بسم الله الرحمن الرحيم

Kingdom of Saudi Arabia
Ministry of Higher Education
Jazan University

*Faculty of Computer Science & Information Systems*

**APPROVAL FOR BINDING OF GRADUATION PROJECT REPORT**

**GRADUATION PROJECT (495 – COMP / INFS / CNET- 3)**

**GROUP (CS/IS/CNET) : CS**

**SESSION 2015 / 2016**

***To be filled in by student***

| | | |
|---|---|---|
| Student name(s) | : | Abdulmuhaymin A Zakari - Abdullah A Aqeeli - Shadi A Hakami |
| University ID(s). | : | 201211162 - 201211148 - 201211191 |
| Project title | : | JAZAN UNIVERSITY SMART PARKING SYSTEM(SPS) |

***To be filled in by supervisor****

**This is to certify that the project submitted and presented by the above mentioned student(s) is**

☐ **COMPLETE & ACCEPTED** ☐ **INCOMPLETE** ☐ **NOT ACCEPTED**

**And the draft of graduation project report has been corrected from all content flaws, typing errors and language mistakes.**

Supervisor name : **Dr.Imad Alsheikh**

Signature :

Date :

***NOTE**: The student may proceed with Ring binding ONLY after this section has been completed. The student shall submit three **copies** of Ring bound draft report for Graduation Project to the panel of examiners on the day of final presentation.

***For Departmental Office use only***

Date received :

Signatures availability :

**PREFACE**

**ON**

# SMART PARKING SYSTEM


**JAZAN UNIVERSITY**

**FACULTY OF COMPUTER SCIENCES AND INFORMATION SYSTEM**


**Submitted to the Department of**

**COMPUTER SCINCE AND INFORMATION SYSTEM**

**JAZAN UNIVERSTIY**

**In partial fulfillment of the**

## Bachelor of computer science

Of

## JAZAN UNIVERSITY

(COLLEGE OF COMPUTER SCIENCE&INFORMATION SYSTEM,

JAZANUNIVERSITYJAZAN,

(KSA)(2006-2016)

"Smart Parking System"

**Content**:

# PREFACE

The parking spots have become an issue to the most of the people, either in the big facilities or in the malls etc.

everyone in this time has think a hundred time before he move to visit any place because of the horrible idea "where am I going to park my car" or "does this place contain a free parking spots or do I have to get a taxi".

From this problem and as they say in Arabic, The need is the mother of invention,

We was very excited to produce something in return to our community to solve this problem in to get benefits from the technology that we are having in the meantime.


## ACKNOWLEDGEMENTS

It is my great pleasure to take this opportunity to acknowledge the contribution of a number of people who helped me in completing this project.
I thank the Almighty Allah for give me the ability and courage to do this project.

We express our gratitude to our college,
**College of Computer Science & Information Systems, Jazan University, Jazan** to our beloved **Dean Dr. Mohammed Al-Salem** for providing means for attaining our most cherished goals.

We record our deep sense of gratitude to our project supervisor **Dr.Imad Alsheikh** for his constant motivation, valuable help and guidance throughout the period of project execution.

We also thank all the faculty members of Computer Science College for their help and motivation during our study period.

**Student Name: Abdulmuhaymin A Zakari**

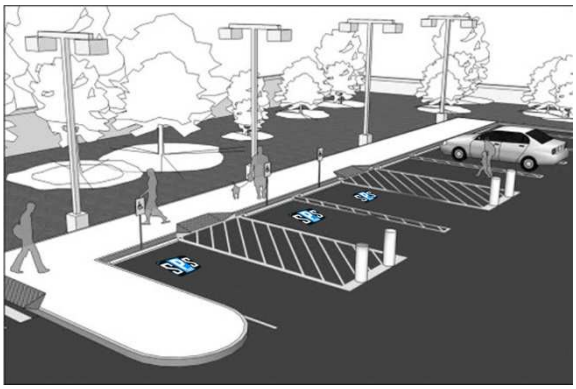
**Student Name: Abdullah A Aqeeli**

**Student Name: Shadi A Hakami**

## ABSTRACT

"Smart Parking System or SPS"

By the help of Allah, we wore able to use Google maps API to get benefits from it and make an implementation for several platform such as World Wide Web and android devices in general, and we wore so close to start our project for IOS users and make them live this lovely story that we have took to produce a great solution for anyone want to get a free parking at the university so fast and so quickly,



"Parking Detector"

A combination of several devices to participate in the system mechanism and data transaction to the server.

