LOCATION BASED SERVICE FOR THE MOBILE USERS USING THE GPS TECHNOLOGY

A Thesis Submitted to the
Department of Electrical and Electronic Engineering
of
BRAC University
by
Mir Sazzadur Rahman (ID: 11110016)
SM. Hasan Hafizul Haque (ID: 09110059)

In Partial Fulfillment of the
Requirements for the Degree
of
Bachelor of Science in Electronic and Communication Engineering

December 15, 2012

Declaration

We hereby declare that this thesis is based on the results we found by our work. Contents of work found by other researcher(s) are mentioned by reference. This thesis has never been previously submitted for any degree neither in whole nor in part.

Date:

Signature of Supervisor:

Dr. Amitabha Chakrabarty

Signature of Authors:

Mir Sazzadur Rahman
[Student Id.: 11110016]

SM. Hasan Hafizul Haque
[Student Id.: 09110059]

Acknowledgement

First of all we would like to thank the Almighty for giving us the opportunity to complete this work successfully. Our acknowledgement is meant to express our sincere gratitude to all those people who have been associated with this thesis and have helped us with it and by sharing their opinions and experiences through which we received the required information crucial for our thesis.

We are thankful to our parents for their relentless support. Most importantly we are tremendously grateful to our honorable supervisor Dr. Amitabha Chakrabarty who took time out of his hectic schedule to guide us and provide us with all the necessary materials and sufficient knowledge that was the major requirement.

Finally, we express our thanks to our honorable Chairperson Dr. Syeed Salam, Dr. A. K. M. Abdul Malek Azad, Dr. Md Khalilur Rhaman, Mr. Tarem Ahmed and especially Dr. Mohammed Belal Hossain Bhuian for giving us the opportunity to learn the subject in a practical approach.

Abstract

Mobile phone- a mass media for making communication & sharing information in present days among the people has been enriched with different applications by the advancement of internet & network technology. It brought the new eras of services by tracking the location of a mobile user. Our paper explores the possibilities & procedures of marketing of a shopping mall or a brand shop through mobile- using location based application. As technology is an important facilitator and at the same time a limiting factor, we review shortly the technical aspect relevant for LBS. Finally we present a design and implementation of an LBS application running on internet active android operated handsets using the GPS technology as a testing phases and results of our application. We conclude our paper by including the challenges of this mobile application and its corresponding solutions along with our future works in this field.

Contents

Table of Contents

1 Introduction
1.1 Background 1
1.2 Goal of our project 2
1.3 Scope of implementation 3
1.4 Thesis outline 5
2 Literature Survey
2.1 Literature Survey 7
2.2 How to find a present location of a user using GSM 8
2.3 How to find a present location of a user using GPS 8
3 Technological Infrastructures
3.1 Positioning system of LBS 11
3.1.1 Satellite positioning 11
3.1.2 Network based positioning 12
3.1.3 Local positioning 12
3.2 GPS technology 13
3.2.1 How GPS technology work 13
3.2.2 How to calculate distance between two geo locations 15
3.2.3 GPS accuracy. 16
3.2.4 GPS protocols 16
4 Software Used
4.1 MySql. 19
4.2 PHP. 20
4.3 Android operating system. 20
5 Project Overview 23
6 Conclusion and Future work 43
Bibliography 45

List of Figures

3.2 Figure:1 14
5.0 Figure:2 26
5.0 Figure:3. 28
5.0 Figure:4. 32
5.0 Figure:5. 33
5.0 Figure:6. 34
5.0 Figure:7 35
5.0 Figure:8 36
5.0 Figure:9 37
5.0 Figure:10 38
5.0 Figure:11 39
5.0 Figure:12 40

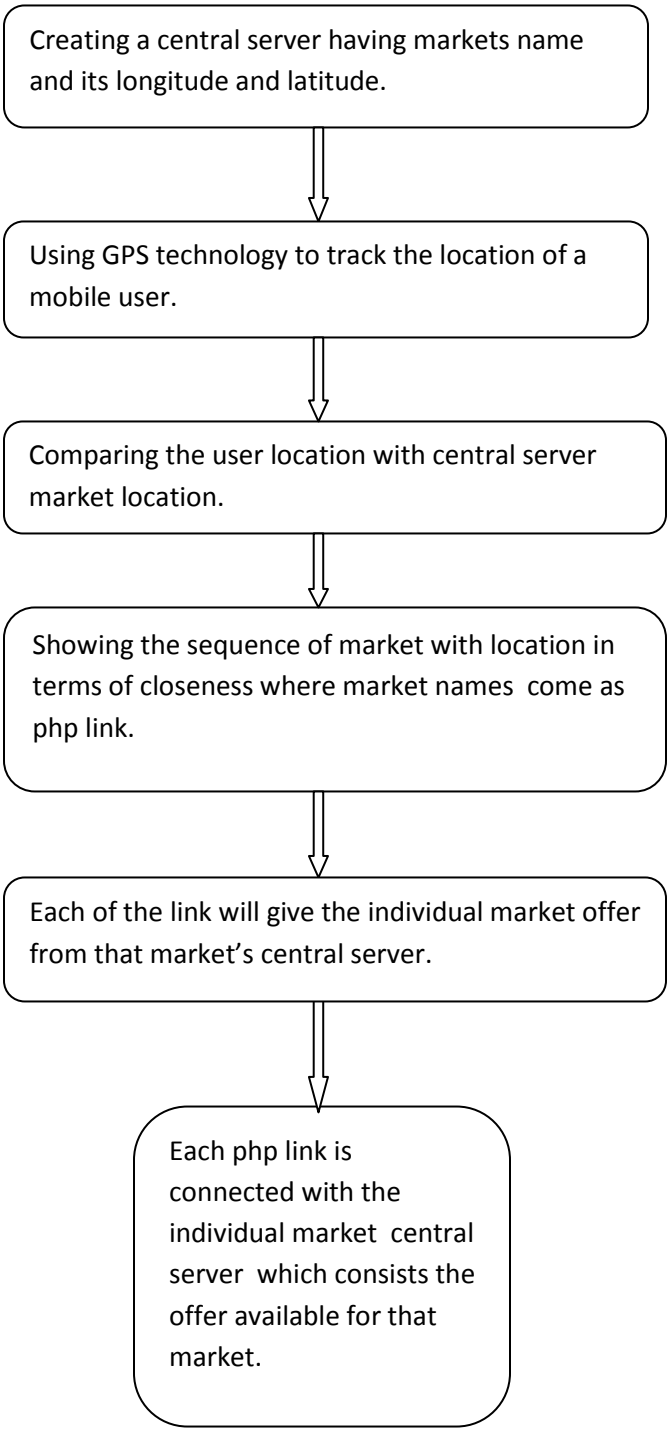
Chapter 1

Introduction

1.1Backgroound

Revolution made by the mobile technology made our modern life easier as it endowing with new services and related commerce with more and more availability. LBS are defined as the ability to locate a mobile user graphically and deliver services to the user based on his location. LBS are any services use spatial data that are available to anyone, anywhere, anytime on any mobile-based device. LBS has a variety of applications that can be offered to organizations such as government, emergency services, commercial and industrial organizations for example – breaking news , traffic information, tracking and way finding. Our goal is to find the use of LBS in our country's perspective. We will try to find a way to make location based mobile advertising. Already in our country mobile operator started to provide some location based services. Our aim is to at first proposing a model of an effective location base service for the user and economically beneficiary for the operators and then showing the demo of the proposed service through a mobile based application.

