

1. Design

Title of the Design: Medicine Assistant

Overview: This application is developed for android OS.

Features: It provides user to find best hospitals for a specific disease treatment. It also provides brief overview of how much care it provides to patients.

Sources: The data is obtained from US Governments open data sources

Extensions: This application is being developed very much to have user access to data in very easy and understandable way. This can also be further improved to improve user experience.

- Data model (features)

For this application two data sources are downloaded.

Hospital_outcome_of_care_measurement:

This data set has more than 80 attributes providing information about morality and readmission details of Hospitals in USA. Sample data row is as follow:

*010001,SOUTHEAST ALABAMA MEDICAL CENTER,1108 ROSS CLARK
CIRCLE,,DOTHAN,AL,36301,HOUSTON,3347938701,15.0,No Different than U.S. National
Rate,12.7,17.5,669,,11.8,No Different than U.S. National Rate,9.9,14.2,751,,12.7,No Different
than U.S. National Rate,10,15.8,339,,17.9,No Different than U.S. National
Rate,15.8,20.5,747,,21.5,No Different than U.S. National Rate,19.2,24.1,898,,17.3,No Different
than U.S. National Rate,14.6,20.7,368,,No Different than U.S. National Rate,,393,5.3,4.0,7.1,No
Different than U.S. National Rate,,4686,14.8,13.3,16.5,No Different than U.S. National
Rate,,367,4.0,2.7,5.9*

For reducing the complexity this data set is refined and reduced to 12 attributes. This is done using python script- *hospital_index_refine.py*

Note: all scripts and data files are uploaded to midterm github directory.

After refining this data the sample data is:

*010001, SOUTHEAST ALABAMA MEDICAL CENTER,1108 ROSS CLARK
CIRCLE,,DOTHAN,AL,36301,HOUSTON ,15.0,11.8,12.7,17.9,21.5, No Different than U.S.
National Rate,17.3*

Second data set is

Inpatient_Pro prospective_Payment_System__IPPS__Provider_Summary_for_the_Top_100_Diagnosis-Related_Groups__DRG_:

This data set has 12 attributes which contains details about cost occurring for specific treatment.

Sample data row is as follows:

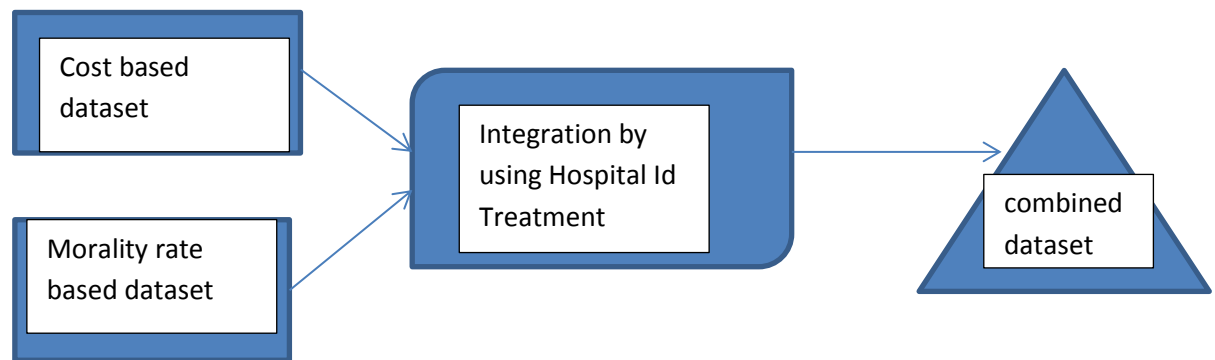
039 - EXTRACRANIAL PROCEDURES W/O CC/MCC,10001,SOUTHEAST ALABAMA
 MEDICAL CENTER,1108 ROSS CLARK CIRCLE,DOTHAN,AL,36301,AL -
 Dothan,91,"\$32,963.08 ",5777.24

This data set is refined using script – *hospital_cost_refine.py*. After refining the data can row is as follows: It contains hospital ID ,treatment and its cost estimated.