Arduino

Arduino is the main environment and that heart of our system and we will see a great introduction about Arduino environment later on.

www.jazanu-sps.com


System logo

JAZANU SPS


Google maps API

SPS or "Smart Parking System" is a great combination of systems in fact, and that including hardware and software technologies and devices, in which we can use to determine if there a car in a specific location or not.
Moreover, using this algorithm, we can let the user know through deferent environments if there a free park that he can park on or not, simple thoughts and big job☺.

## 1. INTRODUCTION

Our system's main goal and objective behind the system is to give the users the ability of seeing all parks status at the university (or every place in the future) wither it is free to park in, or busy by other.

That will save a lot of time and enhance the performance and reliable the final usage of the university in the technologies side, In the meanwhile, everyone in the planet is trying to add the technical support to every aspects of life, ever the simple one of them, have you heard about an app that can close your lamb at night?

### 1.1 Project Goals and Objectives

a) Provide a free park to each member of the university (staff or students) so fast and in a professional way.

b) Save the time and efforts

c) Add a technical touch's to our university

d) Enhance the performance of the transporting plans at the university or any place in the future.

## 1.2 Project Scope:

The project shall consider among other things the following issues:

1. To provide a better understanding of how to get your park so easily.
2. Implementing the system on deferent platforms
3. Take benefits from the Technical Era that we are living in.
4. Provide a new scheme for the organizations in general to help in the parking issue.

## 1.3 Limitations and Constraints

### a. Limitations

Some drawbacks of SPS are as follows:

- It needs a pre setup in any parks.
- It should be connected all the time to the internet.
- It needs a maintenance over time.
- Finally, it needs a full team to handle all the aspects of the project.

### b. Constraints

The following are some constrains in the proposed system:

- Network Connection with an average speed is needed.
- An " Parking detector " on each park spot we have
- Server down leads to the system to be dead.
- The connection should be more then reliable, Arduino or "Parking detector" needs to update its state every 3 seconds.

## 1.4 Assumptions

In the proposed system, the following assumptions are made:

- Administrator can create and handle the server and the clients.
- A full team to work on the project
- The server is already online.

## 2. PREVIOUS WORKS AND LITERATURE REVIEW

Sense we are working on an Arduino project, we should talk about it in a few lines:

What is Arduino?

Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based onWiring), and the Arduino Software (IDE), based on Processing.

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards are completely open-source, empowering users to build them independently and eventually adapt them to their particular needs. Thesoftware, too, is open-source, and it is growing through the contributions of users worldwide.

Why Arduino?

Thanks to its simple and accessible user experience, Arduino has been used in thousands of different projects and applications. The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. It runs on Mac, Windows, and Linux. Teachers and students use it to

build low cost scientific instruments, to prove chemistry and physics principles, or to get started with programming and robotics. Designers and architects build interactive prototypes, musicians and artists use it for installations and to experiment with new musical instruments. Makers, of course, use it to build many of the projects exhibited at the Maker Faire, for example. Arduino is a key tool to learn new things. Anyone - children, hobbyists, artists, programmers - can start tinkering just following the step by step instructions of a kit, or sharing ideas online with other members of the Arduino community.