1.2 Goal of our project



1.3 Scope of implementation:

Lots of work has already done in the field of location base service & the advancement of mobile technology helps to create more user friendly location base applications. We made our project based on android operating system where GPS and internet should be active. But if we can use this application through any mobile operator company then we have an opportunity to provide this service for any operating system supported mobile phone. Mobile operators can provide this service by using the location information of a user they get from the BTS server. They can also demand charge to provide the service to the subscriber & from the market authority for maintaining their server. Moreover, the applications that we proposed in our project have the following usefulness:

- This application will help all the entrepreneur of a shopping mall to advertise their offer to the customer.
- Customer can get automatically the available all new offers for them in a shopping mall.
- Customer can get the information of available shopping mall/brand shops located in their present location.
- Even a grocery shop can advertise his offer to the customer.
- Through this service we can provide service to the market authority as well as to the mass people.
- It also helps to control the market price & creating different types of offer advertisement

  For different types of available market like the following:

Features	Available Services
• Brand shops offer e.g. BATA.	15% discount on men's shoes, 10% discount on children's shoes etc.
• Shopping mall offer e.g. Bashundhara City Mall	25% discount on shop#33, block#d, 6% discount on shop#30 block#a
• Grocery shop offer e.g. Shopno.	Tk100 discount on pair of Hilsha fish,tk10 discount on Polaw rice

	etc.
• Vegetable market price.	Market price provided by the government.

Number of people that would be benefited can be assumed based on the following components:

Components	Our Assumption	Remarks
Size of target group	2.7 million,94% of the total internet user of Bangladesh	Considering number of mobile internet user in Bangladesh.
Internet usage behavior of the target group	Mass people will be interested to use the internet and this application.	This will give the people to access to the information which is inseparable related to their daily life.
Relevance of application to target group	Highly relevant	By the help of this application, general people will get the beneficiary as well as their daily life. So we feel this will be highly relevant to them.

1.4 Thesis Outline

The rest of this report is organized as follows. Chapter-2 discusses Literature review, Chapter-3 Technical Infrastructure related to our project & the description of GPS system, Chapter-4 includes the software description those we used in our project, Chapter-5 have the project overview & finally we conclude in Chapter-6.

Chapter 2

Literature Survey

2.1 Literature Survey:

Location base service provides a huge field to work on. The papers those we go through in the process of our total research provide us to get an immense idea of how location base service works on different communication platform. Already there are some services based on a user's location started to provide in our country. Dynamic pricing offer of Grameenphone which is basically an offer of special call rate of a user -based on which zone he is located in or the "GP Buddy Tracker" or "Banglalink Friend Finder" which are basically use to track our friends & families , also the examples of location base service available in our country. But these popular location base services provided by the mobile operators SMS service using the GSM network [11]. So track the location of a user we don't need to have an internet connection to provide those services. Some of our mobile application developer used the LBS API provided by mobile operator to develop some LBS services. But due to the development of the security of this platform this is not available now. So the location information of a mobile user that is available from the GSM network is no more available in our country for the mobile application developer who wants to develop location base service in our country's perspective. So our work is based on GPS network where we use the GPS technology to track the location of our mobile user [7] [8] [9]. The reasons of using GPS are- we get the location information of a mobile user in free of cost from GPS, the availability of smart phones in our country increasing day by day, we don't need to depend on mobile operator's permission to develop our application, problems occur to

get consistent signal from GSM network & the unavailability of tracking location through GSM network for using general purpose.

2.2 How to find a present location of a mobile user using GSM:

A cell phone is basically a sophisticated two-way radio. Towers and base stations, arranged into a network of cells, send and receive radio signals. Cell phones contain low-power transmitters that let them communicate with the nearest tower.

As you travel, you move from one cell to another, and the base stations monitor the strength of your phone's signal. As you move toward the edge of one cell, your signal strength diminishes. At the same time, the base station in the cell you are approaching notices the strength of your signal increasing. As you move from cell to cell, the towers transfer your signal from one to the next.

In remote locations, towers may be so far apart that they can't provide a consistent signal. Even when towers are plentiful, mountains and tall buildings can interrupt their signals. Sometimes people have a hard time getting clear signals inside buildings, especially in elevators [11].

Even without a GPS receiver, your cell phone can provide information about your location. A computer can determine your location based on measurements of your signal, such as:

1. Its angle of approach to the cell towers
2. How long it takes the signal to travel to multiple towers
3. The strength of your signal when it reaches the towers

2.3 How to find a present location of a mobile user using GPS:

All cell phones constantly broadcast a radio signal, even when not on a call. The cell phone companies have been able to estimate the location of a cell phone for many years using triangulation information from the towers receiving the signal. However, the introduction of GPS technology into cell phones has meant that cell phone GPS tracking now makes this information a lot more accurate. With GPS technology now more commonplace in many new smartphones, this means that the location of anyone carrying a GPS enabled smartphone can be accurately tracked at any time. Cell phone GPS tracking can therefore be a useful feature for business owners, parents, friends and co-workers looking to connect with one another. Since a cell phone already works like a two-way radio when communicating with cell towers, the GPS capability simply extends the radio signal reach to space satellites. A-GPS technology is the advanced technology which suited for mobile devices more accurately. A-GPS takes assistance from GPRS and at times, the service provider network information, to pin-point the current location

accurately. Moreover the amount of CPU and programming required for a GPS phone is reduced by diverting most of the work to the assistance server instead.

A typical A-GPS enabled Cell phone uses a GPRS or other such Internet based data connection to build a contact with the assistance server for A-GPS. This exercise usually is a bit slow if we are connecting with the server for the first time. As this technique does not take into account the cell phone service provider network completely, we only pay the GPRS usage charges and nothing else. The only down-side to this technology is that an A-GPS server cannot utilize any of the three standby satellites available for GPS connections [7].

Chapter 3

Technological Infrastructures

3.1 Positioning systems of LBS:

Location based services, require specific infrastructure for positioning the mobile terminal. Positioning means determination of the location of the object in a reference system. The reference system can be a coordinate or address system, areal division or route system. Geocoding is a process used for associating the object to general coordinate system. The systems offering positioning for mobile terminals in LBS are divided to three main classes, satellite positioning, network-based positioning and, local positioning. Different positioning systems and techniques varies with their features, such as accuracy, reliability and time-to-fix.