039 - EXTRACRANIAL PROCEDURES W/O CC/MCC,10001,5777.24

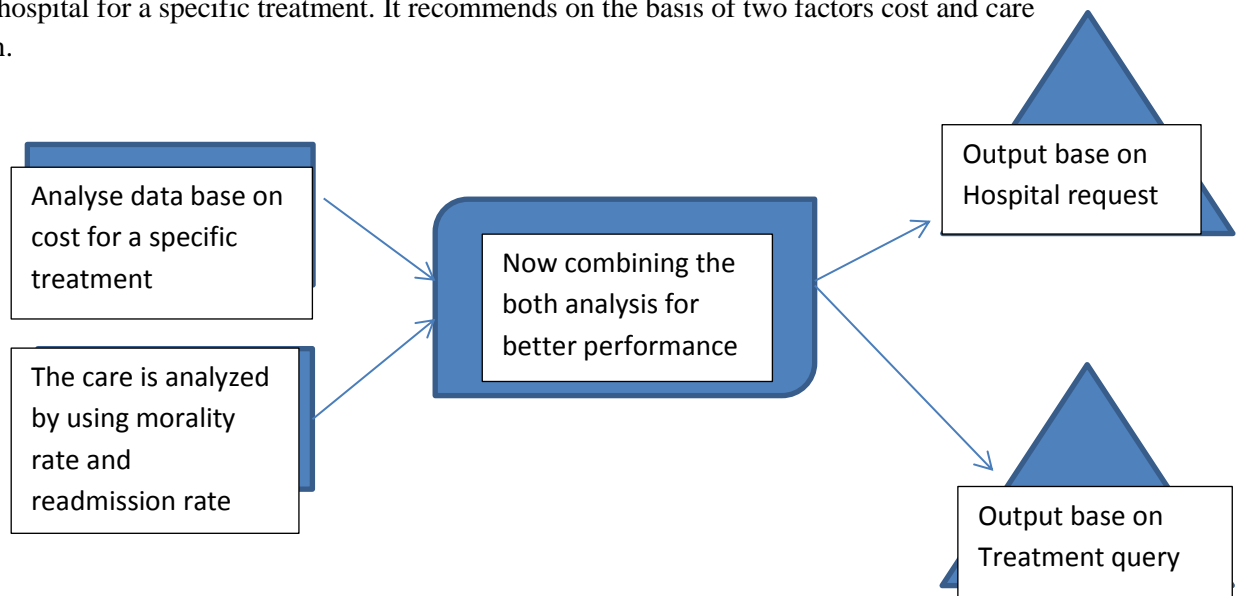
- Integration model and algorithm

After refining the two data sets integration is achieved by using two attributes. They are hospital ID and hospital name. By using these two attributes integration of cost and hospital index is achieved.



- Predictive/recommendation model and algorithm

In this design the recommendation is achieved more than prediction. This dataset recommends the best hospital for a specific treatment. It recommends on the basis of two factors cost and care taken.



- Mobile App/Web design

Finally to have user interface Android application using eclipse IDE is developed with graphical interface for data. Eclipse provides a user friendly interface to design application with avoiding bugs easily.

2. Features Implemented

- Integration algorithms

The data integration algorithm is used extract data with specific attributes. The algorithm is achieved using python script – *hospital_id_extract.py*, *treatment_extract.py*

