Personal Budget Planner

Submitted in partial fulfillment of the requirements

of the degree of

Bachelor of Engineering

by

Gaurav Ambavle - 04
Rohit Chavan - 10
Parth Dubal - 16
Omkar Patil - 47

Supervisor:

Asst. Prof. Aruna Khubalkar

Department of Information Technology

Don Bosco Institute of Technology

2017-2018

AFFILIATED TO

UNIVERSITY OF MUMBAI

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CERTIFICATE

This is to certify that the project entitled **"Personal Budget Planner "** is a bonafide work of

Gaurav Ambavle	**04**
Rohit Chavan	**10**
Parth Dubal	**16**
Omkar Patil	**47**

submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **Undergraduate** in **Bachelor of Information Technology**

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Project Report Approval for B.E.

This project report entitled **"Personal Budget Planner "** by **Gaurav Ambavle, Rohit Chavan, Parth Dubal, Omkar Patil** is approved for the degree of **Bachelor of Engineering in Information Technology**

(Examiner's Name and Signature)

1. ——————————————

2. ——————————————

(Supervisor's Name and Signature)

1. ——————————————

(Chairman)

1. ——————————————

Date:

Place:

DON BOSCO INSTITUTE OF TECHNOLOGY
Vidyavihar Station Road, Mumbai - 400070

Department of Information Technology

Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea / data / fact / source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Gaurav Ambavle

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Omkar Patil

Date:

Abstract

Budget planning is very important factor to maintain expense within the income limit and manage the daily expenses accordingly. As nowadays smart phones are easily accessible to many people, so using a smart phone app they can conveniently look over their expenses, income and budget at the reach of their fingertips. In traditional systems one has to note down their expenses in a catalogue, ledger, diary or handbook, but nowadays people don't have time to note down their expenses in a book. The applications that are currently available on play store basically focuses on creating the graphical representation of user's expenditures, maintains log of daily expenses and export data that have been entered in the application.

In this project, we are creating an android application "Personal budget planner "which can be used by the people to maintain and manage their budget easily. It will analyze the daily expenditure and provide you the predictions for the current month. Also the user will get alerts and reminders to be aware about his monthly budget. In this application we are using time series analysis algorithm for prediction purpose as they are very useful models when we have serially correlated data. Time Series Analysis, as the name suggests, involves working on time (years, days, hours, minutes) based data, to derive hidden insights to make informed decision making.
Keywords: Budget planner, prediction, Time Series Analysis

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Chapter 1

Introduction

1.1 Problem Statement

To develop an android application designed to organize your budget and expenses by predicting your monthly expenditure.

1.2 Scope of the Project

The scope of the project is to make an android application which can be used by people to manage their daily expenses. As nowadays smart phones are easily accessible to many people, so using a smart phone they can conveniently look over their expenses, income and budget at the reach of their fingertips. The traditional system used had to note down their expenses in a catalogue, ledger, diary or handbook but nowadays people don't have time to note down their expenses in a book. So, the proposed system is designed to lower the pains taken by people to manage their expenses and budget. The proposed system gives you a detailed record of your daily expenses, how much you are free to spend? , how much you are left with?, it also gives a detailed analysis of your daily spend cycle, your monthly and annually expense graph which will help you to understand your expenses.

1.3 Current Scenario

The applications that are currently available on playstore is basically focuses on creating the graphical representation of user's expenditures, maintains log of daily expenses and export data that you have entered in the application. Some application also provides you the facility of payment of your bills and recharge All the features are not available in one application each contains some pros and cons.

1.4 Need for the Proposed System

Personal Budget Planner is an application which provides the prediction of budget of the user. User faces difficulties maintaining expenditure is start spending too much money at the start of the month but user do not know how much money he/she is going to have at the end of the month so that is why we have added prediction feature which will give you the approximately value of how much money you are going to spend in this month based on your current data. Also user will get alerts and reminders to be aware about his monthly budget.

1.5 Summary of the results and task completed

- Algorithm
  Time Series Analysis algorithm It is an uni variate algorithm which consists of models: AR(Auto Regressive), MA(Moving Average), ARMA(Auto Regressive Moving Average), ARIMA(Auto Regressive Integration Moving Average) which are used for predicting next approximate expense. Regression We have studied Regression and its types(Simple Linear, Multi Linear, Polynomial). implementation of ARIMA model is being done in python

- User interface of application using android studio is successfully completed.

- For database connectivity we have used SQL lite and to perform different operations of this application we have used java in android studio

Chapter 2

Review of Literature

2.1 Summary of the investigation in the published papers

Time Series Analysis of Household Electric Consumption with ARIMA and ARMA Models

The purposes of this research are to find a model to forecast the electricity consumption in a household and to find the most suitable forecasting period whether it should be in daily, weekly, monthly, or quarterly. The time series data in our study was individual household electric power consumption from December 2006 to November 2010. The data analysis has been performed with the ARIMA (Autoregressive Integrated Moving Average) and ARMA (Autoregressive Moving Average) models. The suitable forecasting methods and the most suitable forecasting period were chosen by considering the smallest value of AIC (Akaike Information Criterion) and RMSE (Root Mean Square Error), respectively.

