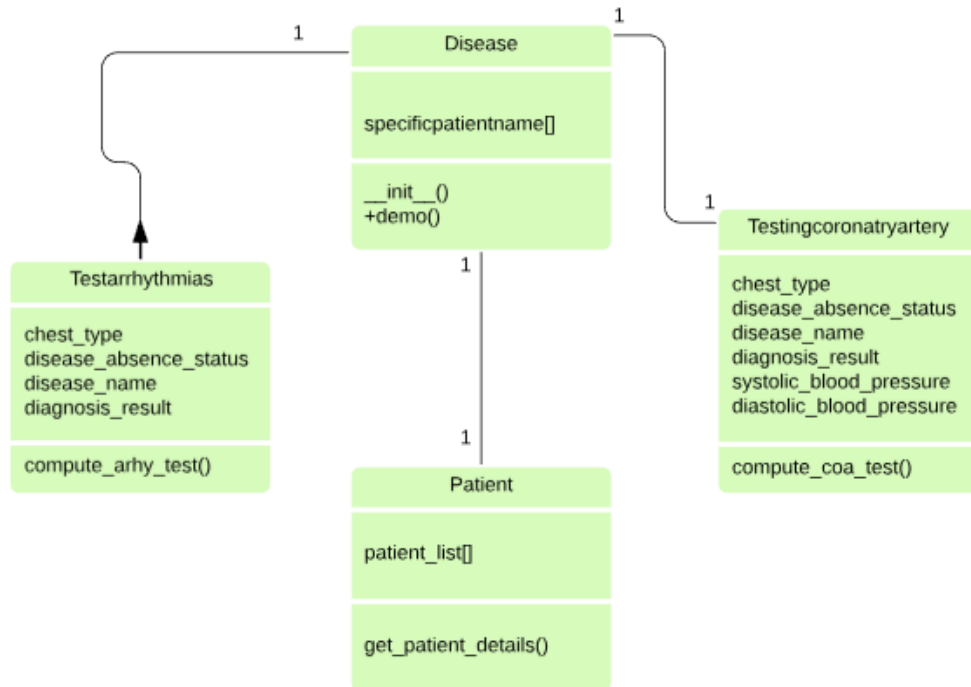
## 2. Flow Chart

Flow chart of the heart disease prediction application, which will result in negative based on certain condition and positive based on certain condition as test carried out.