3.1.1 Satellite Positioning:

Satellite positioning systems use an infrastructure of earth-orbiting satellites and receiver terminals. The terminals calculate the position based on the information received through the radio signals from three or more satellites. The terminal-based method provides 10-40 meter accuracy. It renders the user totally independent of the mobile network with respect to positioning, and, in principle, allows access to any location-based services from third-party service providers. Most well-known and widely used satellite positioning system is GPS. It uses infrastructure-based assistance and different terminals. In mobile network environment, there

exists also a solution called Assisted-GPS solution, where additional data for the GPS receiver is send through mobile network. Assisted-GPS is a hybrid solution which makes the positioning of a mobile terminal including GPS receiver to be positioned faster and more accurately positioning [7].

3.1.2 Network-based positioning:

The network-based positioning systems refer to positioning methods where the mobile telecommunication networks are used for providing or supporting the positioning of mobile terminals. They include several different methods that are standardized in mobile network specifications. The basis for the diverse network-based methods is that the coordinates of the base stations are known and that the distance of the terminal from the base stations can be measured or at least approximated. The approximation without any measurements is called Cell Identity (CI). In CI method, the terminal position is approximated by specified coordinates on the cell area, defined based on the cell coverage. The accuracy of the method varies from a few tens of meters to several kilometers. The above method can be improved by using Timing Advance (TA) parameter that is readily available in GSM networks at low cost. Using it, methods can be used to increase the accuracy estimate of the CI-method. The more accurate network-based positioning methods use explicit measurements. In measuring the terminal receives signals from at least three different base stations, or three or more base stations receive signals from the terminal. Based on the measurement the position of the terminal can be calculated at the terminal or in the network. There are different network signal measurements positioning methods, including: Angle of Arrival (AOA), Time of Arrival (TOA), Enhanced Observed Time Difference (E-OTD) and Observed Time Difference of Arrival – Idle Period Down Link (OTDOA- IPDL). The network-based positioning methods differ in many some aspects. The positioning accuracy is method dependent, between 50m to several kilometers; In CI method even up to tens of kilometers [8].

3.1.3 Local positioning:

The third main class of positioning systems is local positioning. It refers to positioning that operates only in restricted area and based on short distance signal transmission. It covers specifically location-based services in indoor environments like large buildings, shopping centers, etc., where satellite and mobile network positioning methods are not well applicable or precise enough. Local positioning methods include positioning methods where wireless local area networks (WLAN), Bluetooth technology, radio frequency identification (RFID) or Infrared(IrDA) technologies (Active Badges etc.) are utilized [7].

3.2 GPS Technology

Since obstacles like trees and buildings can affect how long it takes our signal to travel to a tower in GSM method so that we use GPS measurement method. In order to determine our location GPS receiver has to determine:

- The location of three at least satellites above us
- And where we are in relations to those satellites

The receiver then uses trilateration to determine our exact location. Basically, it draws a sphere around each of three satellites it can locate. These three spheres intersect in two points -- one is in space, and one is on the ground. The point on the ground at which the three spheres intersect is our location.[11]

3.2.1 How GPS technology work:

A GPS tracking system uses the Global Navigation Satellite System (GNSS) network. This network incorporates a range of satellites that use microwave signals that are transmitted to GPS devices to give information on location. It is a worldwide radio-navigation system formed from the constellation of 24 satellites and their ground stations. The Global Positioning System is mainly funded and controlled by the U.S Department of Defense (DOD). The system was initially designed for the operation of U. S. military. But today, there are also many civil users using GPS without any kind of charge or restrictions.

Figure: 1

GPS uses 27 satellites (24 currently working, 3 are meant for backup, in case of failure) to enable a person to pin-point his current location. The calculation to ascertain the location is based on a simple arithmetic theory known as trilateration. Since the Earth is a sphere, each satellite generates a specific part of the sphere it hovers and revolves with. An intersection of three such spheres which is closest to the GPS device's location is done and the location is thus identified. This technique of trilateration is known as 3D trilateration. To gather the requesting device's current location and provide accurate response, the GPS receiver requires two vital details, i.e. the location of at least three satellites above it and the distance the device and each of those satellites. This position is accurate from about 10 to15 meters—now that selective availability, an intentional degradation of the satellite signals, has been turned off—down to a centimeter or less, depending on equipment and conditions.

GPS is capable of providing an exact three-dimensional position (latitude, longitude, and altitude) anywhere on the earth, 24 hours a day, in any weather condition. It consists of three components: space, control, and user segments.

The space segment is a constellation of 24 active satellites—as well as a few spares—orbiting the earth at a height of approximately 12,600 miles in six evenly distributed orbital planes. The control segment consists of five tracking stations spread out around the earth that monitor the satellites' orbits and send precise orbital data and clock corrections back to the satellites. The user segment is made up of GPS receivers and the user community.

Each satellite transmits signals on two frequencies: L1 (1575.42 MHz) and L2 (1227.60 MHz). The L1 frequency contains the civilian Coarse Acquisition (C/A) Code as well as the military Precise (P) Code. The L2 frequency contains only the P code. The P code is encrypted by the military—using a technique known as anti-spoofing—and is only available to authorized personnel. The encrypted P code is referred to as the Y Code. Civilian GPS receivers use the C/A Code on the L1 frequency to compute positions—although high-end survey grade civilian receivers use the L1 and L2 frequencies' carrier waves directly. Military GPS receivers use the P (Y) Code on both L1 and L2 frequencies to compute positions. New GPS satellites also transmit on the L5 (1176.45 MHz) frequency. However it will be some time before there are sufficient GPS satellites transmitting the L5 frequency and before there are readily available GPS receivers that are capable of receiving the L5 frequency [9].

3.2.2 How to calculate distance between two geo locations:

To calculate the distance between two geo locations on the surface of the earth (while working with geo data) there is a formula named Haversine function:

$haversin(\Theta) = sin^2(\Theta/2)$.

The Haversine formula is:

$R =$Earth's radius (mean radius = 6367.45 km)

$\Delta lat = lat_2 - lat_1$

$\Delta long = long_2 - long_1$

$a = sin^2(\Delta lat/2) + cos(lat_1)cos(lat_2)sin^2(\Delta long/2)$

$c = 2atan2(\sqrt{a}, \sqrt{(1-a)})$

$d = Rc$

Here the distance $d$in kilometers will be calculated based on the latitudes and longitudes of the two points on the earth, expressed in radians. To convert from degrees to radians, simply multiply the value in degrees by$\pi/180$. The $atan2()$function is a function implemented in many computer languages and is a variation on the arctangent function.

The error of this formula in calculating distances is about 0.1% and mostly due to the fact that the Earth is not a perfect sphere .Also numerical rounding errors can occur, but this is mainly an issue when the two locations are very nearly antipodal (on opposite sites of the Earth), which is generally not often be used [10].

3.2.3 GPS accuracy:

Although GPS receivers give exact positions—for example, 34° 28' 18.8765"N, 122° 15' 34.0832"W, 302.56 meters elevation—it is important to understand that there is some amount of uncertainty, or error, inherent in these positions. A number of factors contribute to this error including satellite clock drift, atmospheric conditions, measurement noise, and multipath. In addition, due to the satellite geometry, vertical accuracy (elevation) is generally one and a half to three times worse than horizontal accuracy. . We should consider each GPS position as a box, and you are somewhere within that box. The size of that box depends on the overall accuracy of our GPS receiver.