2.2 Comparison between the tools / methods / algorithms

Features	Daily Expense-3	My Budget Book	Andro money	Money View	Proposed System
Expense Log	Yes	Yes	Yes	Yes	Yes
Monthly Analysis	Yes	Yes	Yes	Yes	Yes
Cloud Storage	No	No	Yes	No	No
User Account Support	Yes	Yes	Yes	Yes	Yes
Alerts and Reminders	Yes	Yes	No	Yes	Yes
Expense Prediction	No	No	No	No	Yes
Free	No	No	No	No	Yes

Table 2.1: Comparison Table

2.3 Algorithms

TIME SERIES ANALYSIS

Why Time series? Time Series Modeling. As the name suggests, it involves working on time (years, days, hours, minutes) based data, to derive hidden insights to make informed decision making. Time series models are very useful models when you Department of Information Technology, DBIT, Mumbai 4 LIST OF TABLES have serially correlated data. Most of business houses work on time series data to analyze sales number for the next year, website traffic, competition position and much more.

STEPS TO PERFORM TIME SERIES ANALYSIS

Step 1: Visualize the Time Series

It is essential to analyze the trends prior to building any kind of time series model. The details we are interested in pertains to any kind of trend, seasonality or random behaviour in the series. We have covered this part in the second part of this series.

Step 2: Stationarize the Series

Once we know the patterns, trends, cycles and seasonality , we can check if the series is stationary or not. Dickey – Fuller is one of the popular test to check the same. We have covered this test in the first part of this article series. This doesn't ends here! What if the series is found to be non-stationary? There are three commonly used technique to make a time series stationary: 1. Detrending : Here, we simply remove the trend component from the time series. For

instance, the equation of my time series is: x(t) = (mean + trend * t) + error We'll simply remove the part in the parentheses and build model for the rest. 2. Differencing : This is the commonly used technique to remove non-stationarity. Here we try to model the differences of the terms and not the actual term. For instance, x(t) – x(t-1) = ARMA (p , q) This differencing is called as the Integration part in AR(I)MA. Now, we have three parameters p : AR d : I q : MA 3. Seasonality : Seasonality can easily be incorporated in the ARIMA model directly. More on this has been discussed in the applications part below.

Step 3: Find Optimal Parameters

The parameters p,d,q can be found using ACF and PACF plots. An addition to this approach is can be, if both ACF and PACF decreases gradually, it indicates Department of Information Technology, DBIT, Mumbai 5 LIST OF TABLES that we need to make the time series stationary and introduce a value to "d".

Step 4: Build ARIMA Model

With the parameters in hand, we can now try to build ARIMA model. The value found in the previous section might be an approximate estimate and we need to explore more (p,d,q) combinations. The one with the lowest BIC and AIC should be our choice. We can also try some models with a seasonal component. Just in case, we notice any seasonality in ACF/PACF plots.

Step 5: Make Predictions

Once we have the final ARIMA model, we are now ready to make predictions on the future time points. We can also visualize the trends to cross validate if the model works fine. Stationary Series There are three basic criterion for a series to be classified as stationary series : 1. The mean of the series should not be a function of time rather should be a constant.. 2. The variance of the series should not a be a function of time. This property is known as homoscedasticity. 3. The covariance of the i th term and the (i + m) th term should not be a function of time. Why do I care about 'stationarity' of a time series? In cases where the stationary criterion are violated, the first requisite becomes to stationarize the time series and then try stochastic models to predict this time series. There are multiple ways of bringing this stationarity. Some of them are Detrending, Differencing etc.

Chapter 3

Analysis and Design

3.1 Methodology / Procedure adopted

Spiral model is a combination of sequential and prototype model. This model is best used for large projects which involves continuous enhancements. There are specific activities which are done in one iteration (spiral) where the output is a small prototype of the large software. The same activities are then repeated for all the spirals till the entire software is build.
we have a whatsapp group of all the members in the project and the project guide ,in which we share any data. As it is free of cost and easy way of communication. and we have regular weekly meetings on every Wednesday with our project guide and project coordinator
We try to work in distributed manner i.e. the project guide distributes the topic among members to study and research .After one week we have meeting of all members with project guide , in which we discuss about the topics we studied and solved any problems if anyone had.

Work Breakdown Structure

1. Personal Budget Planner

1.1 Initiation

1.1.1 Examine the existing Applications

1.1.2 Evaluation Recommendations
1.1.3 Determining the Problem Statement
1.1.4 Literature Survey
1.2 Planning
1.2.1 Create Scope Statement
1.2.2 Determine Objective of the project
1.2.3 Determine Project Team
1.2.4 Determining the Features of the Application
1.2.5 Determining Algorithm for the prediction
1.2.6 Develop Project Plan
1.3 Design
1.3.1 Designing Homepage
1.3.2 Designing User Login Module
1.3.3 Designing Transaction Module
1.3.4 Designing Analysis Module
1.3.5 Designing Bill Module
1.3.6 Designing Budget Prediction Module
1.4 Execution
1.4.1 Project Kickoff Meeting
1.4.2 Verify Validate Features of the application
1.4.3 Design the prototype of User Interface
1.4.4 Implementing the Algorithm
1.4.5 Implementing the Dataset
1.5 Testing
1.5.1 Testing of User Interface
1.5.2 Testing of Algorithm
1.5.3 Testing of Dataset
1.5.4 System Testing

3.2 Analysis

This being an application the developed product will be helpful to the users to efficiently track and manage their expenses. User can get the insights of their expenses by the analysis provided based on user data. The requirements and specifications are clearly understood and will provide appropriate prediction value to get and idea of forecasted user expenses.