There are many other microcontrollers and microcontroller platforms available for physical computing. Parallax Basic Stamp, Netmedia's BX-24, Phidgets, MIT's Handyboard, and many others offer similar functionality. All of these tools take the messy details of microcontroller programming and wrap it up in an easy-to-use package. Arduino also simplifies the process of working with microcontrollers, but it offers some advantage for teachers, students, and interested amateurs over other systems:

- Inexpensive - Arduino boards are relatively inexpensive compared to other microcontroller platforms. The least expensive version of the Arduino module can be assembled by hand, and even the pre-assembled Arduino modules cost less than $50
- Cross-platform - The Arduino Software (IDE) runs on Windows, Macintosh OSX, and Linux operating systems. Most microcontroller systems are limited to Windows.
- Simple, clear programming environment - The Arduino Software (IDE) is easy-to-use for beginners, yet flexible enough for advanced users to take advantage of as well. For teachers, it's conveniently based on the Processing programming environment, so students learning to program in that environment will be familiar with how the Arduino IDE works.
- Open source and extensible software - The Arduino software is published as open source tools, available for extension by experienced programmers. The language can be expanded through C++ libraries, and people wanting to understand the technical details can make the leap from Arduino to the AVR C programming language on which it's based. Similarly, you can add AVR-C code directly into your Arduino programs if you want to.
- Open source and extensible hardware - The plans of the Arduino boards are published under a Creative Commons license, so experienced circuit designers can make their own version of the module, extending it and improving it. Even relatively inexperienced users can build the breadboard version of the module in order to understand how it works and save money.

After this introduction, we are so glad to introduce

## "Parking detector"

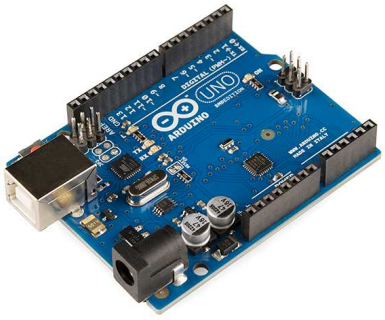
**What is parking detector?**

**It's a combination of several devices by which we can use to detect cars behavior at the parks, and determine if there a car in every specific parking spot or not.**

**To be more detailed, here is some information:**

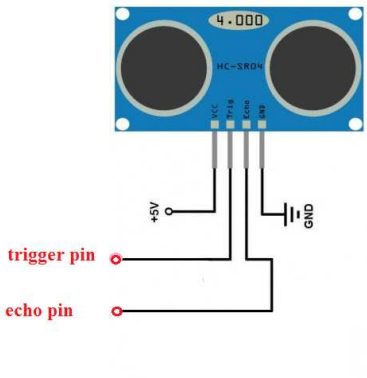
Devices we are using:

1- **Arduino uno**



Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board.

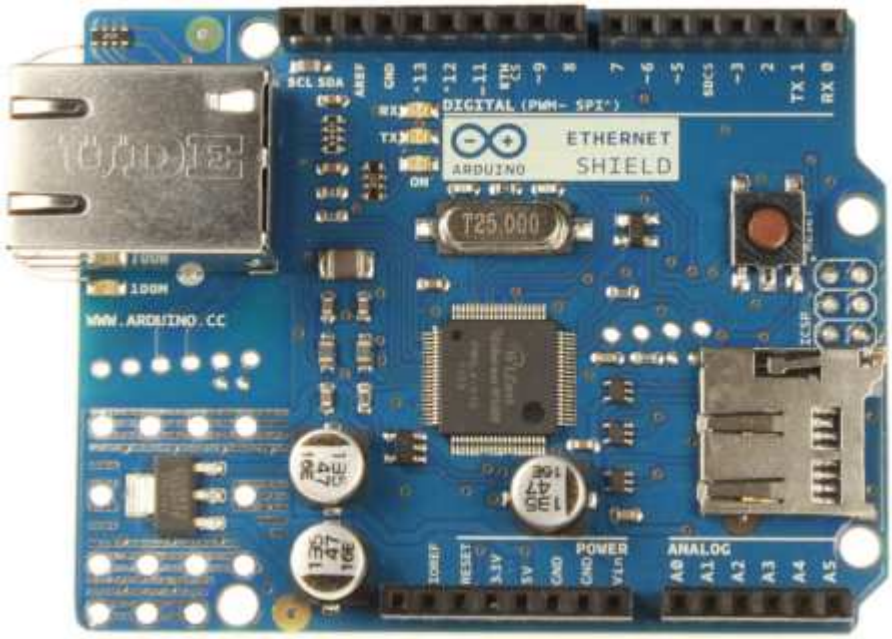
2- **Ultrasonic sensor**




**How It Works**

It emits an ultrasound at 40 000 Hz which travels through the air and if there is an object or obstacle on its path It will bounce back to the module. Considering the travel time and the speed of the sound you can calculate the distance.