A typical A-GPS enabled Cell phone uses a GPRS or other such Internet based data connection to build a contact with the assistance server for A-GPS. This exercise usually is a bit slow if we are connecting with the server for the first time. As this technique does not take into account the cell phone service provider network completely, we only pay the GPRS usage charges and nothing else. The only down-side to this technology is that an A-GPS server cannot utilize any of the three standby satellites available for GPS connections [7].

3.2.4 GPS protocols:

GPS uses various types of protocols. Among them NMEA is a standard protocol, use by GPS receivers to transmit data. NMEA output is EIA-422A but for most purposes it considers RS-232 compatible. Use 4800 bps, 8 data bits, no parity and one stop bit (8N1). NMEA 0183 sentences are all ASCII. Each sentence begins with a dollar sign ($) and ends with a carriage return linefeed (<CR><LF>). Data is comma delimited. All commas must be included as they act as markers. Some GPS do not send some of the fields. A checksum is optionally added (in a few cases it is mandatory). Following the $ is the address field aaccc. aa is the device id. GP is used to identify GPS data [5] [6].

NMEA Interpreted 19 sentences. They are:

$GPBOD - Bearing, origin to destination
$GPBWC - Bearing and distance to waypoint, great circle
$GPGGA - Global Positioning System Fix Data
$GPGLL - Geographic position, latitude / longitude
$GPGSA - GPS DOP and active satellites
$GPGSV - GPS Satellites in view
$GPHDT - Heading, True
$GPR00 - List of waypoints in currently active route

$GPRMA - Recommended minimum specific Loran-C data
$GPRMB - Recommended minimum navigation info
$GPRMC - Recommended minimum specific GPS/Transit data
$GPRTE - Routes
$GPTRF - Transit Fix Data
$GPSTN - Multiple Data ID
$GPVBW - Dual Ground / Water Speed
$GPVTG - Track made good and ground speed
$GPWPL - Waypoint location
$GPXTE - Cross-track error, measured
$GPZDA - Date & Time

$GPGGA

Example: $--GGA,hhmmss.ss,llll.ll,a,yyyyy.yy,a,x,xx,x.x,x.x,M,x.x,M,x.x,xxxx ; here the symbols have their usual meanings which is given below:

hhmmss.ss = UTC of position
llll.ll = latitude of position
a = N or S
yyyyy.yy = Longitude of position
a = E or W
x = GPS Quality indicator (0=no fix, 1=GPS fix, 2=Dif. GPS fix)
xx = number of satellites in use
x.x = horizontal dilution of precision
x.x = Antenna altitude above mean-sea-level
M = units of antenna altitude, meters
x.x = Geoidal separation
M = units of geoidal separation, meters
x.x = Age of Differential GPS data (seconds)
xxxx = Differential reference station ID .

Chapter 4

Software Used

4.1 MySql

MySql is the world's most used open source relational database management system. The SQL phrase stands for Structured Query Language. MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP open source web application software stack. LAMP is an acronym for "Linux, Apache, MySQL, Perl/PHP/Python." Free-software-open source projects that require a full-featured database management system often use MySQL. Our project is prepared for the android operating system which is an open source operating system. We use MySql to create the database server having the market location information.

MySQL can be built and installed manually from source code, but this can be tedious so it is more commonly installed from a binary package unless special customizations are required. On most Linux distributions the package management system can download and install MySQL with minimal effort, though further configuration is often required to adjust security and optimization settings.

Though MySQL began as a low-end alternative to more powerful proprietary databases, it has gradually evolved to support higher-scale needs as well. It is still most commonly used in small to medium scale single-server deployments, either as a component in a LAMP-based web application or as a standalone database server. Much of MySQL's appeal originates in its relative simplicity and ease of use, which is enabled by an ecosystem of open source tools such as phpMyAdmin [2].

4.2 PHP

PHP is an open source general-purpose server-side scripting language originally designed for Web development to produce dynamic Web pages. It is one of the first developed server-side scripting languages to be embedded into an HTML source document rather than calling an external file to process data. The code is interpreted by a Web server with a PHP processor module which generates the resulting Web page. It also has evolved to include a command-line interface capability and can be used in standalone graphical applications.

PHP acts primarily as a filter, taking input from a file or stream containing text and/or PHP instructions and outputting another stream of data; most commonly the output will be HTML. Originally designed to create dynamic Web pages, PHP now focuses mainly on server-side scripting.

We use PHP to create individual market server, where we keep the information of different existing offer provided by the shops of that market. In our project, after pressing the "Show Market Offer" button we go to the web page where the name of different market appears as a web link and the sequence of market depends on the closeness of the market from the individual user's location. When we click on the link of that market then the name of the shops having offers appear to us as a web link. After selecting the market name we get the offer in detail.

4.3 Android operating system:

Android is a open source and Linux based operating system designed for touch screen mobile device such as smart phones and tablet computers. This open source code and permissive licensing allows the software to be freely modified and distributed by device manufacturers, wireless carriers and enthusiast developers. Android has a growing selection of third party applications, which can be acquired by users either through an app store such as Google Play or the Amazon Appstore, or by downloading and installing the application's APK file from a third-party site. Applications are developed in the Java language using the Android software development kit (SDK). The SDK includes a comprehensive set of development tools, including a debugger, software libraries, a handset emulator based on QEMU, documentation, sample code, and tutorials. The officially supported integrated development environment (IDE) is Eclipse using the Android Development Tools (ADT) plug-in. It consists of a kernel based on the Linux kernel 2.6 and Linux Kernel 3.x (Android 4.0 onwards), with middleware, libraries and APIs written in C and application software running on an application framework which includes Java-compatible libraries based on Apache Harmony. Different versions of Android devices are given below [1]:

Version	Code name	API Level
4.2	*Jelly Bean*	17
4.1.x	*Jelly Bean*	16
4.0.x	*Ice Cream Sandwich*	15
3.2	*Honeycomb*	13
3.1	*Honeycomb*	12
2.3.3–2.3.7	*Gingerbread*	10
2.3–2.3.2	*Gingerbread*	9
2.2	*Froyo*	8
2.0–2.1	*Eclair*	7
1.6	*Donut*	4
1.5	*Cupcake*	3

The project we developed for Gingerbread version using API level 10, it also supports up to Ice Cream Sandwich version.

Chapter 5

Project Overview

Project overview:

Our server in created in cpannel which is an online server.We uploaded our “addmarket.php” files & “getallproduct.php” files there , created our database using mysql which is “projectLocation.sql” files & used JSONParser function of android operatin system to fetch data in our mobile from database. Following programs & Figure 2-3 shows how we implement this application. Then figure 4 show how the application will appear in our smart phones; figure 5-8 shows how the application work after getting our location from GPS & then figure 9-12 ensure dynamically working capability of our application as we can put any GPS location in our longitude & latitude box and get only the market offer which have the 500 meter distance from the location.