3.2.1 Software / System Requirement Specification

PERSONAL BUDGET PLANNER

1. Introduction

Personal Budget Planner is an application is designed to organize your income and expenses by predicting your monthly expenditure. As nowadays smart phones are easily accessible to many people, so using a smart phone they can conveniently look over their expenses, income and budget at the reach of their fingertips. The traditional system used had to note down their expenses in a catalogue, ledger, diary or handbook but nowadays people don't have time to note down their expenses in a book. So, the proposed system is designed to lower the pains taken by people to manage their expenses and budget. The proposed system gives you a detailed record of your daily expenses, how much you are free to spend? , how much you are left with?, it also gives a detailed analysis of your daily spend cycle, your monthly and annually expense graph which will help you to understand your expenses.

1.1 Product Overview

To Develop a Personal Budget Planner that consists of the following:
1.To help user to manage expenses by providing graphical analysis.
2.The user can track and control their expenses according to their budget.
3.Expense Prediction based on user expense data.

2. Specific Requirement

2.1 External Interface Requirement
2.1.1 User Interface
1. Add Income Source: User will add sources of his Income(E.g Salary).
2. Add Expense: User will add the details and amount of expenses.
3. Analysis: User can see expenses record for a specific
interval(E.g week,month,quarterly).
4. Set Reminders: It will alert users for specific events or any bill due to be paid.
2.1.2 Hardware Interfaces
The system will be developed on Microsoft® Windows® 8/7/Vista/2003 (32 or 64-bit), 2GB RAM minimum, 4GB RAM recommended, 400 MB hard disk space + at least 1 G for Android SDK, 1280*800 minimum screen resolution.

2.1.3 Software Interfaces

Operating System: Linux, MAC, Windows.
Development Tools: Android Studio, Java Development Kit(JDK) 1.7
Database: SQLite.

2.2 Software System Attributes

2.2.1 Reliability

The system has to be reliable because user will interact with the system multiple systems and consists of important user data.

2.2.2 Availability

The system must be available to user 24*7 by maintaining the integrity of user data

2.2.3 Security

The system contains of valid Authentication support which will allow only authenticated user to access his/her data. User can export the data so that he can manually secure data. The application is scanned by Google Play Protect.

2.2.4 Maintainability

The system will be checked periodically for bugs and issues, user can report any bugs and issues which will be solved by the maintenance team.

2.2.5 Portability

The application currently supports Android platform, though user can export the data into industry standard format(.csv or .xslx). 2.3 Database Requirements
SQLite database is required to store user expense data.

3. Block Diagram

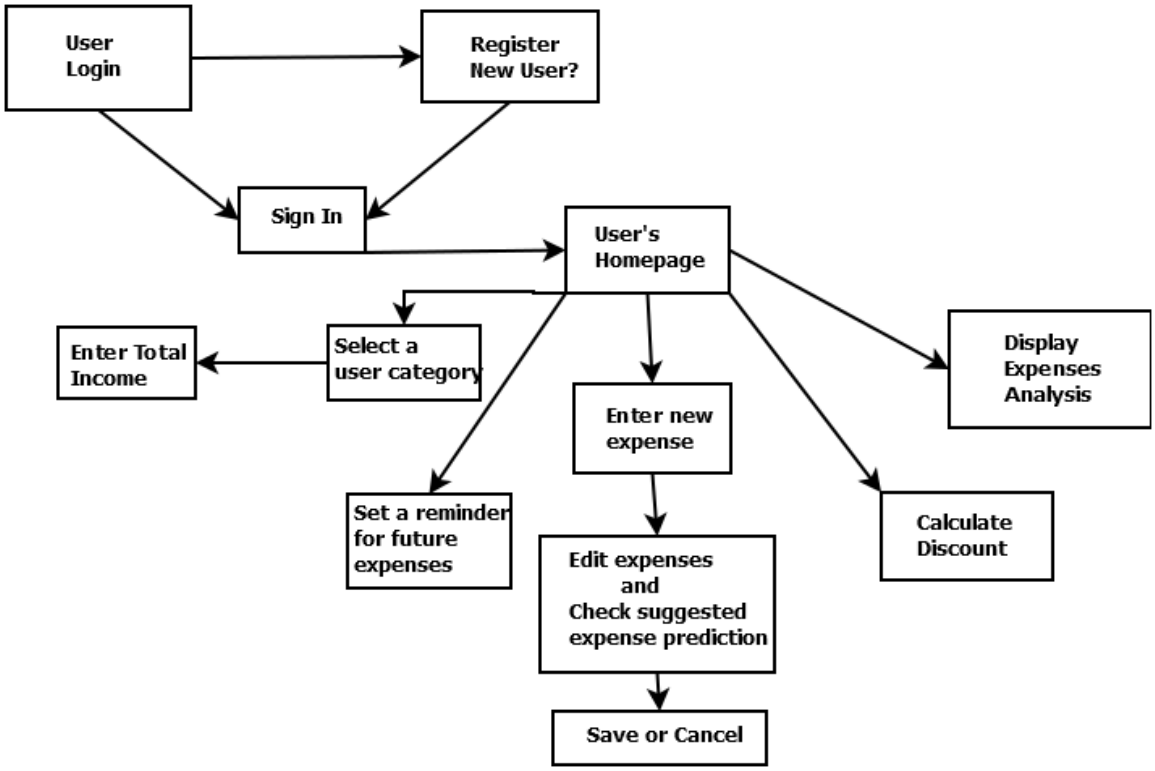


Figure 3.1: Block Diagram

3.3 Proposed System

Personal Budget Planner is an Android Application it runs on the Android Operating System .The Database required to store and perform operations in data is based on SQLite database.