**Finally,** Arduino Ethernet Shield**.**




Overview

The Arduino Ethernet Shield connects your Arduino to the internet in mere minutes. Just plug this module onto your Arduino board, connect it to your network with an RJ45 cable (not included) and follow a few simple instructions to start controlling your world through the internet. As always with Arduino, every element of the platform – hardware, software and documentation – is freely available and open-source. This means you can learn exactly how it's made and use its design as the starting point for your own circuits. Hundreds of thousands of Arduino boards are already fueling people's creativity all over the world, every day. Join us now, Arduino is you!

- Requires an Arduino board (not included)
- Operating voltage 5V (supplied from the Arduino Board)
- Ethernet Controller: W5100 with internal 16K buffer
- Connection speed: 10/100Mb
- Connection with Arduino on SPI port

Description

The Arduino Ethernet Shield allows an Arduino board to connect to the internet. It is based on the Wiznet W5100ethernet chip (datasheet). The Wiznet W5100 provides a network (IP) stack capable of both TCP and UDP. It supports up to four simultaneous socket connections. Use the Ethernet library to write sketches which connect to the internet using the shield. The ethernet shield connects to an Arduino board using long wire-wrap headers which extend through the shield. This keeps the pin layout intact and allows another shield to be stacked on top.

The most recent revision of the board exposes the 1.0 pinout on rev 3 of the Arduino UNO board.

The Ethernet Shield has a standard RJ-45 connection, with an integrated line transformer and Power over Ethernet enabled.

There is an onboard micro-SD card slot, which can be used to store files for serving over the network. It is compatible with all the Arduino/Genuino boards. The on-board micro SD card reader is accessible through the SD Library. When working with this library, SS is on Pin 4. The original revision of the shield contained a full-size SD card slot; this is not supported.

The shield also includes a reset controller, to ensure that the W5100 Ethernet module is properly reset on power-up. Previous revisions of the shield were not compatible with the Mega and need to be manually reset after power-up.

Download: arduino-ethernet-shield-06-schematic.pdf, arduino-ethernet-shield-06-reference-design.zip

The current shield has a Power over Ethernet (PoE) module designed to extract power from a conventional twisted pair Category 5 Ethernet cable:

- IEEE802.3af compliant
- Low output ripple and noise (100mVpp)
- Input voltage range 36V to 57V
- Overload and short-circuit protection
- 9V Output
- High efficiency DC/DC converter: typ 75% @ 50% load
- 1500V isolation (input to output)

*NB: the Power over Ethernet module is proprietary hardware not made by Arduino, it is a third party accessory. For more information, see the datasheet*

The shield does not come with the PoE module built in, it is a separate component that must be added on.

Arduino communicates with both the W5100 and SD card using the SPI bus (through the ICSP header). This is on digital pins 10, 11, 12, and 13 on the Uno and pins 50, 51, and 52 on the Mega. On both boards, pin 10 is used to select the W5100 and pin 4 for the SD card. These pins

cannot be used for general I/O. On the Mega, the hardware SS pin, 53, is not used to select either the W5100 or the SD card, but it must be kept as an output or the SPI interface won't work.

Note that because the W5100 and SD card share the SPI bus, only one can be active at a time. If you are using both peripherals in your program, this should be taken care of by the corresponding libraries. If you're not using one of the peripherals in your program, however, you'll need to explicitly deselect it. To do this with the SD card, set pin 4 as an output and write a high to it. For the W5100, set digital pin 10 as a high output.

The shield provides a standard RJ45 ethernet jack.

The reset button on the shield resets both the W5100 and the Arduino board.