- Recommendation algorithms

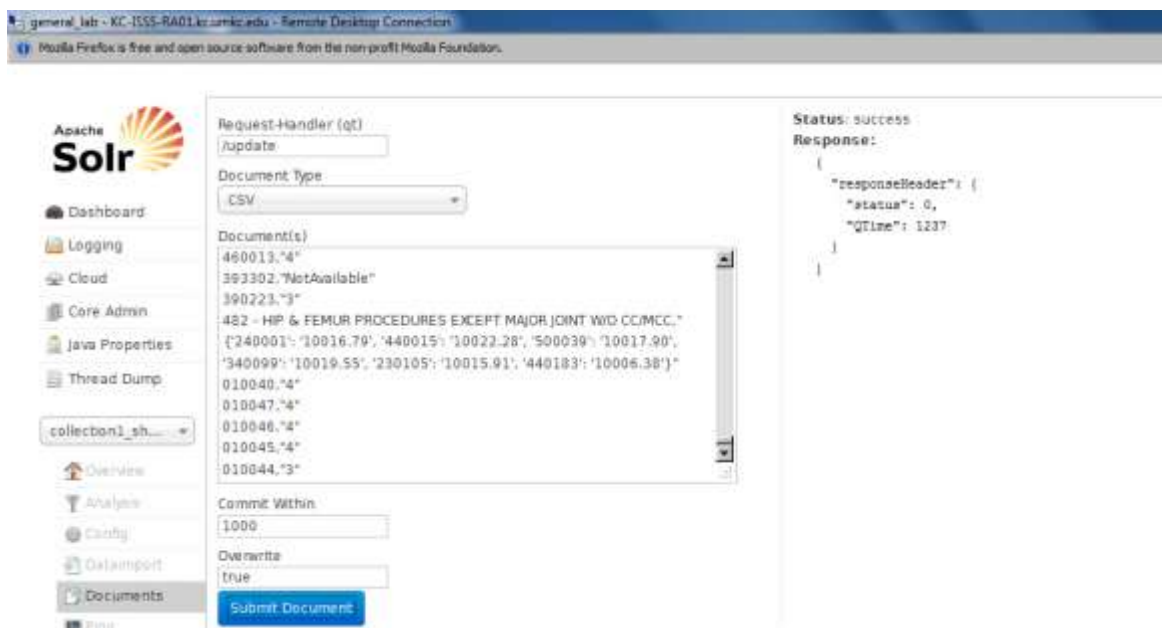
Recommendation is achieved by using compare and modify algorithm. This algorithm will compare all the data available and extraction the few sets depending on conditions. In this design the extraction and analysis is done by using - *hospital_cost_find_top5.py*

This model provides the output in csv format to store it easily to cloud.