3.3.1 Hardware / Software requirements

3.3.1 Hardware/Software requirements
Hardware
Microsoft® Windows® 8/7/Vista/2003 (32 or 64-bit).
2 GB RAM minimum, 4 GB RAM recommended.
400 MB hard disk space + at least 1 G for Android SDK.
Software
Front End: Android Studio,Java Development Kit (JDK) 7.
Backend: SQLite.

3.4 System Architecture / Design

3.4.1 Modules and their description

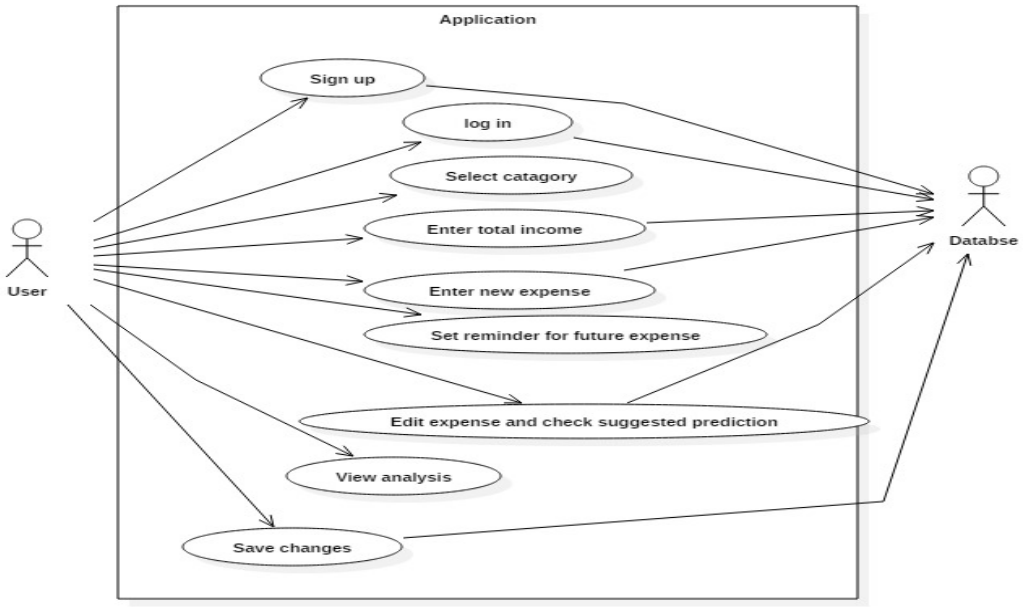


Figure 3.2: UseCase Diagram

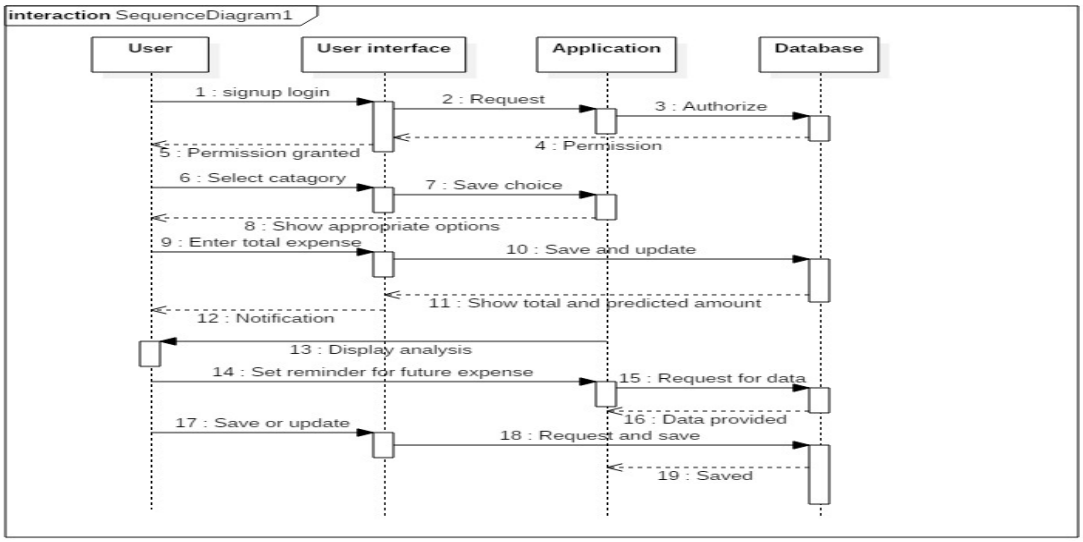


Figure 3.3: Sequence Diagram

Chapter 4

Implementation

4.1 Implementation Plan *for Sem – 8*

Implementation Plan for the Sem - 8 to include the following:
Gantt chart

Figure 4.1: Timeline Chart Sem7

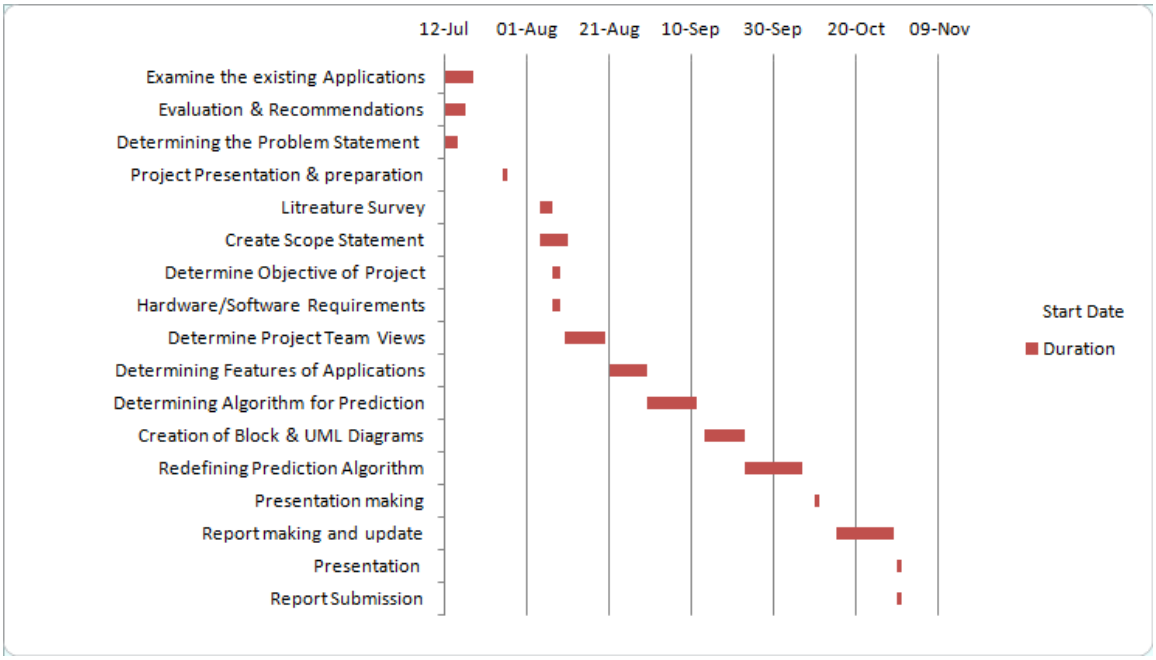
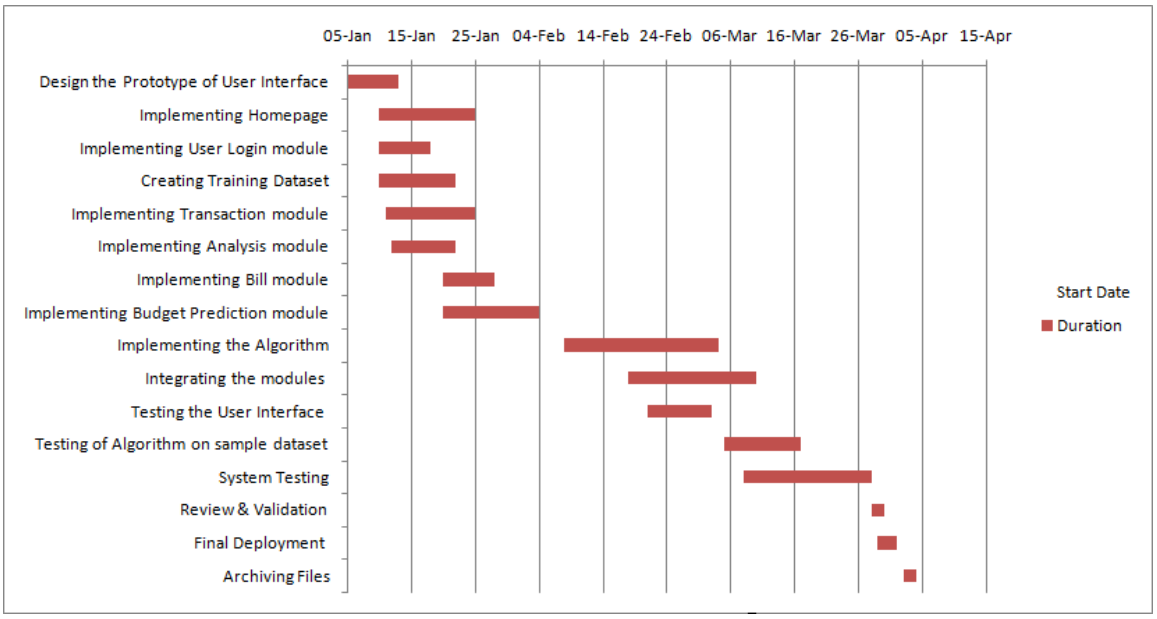


Figure 4.2: Timeline Chart Sem8



Work Break down sturcture with percentage of individual contribution.

4.2 Coding Standard

PEP8 PEP's are python enhancement proposals and they describe and document the way python language evolves . They also rovide a reference point (and a standard) for pythonic way to write code. This is just the style guide for python code.It was designed to help python developers write more readable code.

Variables: Variables should always be easy to read, meaningful lowercase English words.