#projectLocation.sql code of the program:

-- phpMyAdmin SQL Dump

-- version 3.4.11.1

-- http://www.phpmyadmin.net

--

-- Host: localhost

```
-- Generation Time: Dec 10, 2012 at 12:56 AM
-- Server version: 5.1.65
-- PHP Version: 5.2.9

SET SQL_MODE="NO_AUTO_VALUE_ON_ZERO";
SET time_zone = "+00:00";


/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
/*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS
*/;
/*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
/*!40101 SET NAMES utf8 */;

--
-- Database: `tjlpwfdi_sosfreeandro`
--

-- --------------------------------------------------------

--
-- Table structure for table `projectLocation`
--

CREATE TABLE IF NOT EXISTS `projectLocation` (
  `pidt` int(10) NOT NULL AUTO_INCREMENT,
  `market_name` text NOT NULL,
  `lat` float(50,12) NOT NULL,
  `lngi` float(50,12) NOT NULL,
```

```
  `offer` text NOT NULL,
  `mname` text NOT NULL,
  `extra` text NOT NULL,
  `extraint` int(5) NOT NULL,
  PRIMARY KEY (`pidt`)
) ENGINE=MyISAM  DEFAULT CHARSET=utf8 AUTO_INCREMENT=18 ;

--
-- Dumping data for table `projectLocation`
--

INSERT INTO `projectLocation` (`pidt`, `market_name`, `lat`, `lngi`, `offer`, `mname`, `extra`, `extraint`) VALUES
(1, 'boshundhara', 24.000000000000, 90.000000000000, '50% discount', 'unknown', 'nothing', 1),
(10, 'qweq', 23.740150451660, 90.433769226074, '60%discount', 'unknown', 'nn', 1),
(12, 'bashaboo', 23.740150451660, 90.433769226074, '60%discount', 'unknown', 'nn', 1),
(15, 'Uttara', 23.740150451660, 90.433769226074, '60%discount', '3rd floor', 'nn', 1),
(17, 'khilgaon', 23.740150451660, 90.433769226074, '60%discount', '3rd floor', 'catseye', 1);

/*!40101 SET CHARACTER_SET_CLIENT=@OLD_CHARACTER_SET_CLIENT */;
/*!40101 SET CHARACTER_SET_RESULTS=@OLD_CHARACTER_SET_RESULTS */;
/*!40101 SET COLLATION_CONNECTION=@OLD_COLLATION_CONNECTION */;
```

getallproduct.php code of the program:

```
<?php
include("bo/include/config.php");
 $link = connect_db();
```

```
$sql = "select * from projectLocation";
$query = mysql_query($sql, $link);

require_once("JSON.php");
$json = new Services_JSON();
while ($row = mysql_fetch_assoc($query)) {
//echo $row[0];
$arr[] = $row;

  }
print($json->encode($arr));
?>
```

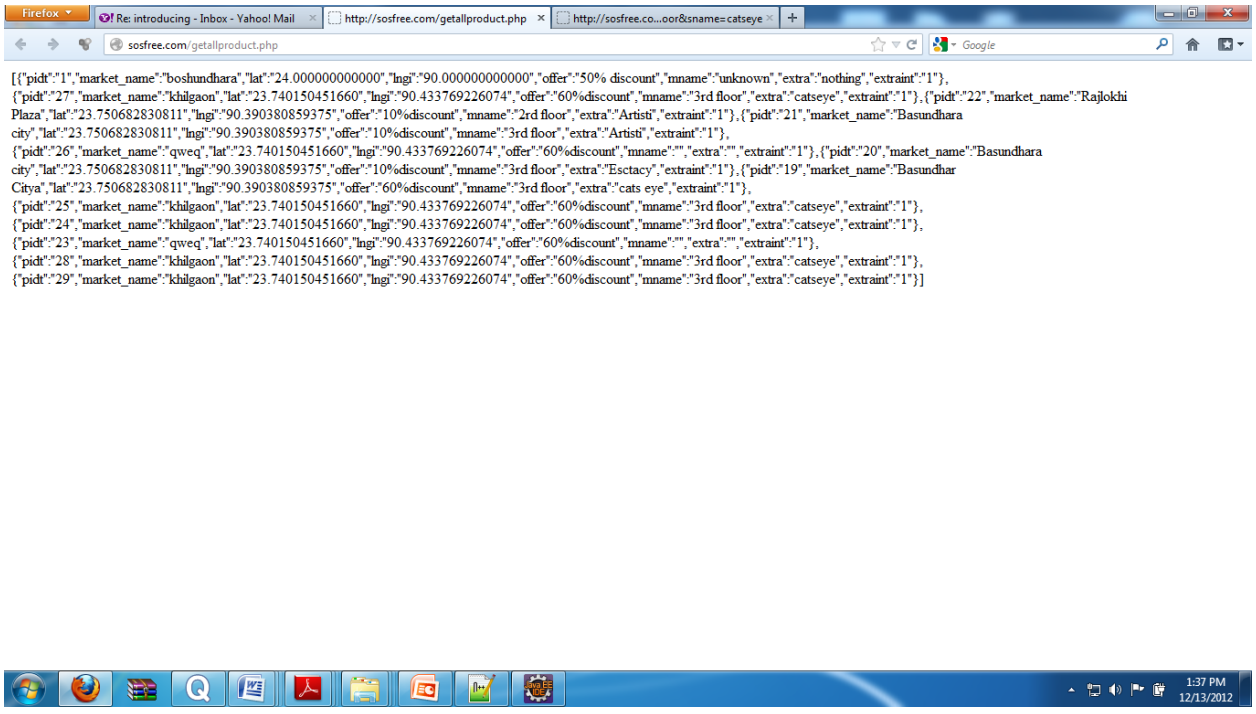


Figure: 2

#addmarket.php code of the program:

```
<?php
        include("bo/include/config.php");
      $link = connect_db();
$name = $_GET[name];
$add = $_GET[add];
$sname = $_GET[sname];
$lat = $_GET[lat];
$lng = $_GET[lng];
$offer = $_GET[offer];
$sql = "insert into projectLocation values(0,'$name',$lat,$lng,'$offer','$add','$sname',1)";
//echo $sql;
$query = mysql_query($sql, $link);
echo $name.$add.$sname.$offer;
?>
```