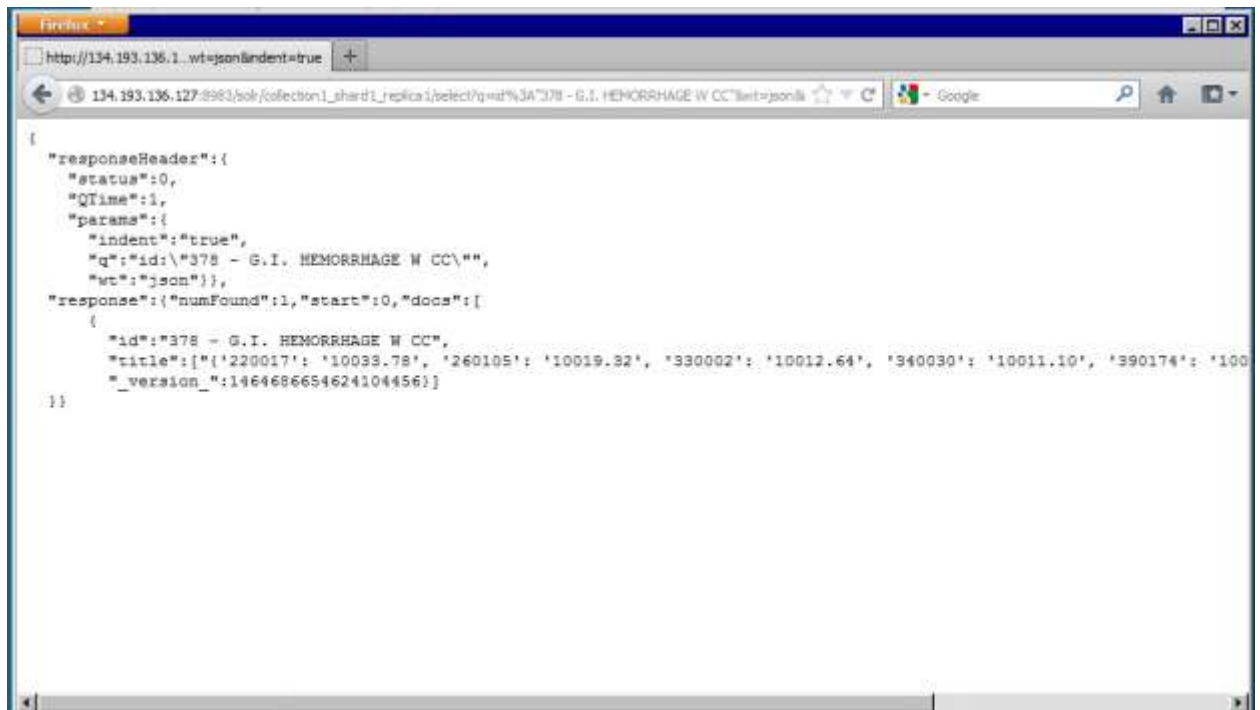
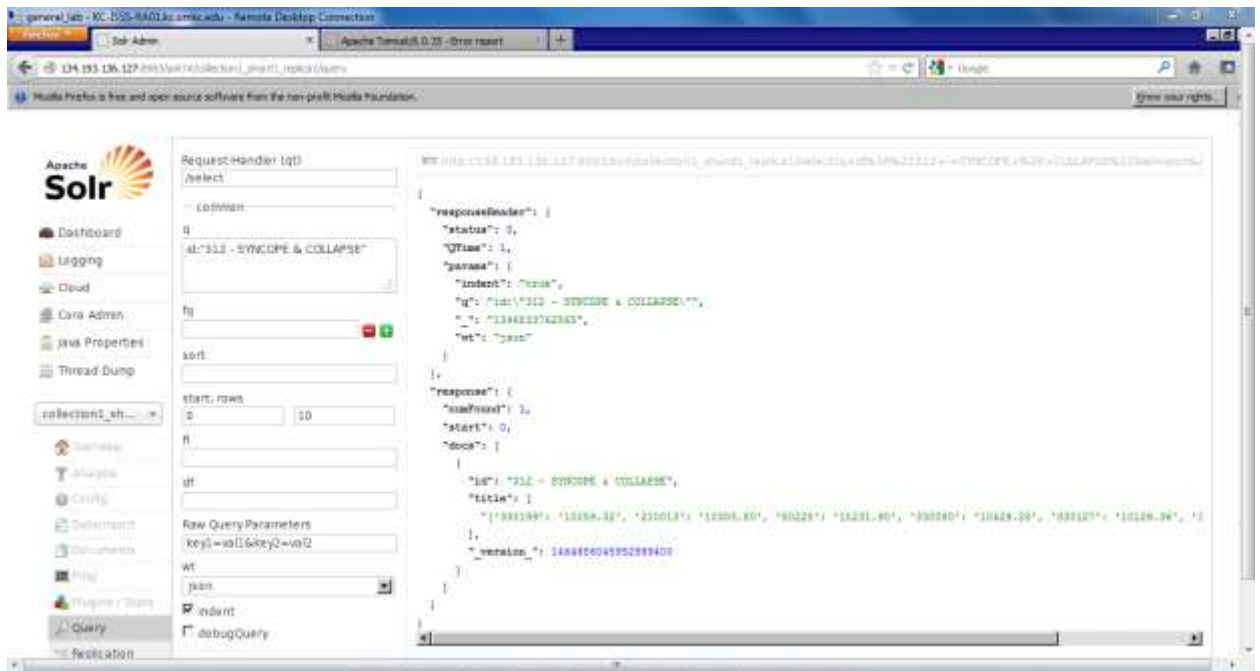
- Solr indexing: Your own data services