Functions: Function name should be lowercase with words seperated by underscores as necessary to improve readability. They also should be named insuch a way that they are relevant to the actions that they perform. Religion of variables: camelCase,exception(lists) religion of funtions: separated by underscores.

Time complexity: Time complexity is the computational complexity that measures/estimates the time taken for running an algorithm .It is commonly estimated by counting the number of elementary operations performed by the algorithm, suppose the elementary operation takes a finite amount of time to perform .

Space Complexity: Space complexity is the measure of amount of working storage the algorithm needs. That means the amount of memory the algorithm needs at the worst case .

4.3 Testing

Testing process constitutes checking errors in the code. The main objective of testing is to find the undiscovered errors in the code. There are various methods of testing the code

White Box Testing: To check the control structure of the program White box Testing can be used. Test cases ensure that all the nationalities of the software have been tested at least once.

Black Box Testing: Black box testing is designed to check if the software validations are properly done without considering the internal working of the software.

Unit Testing: In Unit testing all the modules of the software are tested to check if they are in accordance with the modules provided during the design phase. Testing the internal logic of the code is the main motive of Unit testing. White box testing techniques are utilized to check if the control structure is good and does maximum error detection.

Dickey Fuller Test of Stationarity

In statistics, the Dickey–Fuller test tests the null hypothesis of whether a unit root is present in an autoregressive model. The alternative hypothesis is different depending on which version of the test is used, but is usually stationarity or trend-stationarity.

The intuition behind the test is as follows. If the series y is stationary (or trend stationary), then it has a tendency to return to a constant (or deterministically trending) mean. Therefore, large values will tend to be followed by smaller values (negative changes), and small values by larger values (positive changes). Accordingly, the level of the series will be a significant predictor of next period's change, and will have a negative coefficient. If, on the other hand, the series is integrated, then positive changes and negative changes will occur with probabilities that do not depend on the current level of the series; in a random walk, where you are now does not affect which way you will go next.

Eliminating Trend and Seasonality

1.Differencing

One of the most common methods of dealing with both trend and seasonality

is differencing. In this technique, we take the difference of the observation at a particular instant with that at the previous instant. This mostly works well in improving stationarity.

2.Detrending

Here, we simply remove the trend component from the time series. If the trend is deterministic (e.g. a linear trend) you could run a regression of the data on the deterministic trend (e.g. a constant plus time index) to estimate the trend and remove it from the data. If the trend is stochastic you should detrend the series by taking first differences on it.

Dicker Fully Test of Stationarity

X(t) - X(t-1) = (Rho - 1) X(t - 1) + Er(t)

1.Differencing

x(t) – x(t-1) = ARMA (p , q)

This differencing is called as the Integration part in AR(I)MA. Now, we have three parameters

p : AR; d : I ; q : MA

2.Detrending

x(t) = (mean + trend * t) + error

	A	B	C	D
1	PREDICTED	EXPECTED	DIFFERENCE	Accuracy
2	446.903248	400.01	46.893248	88.27698108
3	389.07641	500.01	110.93359	77.81372573
4	434.127574	400.01	34.117574	91.47081973
5	466.26055	670.01	203.74945	69.59008821
6	405.376537	480.01	74.633463	84.4516858
7	593.402163	580.01	13.392163	97.69104619
8	511.701724	650.01	138.308276	78.72213104
9	596.633646	520.01	76.623646	85.26496683
10	674.036042	250.01	424.026042	69.60363265
11	604.825714	150.01	454.815714	203.1902633
12	132.575192	56.01	76.565192	36.69914658
13	102.015496	110.01	7.994504	92.73292973
14	185.20973	80.01	105.19973	31.4832271
15	205.613106	230.01	24.396894	89.39311595
16	258.484366	170.01	88.474366	47.95931651
17	268.718424	320.01	51.291576	83.97188338
18	144.051564	210.01	65.958436	68.59271654
19	126.382605	160.01	33.627395	78.98419161
20	175.329295	140.01	35.319295	74.77373402
21	123.323955	200.01	76.686045	61.65889456
22	107.996727	50.01	57.986727	15.95026395
23	412.86706	170.01	242.85706	42.84869125
24	370.246982	500.01	129.763018	74.04791544
25			OVERALL	
26			ACCURACY	75.87701596
27				

Above table shows the accuracy obtained for sample Data1, which contains the data of the housewife. As a housewife tends to spend more in the beginning of than the ending of the month, Hence the pattern of expenditure is different.

	A	B	C	D	E
31	20.01	45	24.99	124.8875562	
32	15.01	25	9.99	66.55562958	
33	90.01	110	19.99	22.20864348	
34	110.01	130	19.99	18.17107536	
35	150.01	145	5.01	3.339777348	
36	30.01	40	9.99	33.2889037	
37	25.01	35	9.99	39.94402239	
38	15.01	20	4.99	33.24450366	
39	10.01	35	24.99	249.6503497	
40	50.01	61	10.99	21.97560488	
41	17.01	35	17.99	105.7613169	
42	16.01	25	8.99	56.15240475	
43	80.01	110	29.99	37.48281465	
44	50.01	90	39.99	79.9640072	
45	30.01	40	9.99	33.2889037	
46	20.01	40	19.99	99.90004998	
47	20.01	40	19.99	99.90004998	
48	15.01	40	24.99	166.4890073	
49	50.01	90	39.99	79.9640072	
50	25.01	40	14.99	59.93602559	
51	10.01	40	29.99	299.6003996	
52	15.01	25	9.99	66.55562958	
53	120.01	180	59.99	49.98750104	
54	150.01	165	14.99	9.992667156	
55	180.01	110	70.01	38.89228376	
56	25.01	50	24.99	99.92003199	
57	10.01	30	19.99	199.7002997	
58	80.01	95	14.99	18.73515811	
59	110.01	170	59.99	54.53140624	
60					
61			Overall accuracy	73.20670492	
62					

Above table shows the accuracy obtained for sample Data2,which contains the data of a student. As the expenditure pattern differ from individual to individual, a student spends specific amount on daily basis for travelling etc. that has different pattern.