The shield contains a number of informational LEDs:

- PWR: indicates that the board and shield are powered
- LINK: indicates the presence of a network link and flashes when the shield transmits or receives data
- FULLD: indicates that the network connection is full duplex
- 100M: indicates the presence of a 100 Mb/s network connection (as opposed to 10 Mb/s)
- RX: flashes when the shield receives data
- TX: flashes when the shield sends data
- COLL: flashes when network collisions are detected

The solder jumper marked "INT" can be connected to allow the Arduino board to receive interrupt-driven notification of events from the W5100, but this is not supported by the Ethernet library. The jumper connects the INT pin of the W5100 to digital pin 2 of the Arduino.

## 3. FEASIBILITY STUDY

### 3.1. Purpose of Feasibility Study:

Feasibility study of the project is the method used to identify the availability of necessary resources for project implementation and marketing of production whether it is profitable or not. To answer this question, the owners of the work of the project feasibility study for the project through the collection of information and its discussion and analysis.

The purpose of the feasibility study is :

a. To see the need of the project and the chances of success.
b. Evidence of the funders that this project is expected to succeed and achieve a good return on investment.
c. Return to learn the material and the restoration of capital
d. To ensure the profitability of the proposed project and its expenses, fixed and variable.

Our system works on the development of a free and new approach of parking idea and it suppose to take the parking systems to the next level

Preliminary investigation examines project feasibility; the likelihood the system will be useful to the organization. The main objective of the feasibility study is to test the Technical, Operational and Economical feasibility for adding new modules and debugging old running system. All systems are feasible if they are given unlimited resources and infinite time.

There are aspects in the feasibility study portion of the preliminary investigation:

- Technical Feasibility
- Operation Feasibility
- Economical Feasibility

## 3.2. Technical Feasibility

The technical issue usually raised during the feasibility stage of the investigation includes the following:

a. Does the necessary technology exist to do what is suggested?
b. Does the proposed equipment have the technical capacity to hold the data required to use the new system?
c. Will the proposed system provide adequate response to inquiries, regardless of the number or location of users?
d. Can the system be upgraded if developed?

Are there technical guarantees of accuracy, reliability, ease of access and data security?

**Front-end and back-end Tools selection**

An important issue for the development of a project is the selection of suitable front-end and back-end tool. When we decided to develop the project, we went through an extensive study to determine the most suitable platform that suits the needs of the organization as well as helps in development of the project.

The aspects of our study included the following factors

**Front-end selection:**

a. It must have a graphical user interface that assists employees that are not from IT background.
b. Scalability and extensibility.
c. Flexibility.
d. Robustness.
e. According to the organization requirement and the culture.
f. Must provide excellent reporting features with good printing support.
g. Platform independent.
h. Easy to debug and maintain.
i. Event driven programming facility.
j. Front end must support some popular back end like SQL server.

According to the above stated features, we selected **NETBEANS 8.1 as** the front-end for developing our project.

**Back-end Selection:**

a. Multiple user support.
b. Efficient data handling.
c. Provide local and public host IP`s
d. Platform independence.
e. Instant messaging.
f. Popularity.
g. Easy to use.
h. Easy to implant with the Front-end.

According to above stated features we selected PHP,mySql as the backend development tool.

The technical feasibility is frequently the most difficult area encountered at this stage. It is essential that the process of analysis and definition be conducted in parallel with an assessment to technical feasibility. It centers on the existing computer system (hardware, software etc.) and to what extent it can support the proposed system.

# 4. PROJECT PLAN

## 4.1. Work Breakdown Structure:

The Work Breakdown Structure (WBS) is a tool that defines a project and groups the project's discrete work elements in a way that helps organize and define the total work scope of the project. A WBS element may be a product, data, a service, or any combination. Breakdown Structure also provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control. Additionally the WBS is a dynamic tool and can be revised and updated as needed by the project manager. Each descending level of the WBS represents an increased level of detailed definition of the project work.