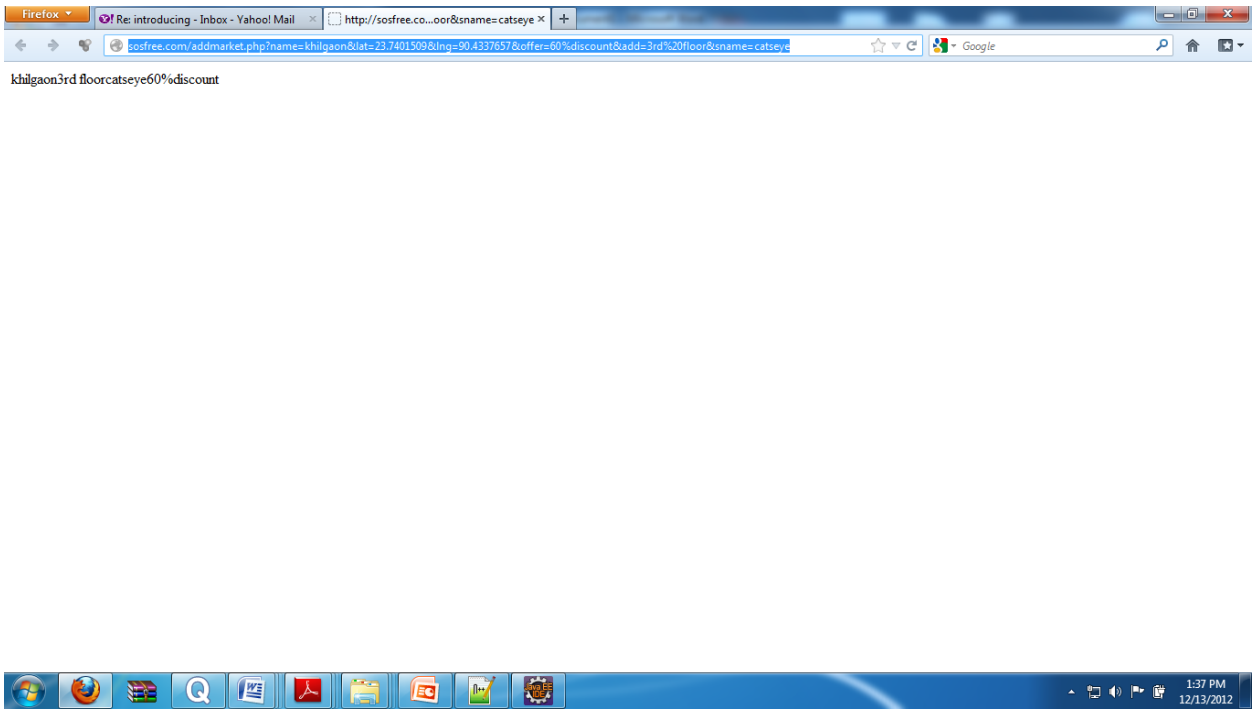


Figure: 3

#JSONParser.java code of the program

```
#package com.example.locationbasedad;

import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.io.UnsupportedEncodingException;
import java.util.List;

import org.apache.http.HttpEntity;
```

```
import org.apache.http.HttpResponse;
import org.apache.http.NameValuePair;
import org.apache.http.client.ClientProtocolException;
import org.apache.http.client.entity.UrlEncodedFormEntity;
import org.apache.http.client.methods.HttpGet;
import org.apache.http.client.methods.HttpPost;
import org.apache.http.client.utils.URLEncodedUtils;
import org.apache.http.impl.client.DefaultHttpClient;
import org.json.JSONException;
import org.json.JSONObject;

import android.content.Context;
import android.util.Log;

public class JSONParser {

	static InputStream is = null;
	static JSONObject jObj = null;
	static String json = "";

	// constructor
	public JSONParser() {

	}

	// function get json from url
	// by making HTTP POST or GET mehtod
	public JSONObject makeHttpRequest(Context con, String url, String method,
```

```
        List<NameValuePair> params) {
// Making HTTP request
try {
        // check for request method
        if (method == "POST") {
                // request method is POST
                // defaultHttpClient
                DefaultHttpClient httpClient = new DefaultHttpClient();
                HttpPost httpPost = new HttpPost(url);
                httpPost.setEntity(new UrlEncodedFormEntity(params));
                HttpResponse httpResponse = httpClient.execute(httpPost);
                HttpEntity httpEntity = httpResponse.getEntity();
                is = httpEntity.getContent();
        } else if (method == "GET") {
                // request method is GET
                // DefaultHttpClient httpClient = new DefaultHttpClient();
                // String paramString = URLEncodedUtils.format(params, "utf-8");
                // url += "?" + paramString;
                // HttpGet httpGet = new HttpGet(url);
                //
                // HttpResponse httpResponse = httpClient.execute(httpGet);
                // HttpEntity httpEntity = httpResponse.getEntity();
                // is = httpEntity.getContent();
                is = con.getResources().openRawResource(R.raw.msgitems);
        }
} catch (UnsupportedEncodingException e) {
        e.printStackTrace();
} catch (ClientProtocolException e) {
```

```
                e.printStackTrace();
            } catch (IOException e) {
                e.printStackTrace();
            }
        try {
                BufferedReader reader = new BufferedReader(new InputStreamReader(
                        is, "iso-8859-1"), 8);
                StringBuilder sb = new StringBuilder();
                String line = null;
                while ((line = reader.readLine()) != null) {
                    sb.append(line + "\n");
                }
                is.close();
                json = sb.toString();
            } catch (Exception e) {
                Log.e("Buffer Error", "Error converting result " + e.toString());
            }
            // try parse the string to a JSON object
            try {
                jObj = new JSONObject(json);
            } catch (JSONException e) {
                Log.e("JSON Parser", "Error parsing data " + e.toString());
            }

            // return JSON String
            return jObj;
        }
}
```