Table 4.1: Accuracy Table

Sr no	Input value	Test cases	Steps to execute	Expected Result	Obtained Result	Status
1	Add Income	Enter Description	Click submit button to save	It will save the record without Description	Record Saved	Pass
2	Add Income	Select the date	Click submit button to save	If date is not entered it will automatically choose today,s date	Record Saved	Pass
3	Add income	Enter the Amount	Click submit button to save	It will only accept the Numerical value	By default Numeric keypad	Pass
4		Add income After App Installation	Add your Income	The App itself initalizes the Balance to be zero if not entered	Current Balance is zero	Pass
5	Edit entered data	Select and Edit the saved data	select the record from the summary(cash)	It will save the edited data	Record is edited and saved	Pass
6	Delete a Record	Select and Delete the saved data	select the record from the summary(cash)	Data record is deleted from summary	Record deleted sucessfully	Pass
7	Export Summary		Go to spend summary section and Click on the button to export data in xls format	Excel sheet of summary is exported	Exported Successfully	Pass

Table 4.2: Test Cases

Above table shows the description of the test cases that are executed on the application

4.3.1 Results of Testing and System Performance

Results of Testing and Integration Testing

The model is prepared on the training data by calling the fit() function.

ARIMA.fit(start$_p$arams $= None, trend =' c', method =' css-mle', transparams =$
$True, solver =' lbfgs', maxiter = 50, full_output = 1, disp = 5,$
$callback = None, start_arlags = None, **kwargs)$
$Fits ARIMA(p,d,q) model by exact maximum likelihood.$

Predictions can be made by calling the predict() function and specifying the index of the time or times to be predicted.

ARIMA.predict(params, start=None, end=None, exog=None, typ='linear', dynamic=False)