Most project techniques are based on breaking down the goal of the project into several intermediate goals. Each intermediate goal can in turn be broken down further. We can then plan for each goal individually its resource requirement, assignment of responsibility, scheduling etc.

In this technique (WBS), a tree is build whose root is labeled by the major activity of the project like “SPS". This node is broken down into smaller components, which is called children of the node. This work breakdown is repeated until each node of the tree is small enough to estimate its size, resource requirement and difficulties. WBS identifies all the activities that a project must undertake. The work break down structure can also be an input into the scheduling process. There is a difference between work breakdown and scheduling. In work break down structure, we try to decide which task needs to be done, whereas in scheduling, we decide the order in which to do these tasks. Each work item in the WBS is associated with an activity to perform that item.

# 5. SYSTEM REQUIREMENT SPECIFICATIONS

## 5.1. System Requirements Analysis

This document gives an overview of the features for the SMART PARKING SYSTEM. It is a very high-level document covering the broad features planned in the software.

As first step in the analysis of the system, the end user of the proposed system was asked to give firsthand information regarding their needs and wants. The user gives comprehensive information about the difficulties felt by him in doing his work. Ideas from both sides were exchanged in order to get a standard and satisfactory system. Once over all goals were identified, a detailed analysis on the technology is done to make the system functional.

System Requirement Specification (SRS) is the starting point of the software development activity. The objective of analysis of the problem is to answer the question: Exactly what must the system do? During system analysis the analyst attempts to develop a complete functional understanding of the proposed system. The document identifies a number of processes or functions that must be performed by the system.

There are mainly two parts of this phase:

a. Problem Analysis or Requirement Analysis
b. Requirement Specifications and Review

**a. Requirement Analysis Elements Modeling**

We create model to gain a better understanding of the actual entity to be built. Here entity is to be built is software, so it must be capable of modeling the information that the software transforms, the functions and sub-functions that enable the transformation to occur, and the behavior of the system as the transformation is taking place.

**Functional Model**

Software transforms information, and in order to accomplish this, it must perform at least three generic functions: input, processing, and output. The functional mode begins with a single context level model (i.e. the name of the software to be built). Over a series of iterations, more and more functional detail is provided, until a thorough delineation of all system functionality is represented.

**Data Streams Modeling**

large part of what network programs do is simple input and output: moving bytes
from one system to another. Bytes are bytes; to a large extent, reading data a server send you is not all that different from reading a file. Sending text to a client is not that different from writing a

file. However, input and output (I/O) in Java is organized differently than it is in most other languages, such as Fortran, C, and C++. Consequently, I will take a few pages to summarize Java's unique approach to I/O.

I/O in Java is built on streams. Input streams read data; output streams write data. Different stream classes, like java.io.FileInputStream and sun.net.TelnetOutput Stream, read and write particular sources of data. However, all output streams have the same basic methods to write data and all input streams use the same basic methods to read data. After a stream is created, you can often ignore the details of exactly what it is you're reading or writing.

Filter streams can be chained to either an input stream or an output stream. Filters can modify the data as it's read or written—for instance, by encrypting or compressing it—or they can simply provide additional methods for converting the data that's read or written into other formats. For instance, the java.io.DataOutputStream class provides a method that converts an int to four bytes and writes those bytes onto its underlying output stream.

Readers and writers can be chained to input and output streams to allow programs to read and write text (i.e., characters) rather than bytes. Used properly, readers and writers can handle a wide variety of character encodings, including multibyte character sets such as SJIS and UTF-8.

Streams are synchronous; that is, when a program (really a thread) asks a stream to read or write a piece of data, it waits for the data to be read or written before it does anything else. Java also offers nonblocking I/O using channels and buffers. Nonblocking I/O is a little more complicated, but can be much faster in some high-volume applications, such www.it-ebooks.info as web servers. Normally, the basic stream model is all you need and all you should use for clients. Because channels and buffers depend on streams, I'll start with streams and clients and later discuss nonblocking I/O for use with servers in Chapter 11.