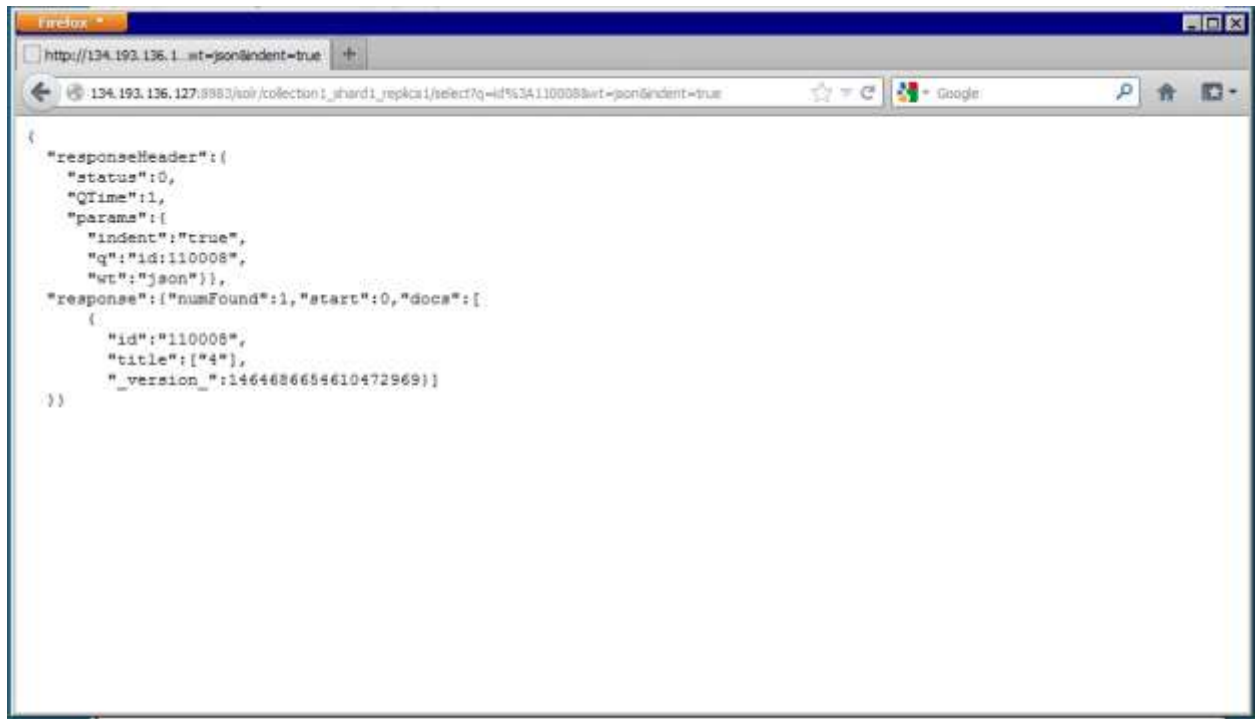
Finally the data obtained is sent to solr using solr user interface. This uploaded to solar in csv format. The final data is in file – *final.csv*

Steps can be seen as follows: The data in solr is submitted using HTTP update in csv format