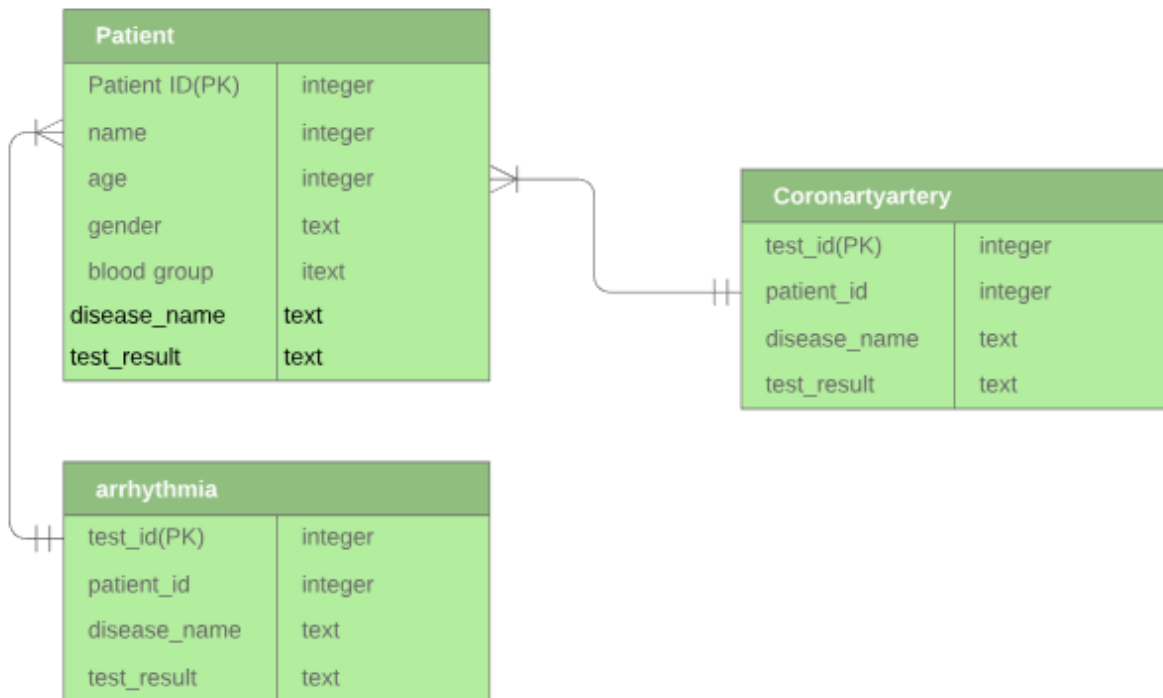
### 3. Class Design

Four classes are been implemented to determine the test results based on input provided.



## 4. ER Diagram

Database design furnished the sketch of the database been used with the help of SQLITE Browser for getting heart disease test results.



## 5. Testing Code

Class Testarrhythmias to check the Arrhythmias test for an individual.

**#Validation using test cases**

```
if __name__ == "__main__":
```

```
    arrhym = Testarrhythmias(1)
    arrhym.compute_arhy_test()
```

Class Testingcoronaryartery to check the Coronary Artery test for an individual

**#Validation using test cases**

```
if __name__ == "__main__":
```

```
    artery = Testingcoronaryartery(1)
    artery.compute_coa_test()
```

Class Patient to maintain the patients.

**#Validation using test cases**

```
if __name__ == "__main__":
```

```
    #Test Account class
```

```
    patient_list1 = [[1,'dhanush', 15, 'male', 'A+', 'arryh','negative'],
                     [2,'ramya', 30, 'female', 'A+', 'cad','positive']]
```

```
    patient_test_1 = Patient(patient_list1)
    patient_test_1.get_patient_details()
```

## 6. Code Snippet

1. Testarrhythmias class used to test the Arrhythmias for heart disease based on Chest Pain Type the patient possess in their heart.

```
def compute_arhy_test(self):
    try:
        chest_type = ['typical', 'atypical', 'non-anginal']
        disease_absence_status = 'negative'
        disease_name = 'Arrhythmia'
        diagnosis_result = 'positive'
        chest_pain = input('Enter the chest pain type(typical, atypical, non-anginal): \n')
        if chest_pain in chest_type:
            print("Test has determined patient with", diagnosis_result, disease_name)
            return disease_name, diagnosis_result
        else:
            print("Test has determined patient with", disease_absence_status, disease_name)
            return disease_name, disease_absence_status
    except:
        print("Error, please enter data accordingly.")
```

2. Testingcoronaryartery class used to test the Coronatry Artery for heart disease based on systolic blood pressure, diastolic blood pressure and Chest Pain Type the patient possess in their heart.

```
def compute_coa_test(self):
    try:
        chest_type = ['typical', 'atypical', 'non-anginal']
        disease_absence_status = 'negative'
        disease_name = 'Coronaty Artery Disease'
        diagnosis_result = 'positive'
        systolic_blood_pressure = int(input('\n Enter the systolic blood pressure: '))
        diastolic_blood_pressure = int(input('Enter the diastolic blood pressure: '))
        chest_pain = input('Enter the chest pain type(typical, atypical, non-anginal): \n')
        if chest_pain in chest_type and systolic_blood_pressure > 140 and
diastolic_blood_pressure > 90:
            print("Test has determined patient with", diagnosis_result, disease_name)
            return disease_name, diagnosis_result, True
        else:
            print("Test has determined patient with", disease_absence_status, disease_name)
            return disease_name, disease_absence_status, False
    except:
        print("Error, please enter data accordingly.")
```



## 7. Conclusion

By using statistic and built-in function, Heart Disease Prediction application is built to determine the test result based on particular testing approach used. The approach and technique have been further improvised to implement in professional fields. We can conclude that the individuals with chest pain type typical, atypical, non-anginal, systolic blood pressure more than  $> 120$  mm/dL and diastolic blood pressure  $> 90$  mm/dL are likely to result in presence of heart disease.