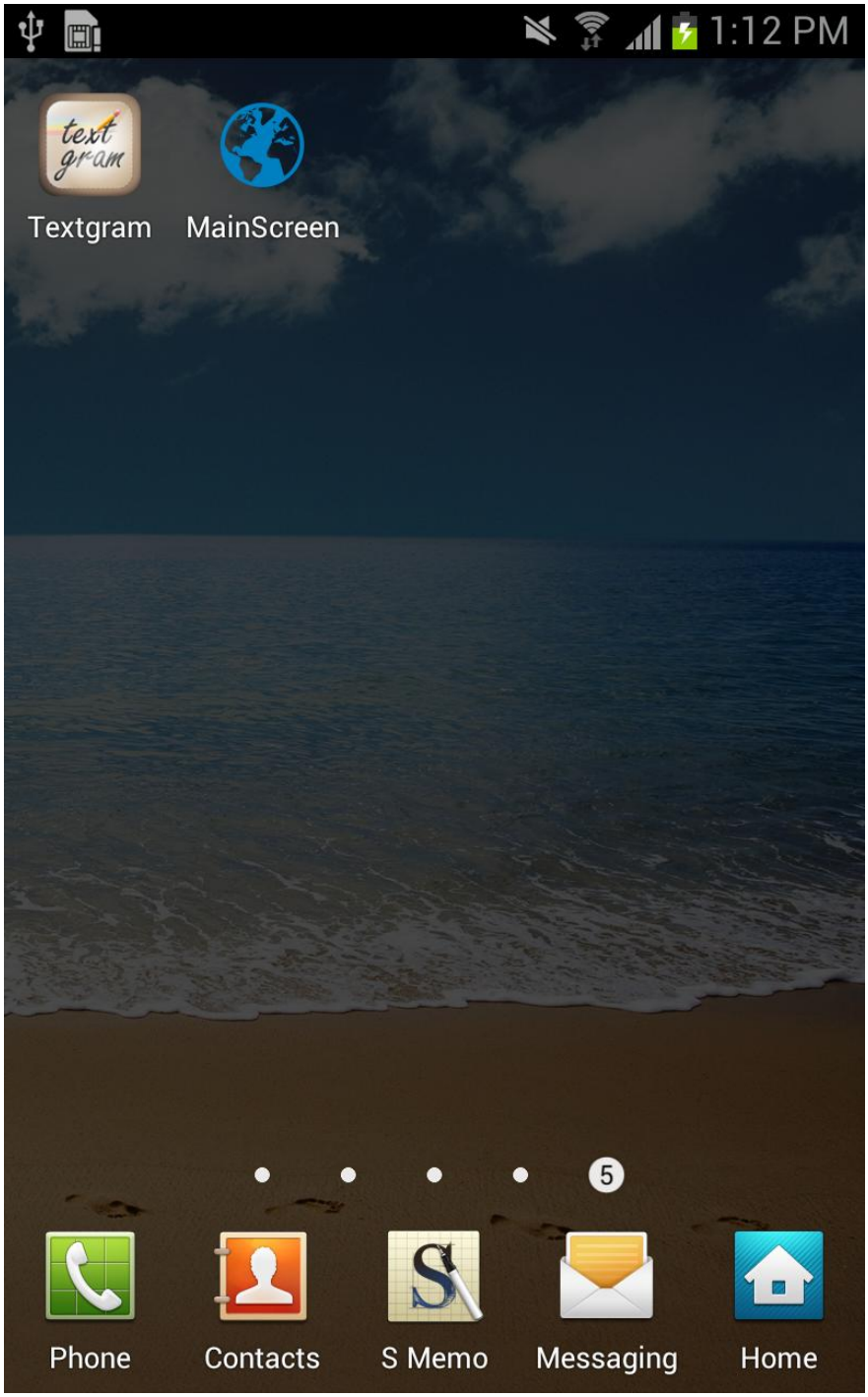

1:12 PM
Textgram
MainScreen
5
Phone
Contacts
S Memo
Messaging
Home

Figure: 4

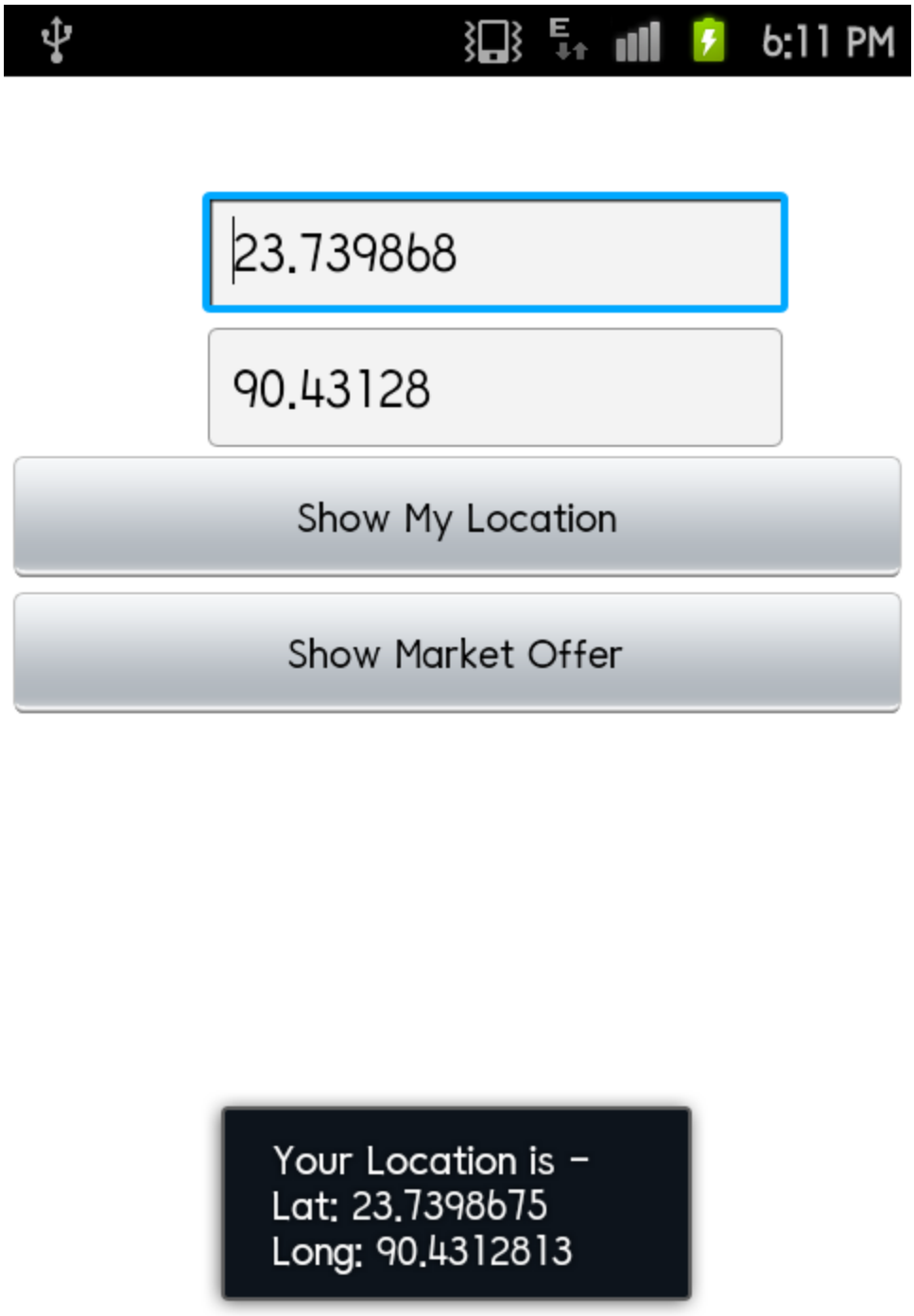

6:11 PM
23.739868
90.43128
Show My Location
Show Market Offer
Your Location is -
Lat: 23.7398675
Long: 90.4312813