To test whether data is uploaded correctly or not

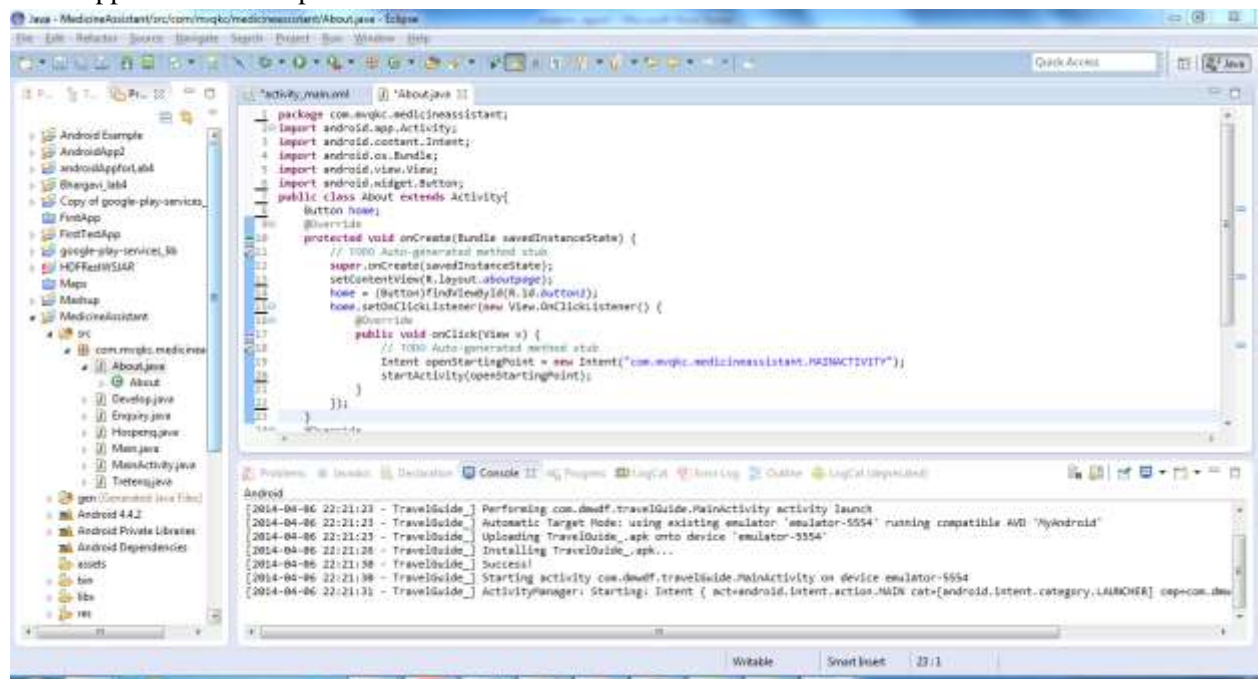




- Mobile User Interface

Android application using eclipse is developed. This application is given permission such as internet to have access to post and get data using http methods. The data is then obtained from solr in json format upon sent request. The json data is parsed to strings and provide as outputs

Basic application development interface is as below:



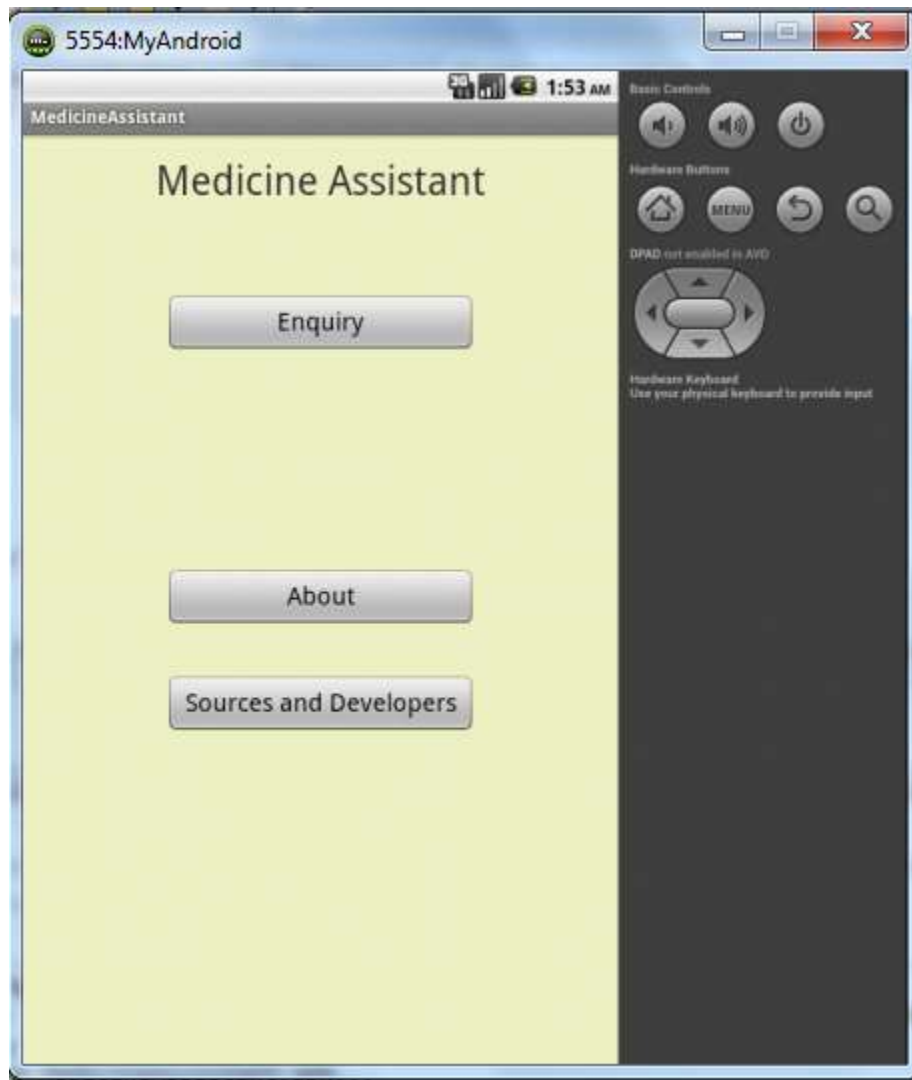
The application has 6 activities for which 6 classes and 6 layout files are designed. All these files are uploaded to github url.