Chapter 5

Conclusion & Results

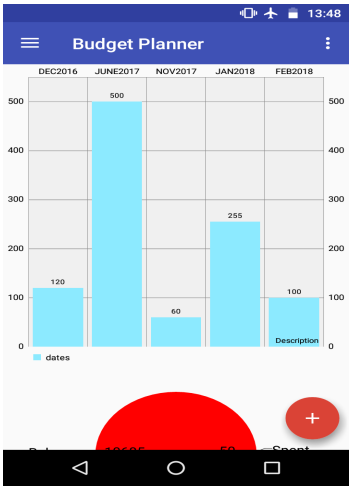


Figure 5.1: Android App Homepage with graph

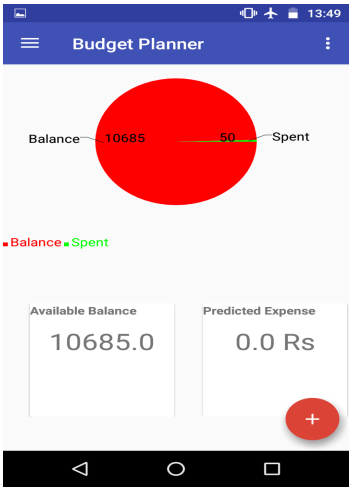


Figure 5.2: Android App Homepage with Balance and Predicted Value

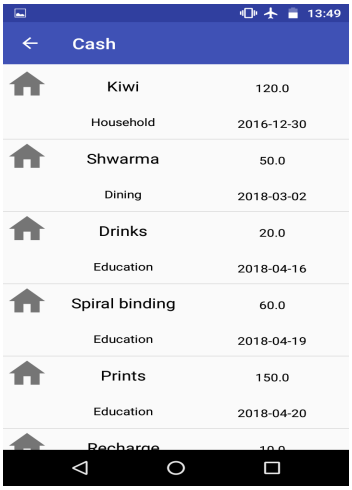


Figure 5.3: Data for Cash Expenses Displayed

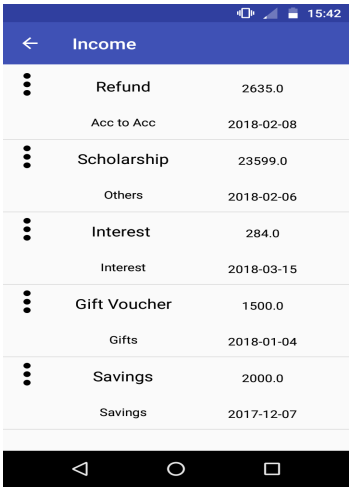


Figure 5.4: Data for Income Added Displayed

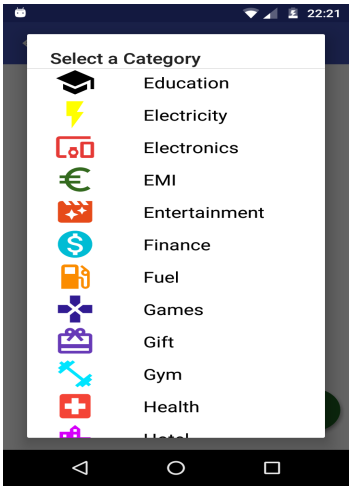


Figure 5.5: Expense Category Selection

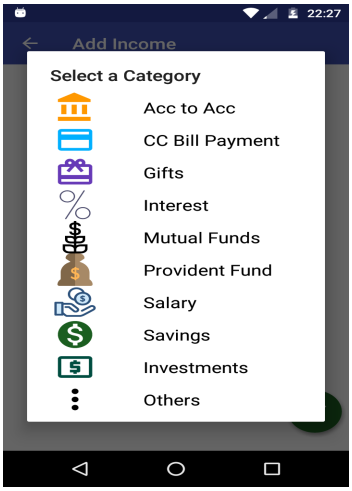


Figure 5.6: Income Category Selection

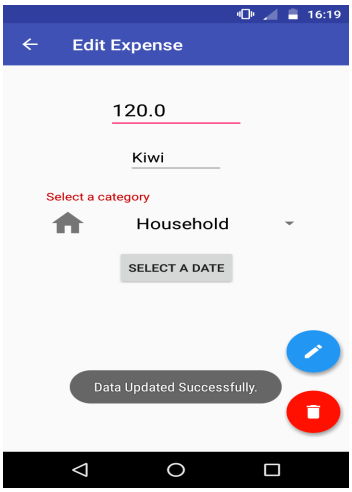


Figure 5.7: Data edited and updated

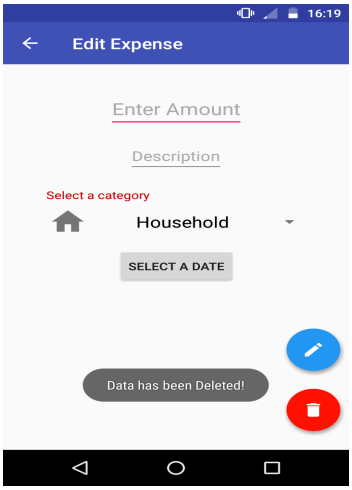


Figure 5.8: Data successfully deleted

ID	TXNTYPE	TXNAMT	CATEGORY	DATE	BA
1	INIT	0	Others	2018-04-11 11:32:53	0
2	Debit	5000	Mobile	2018-04-11 11:04:58	-5
6	Debit	250	Entertainment	2017-06-06 09:04:24	-1
8	Debit	55	Dining	2018-02-22 11:04:17	6
9	Debit	20	Drinks	2018-01-04 11:04:14	6
10	Debit	120	Household	2018-01-04 11:04:23	6
11	Debit	45	Dining	2018-02-23 17:04:06	6
13	Debit	115	Dining	2018-01-24 11:04:59	6
14	Debit	250	Gift	2017-06-01 11:04:50	6
15	Debit	50	Entertainment	2017-11-24 11:04:45	6
17	Debit	10	Mobile	2017-11-23 11:04:31	6
21	Debit		ctronics	2018-03-07 12:04:07	1
24	Debit		ucation	2018-04-20 22:04:10	1

Figure 5.9: Data Exported to Excel

5.0.1 Conclusion

Personal Budget Planner is a mobile application for the different type of user like student, employee, housewife ,where user can manage and track their expenses according to their planned budget. personal budget planner is developed using android studio which is the platform for developing android application which includes the use of the XML and java language. To give user the best possible prediction our application uses ARIMA time series model.so overall our application will help user to track and manage their expenses by keeping prediction value in mind.

5.0.2 Future Scope

In the future work we are aiming to add SMS retrieval module where user's online transaction will be reflected in the application this will reduce manual input work.We will provide the feature of Bill Splitting among the group. We will be adding a user's wallet functionality that will allow user to send and receive money from other user through application.We will also provide feature of saving goals where user will have his saving goal log and he/she plan future savings accordingly.

Appendix - I

AR- Auto Regressive
MA-Moving Average
ARMA- Auto Regressive Moving Average
ARIMA- Auto regressive Integrated Moving Average
AIC- Akaike Information Criterion
RMSE- Root Mean Square Error

References

[1] https://machinelearningmastery.com/time-series-forecast-study-python-monthly-sales-frenc h-champagne/

[2] https://stackoverflow.com Belmont, CA: Wadsworth, 1993, pp. 123135.

[3] https://developer.android.com

[4] Pasapitch Chujai*, Nittaya Kerdprasop, and Kittisak Kerdprasop,"Time Series Analysis of Household Electric Consumption with ARIMA and ARMA Models"International MultiConference of Engineers and Computer Scientists 2013 Vol I,IMECS 2013, March 13 - 15, 2013, Hong Kong

[5] K. V. Sujatha S. Meenakshi Sundaram,"Stock Index Prediction Using Regression and Neural Network Models under Non Normal Conditions",Research Scholar Sathaybama University and Department of Mathematics Sathyabama University Tamilnadu, India

[6] Thi Bich Hong Tu,Minseok Song,Analysis and Prediction Cost of Manufacturing Process Based on Process Mining,School of Business Administration Ulsan National Institute of Science and Technology Ulsan and Department of Industrial Management Engineering POSTECH (Pohang Univ. of Sci. Tech) Pohang, South Korea

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