Figure: 5

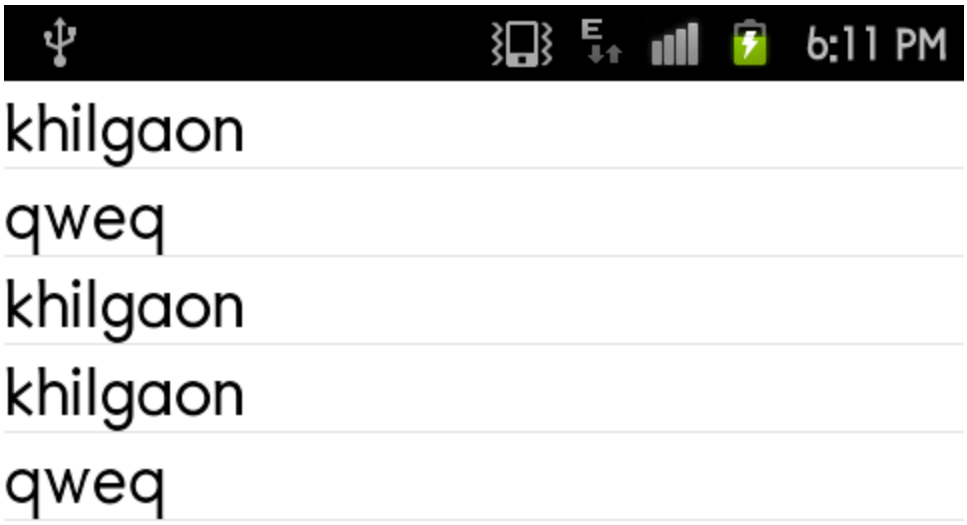


Figure: 6

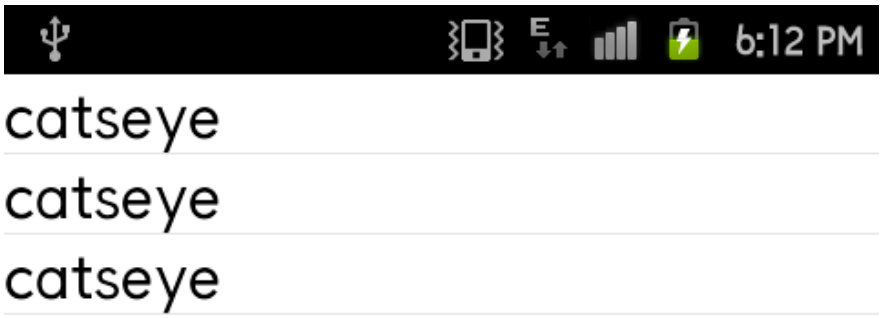


Figure: 7

Figure: 8

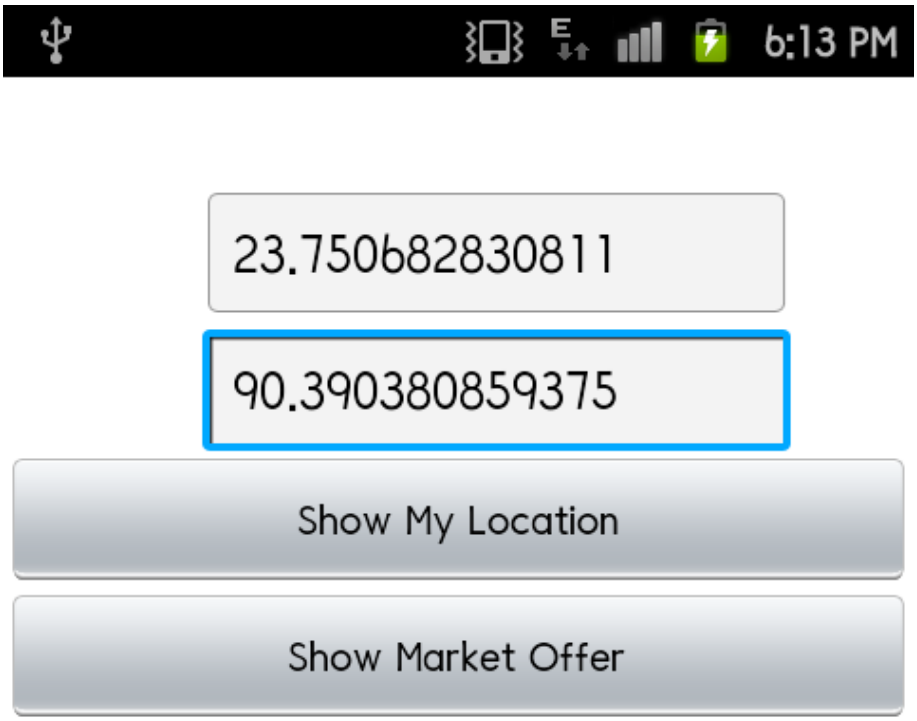

6:13 PM
23.750682830811
90.390380859375
Show My Location
Show Market Offer

Figure: 9

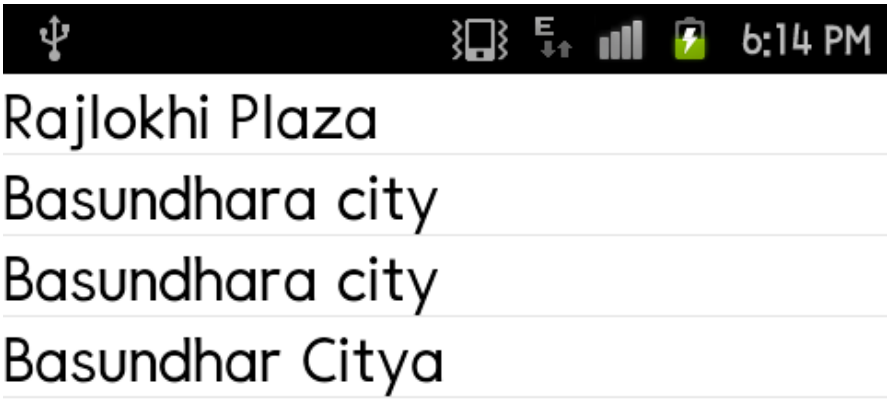

6:14 PM
Rajlokhi Plaza
Basundhara city
Basundhara city
Basundhar Citya

Figure: 10

Figure: 11

Figure: 12

Chapter 6

Conclusion and Future work

6.1 Conclusion:

Location based service will start a new era for the Bangladeshi mobile users. It will make life easier and comfortable. By using GPS technology people can locate his own present location and by comparing with the market server can know the market offers and information's without being enter into the market. It will provide a greater opportunity for the mobile users as well as the market authority to advertise their market information.
This project that we have completed is focused on mobile location that we found from the GPS technology and we developed it for Android operating system. Here we use Mysql database to create a central server and PHP programming language to fetch the data and connect with database and also compare the locations. In our project the legal authority can have the only access to develop the server information.

6.2 Future work:

The project was successfully completed for Android operating system. But in future if possible we want to make this service automated means the offer will automatically showed to the mobile screen of a mobile user if they once activate the application and we want to develop this application for commercial purpose.

Bibliography

[1] Wikipedia, “Android Operating System,” http://**en.wikipedia.org/wiki/,** 2012.

[2] MySql, “MySql work,” http:// **www.dev.musql.com**.

[3] Android, “Android application work,” http:// **developer.android.com**.

[4] GPS Location, “Tracking GPS location in Android,” http:// **www.javacodegeeks.com**.

[5]NMEA protocol, “NMEA Protocol,” http://**www.kh-gps.de/nmea-faq.htm**.

[6]NMEA protocol, “NMEA Protocol,” http:// **aprs.gids.nl/nmea**.

[7]GPS tracking, “GPS Tracking System,” http://**www.eetimes.com/design/communication-design/4210115**.

[8]GPS tracking, “GPS Tracking System,” http:// **tech.in.com/features/all/what-is-agps-how-does it work/115142.**

[9]GPS tracking, “GPS Tracking System,” http:// **webhelp. ersi. com/ arcpad/8. 0/ userguide/ index.htm**

[10]Distance calculation,”Distance Calculatiation” http://**devdiscoveries. wordpress. com/ 2010/ 02/ 01/ android-distance-between-two-points-on-the-earth/**

[11] Jakia Mun, “Study on location based services” http://**hdl.handle.net/10361/781**, 2010.