3. Outputs: description with screenshots of the Features

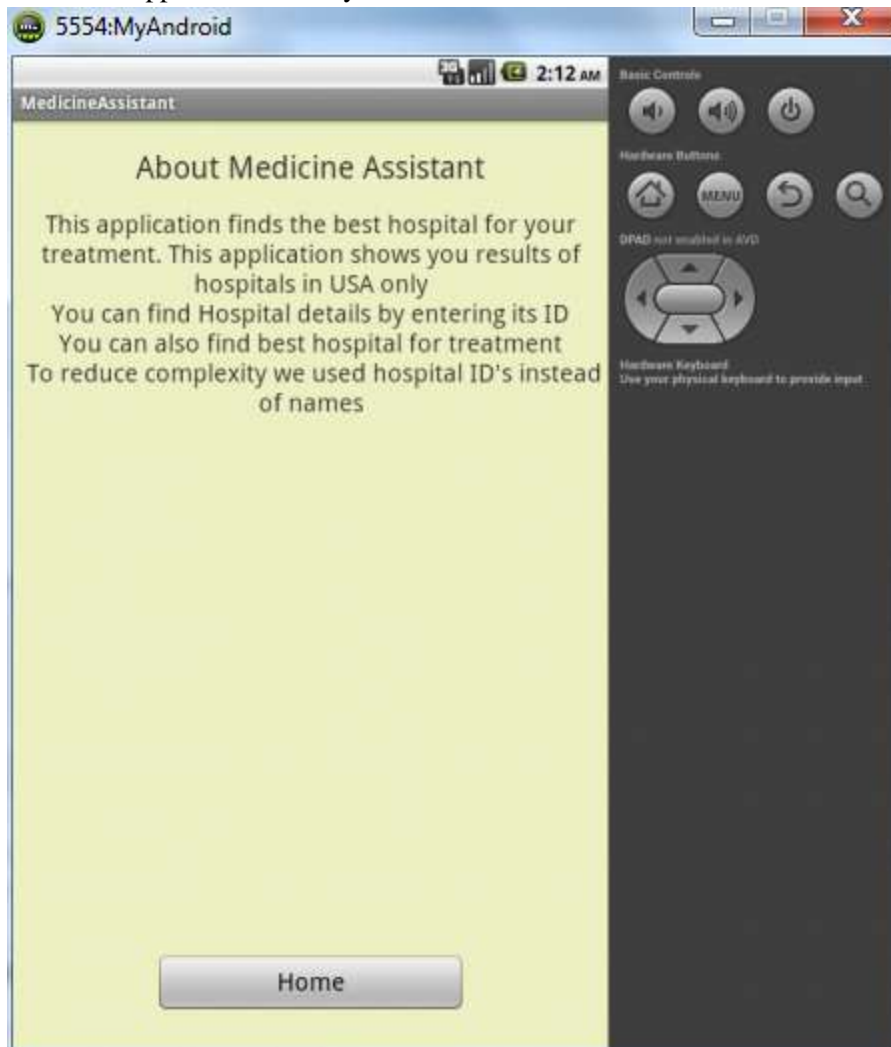
Application output is tested using android avd with version 2.2 froyo in it.

Different activities with graphical layouts are as follows:

First layout when application is opened looks as below. Here we can choose any of three option shown below



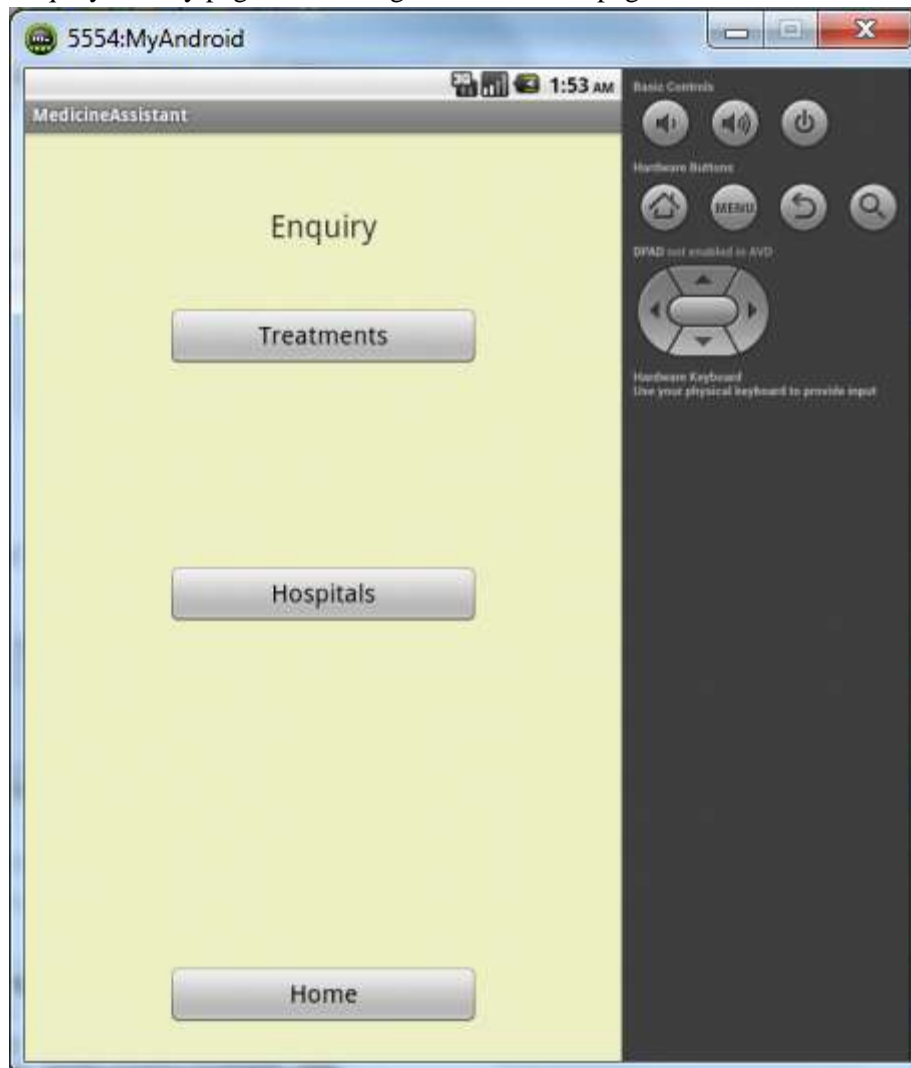
The about application activity screen



Source and Developers activity page is as below:



Enquiry activity page when navigated from home page:



Hospital care index enquiry page before enquiry:



Hospital care index enquiry page after enquiry:



Here the input is hospital ID. The list of hospital and its ID are provided in a file and uploaded to github directory. The output is index based on care taken

1 - very extensive care taken

:

:

:

5 - Regular care taken

List of hospital for treatment enquiry page before enquiry:



List of hospital for treatment enquiry page After enquiry:



Here the input is treatment name. The list of treatments in this data available are provided in a file and uploaded to git hub. The output will be the top 6 best hospital ID's and estimated cost for the treatment.

4. Your midterm Github URL

<https://github.com/Mahesh-Vemula/KDM/tree/master/Midterm>

5. Limitations

This application has many limitations. As due to less span of time it is not designed up on expected performance. Few limitations easily noticeable are we cannot use query using hospital name.

Anyhow this application can be further improve with high performance, scalability and user friendly.

6. References

<http://www.data.gov/>

<http://developer.android.com/index.html>

<https://www.python.org/>

<https://lucene.apache.org/solr/>

<http://stackoverflow.com/>

<https://www.google.co.in/>