Output Streams

Java's basic output class is java.io.OutputStream:

public abstract class OutputStream

This class provides the fundamental methods needed to write data. These are:

public abstract void write(int b) throws IOException

public void write(byte[] data) throws IOException

public void write(byte[] data, int offset, int length)

throws IOException

public void flush() throws IOException

public void close() throws IOException

Subclasses of OutputStream use these methods to write data onto particular media. For instance, a FileOutputStream uses these methods to write data into a file. A

TelnetOutputStream uses these methods to write data onto a network connection. A ByteArrayOutputStream uses these methods to write data into an expandable byte array. But whichever medium you're writing to, you mostly use only these same five methods.Sometimes you may not even know exactly what kind of stream you're writing onto.For instance, you won't find TelnetOutputStream in the Java class library documenta-tion. It's deliberately hidden inside the sun packages. It's returned by various methods in various classes in java.net, like the getOutputStream() method of java.net.Socket. However, these methods are declared to return only OutputStream, not the more specific subclass TelnetOutputStream. That's the power of polymorphism. If you know how to use the superclass, you know how to use all the subclasses, too.

OutputStream's fundamental method is write(int b). This method takes an integer from 0 to 255 as an argument and writes the corresponding byte to the output stream. This method is declared abstract because subclasses need to change it to handle their particular medium. For instance, a ByteArrayOutputStream can implement this meth-od with pure Java code that copies the byte into its array. However, a FileOutput Stream will need to use native code that understands how to write data in files on the host platform.

## 5.2. The Object Model:

Object–oriented technology, built upon a sound engineering foundation whose elements are collectively called the ***object model***. The object model encompasses the principles of abstraction, encapsulation, modularity, hierarchy, concurrency and persistence.

**Object Oriented Programming:**

Object Oriented Programming is a method of implementation in which programs are organized as cooperative collections of objects, each of which represents an instance of some class, and whose classes are all members of a hierarchy of classes united via inheritance relationships**.**

**Object-Oriented Analysis**

Object oriented analysis is a method of analysis that examines requirements from the perspective of the classes and objects found in the vocabulary of the problem domain.

**Object-Oriented Design**

Object Oriented Design is a method of design encompassing the process of object-oriented decomposition and a notation for depicting logical and physical as well as static and dynamic models of the system under design.

**LIMITATIONS OF THE EXISTING SYSTEM**

Since out a project based on google maps api, first we had to ask GOOGLE for permission before we use their features, they agreed and sent us a key to start using it.
Other point is that our project implement many libraries such as jQuery and mySql Connector, so we cannot use it without having a suitable connection to the Internet.

## 5.3. Requirement Analysis

At the heart of system analysis is a detailed understanding of all important facets of business area under investigation. (For this reason, the process of acquiring this is often termed the detailed investigation) Analyst, working closely with the employees and managers, must study the business process to answer these key questions:

What is being done?
How is it being done?
How frequent does it occur?
How great is the volume of transaction or decisions?
How well is the task being performed?
Does a problem exist?
If a problem exists, how serious is it?
If a problem exists, what is the underlying cause?

Requirement analysis relies on fact-finding techniques. These include:

Interview
Questionnaires
Record inspection
On-site observation

The model that is basically being followed is the WATER FALL MODEL, which states that the phases are organized in a linear order. First of all the feasibility study is done. Once that part is over the requirement analysis and project planning begins. If system exists one and modification and addition of new module is needed, analysis of present system can be used as basic model.
The design starts after the requirement analysis is complete and the coding begins after the design is complete. Once the programming is completed, the testing is done.
In this model the sequence of activities performed in a software development project are:

a. Requirement Analysis
b. Project Planning
c. System design

d. Detail design
e. Coding
f. Unit testing
g. System integration & testing

Here the linear ordering of these activities is critical. End of the phase and the output of one phase is the input of other phase. The output of each phase is to be consistent with the overall requirement of the system. Some of the qualities of spiral model are also incorporated like after the people concerned with the project review completion of each of the phase the work done.

WATER FALL MODEL was being chosen because all requirements were known beforehand and the objective of our software development is the computerization/automation of an already existing manual working system.

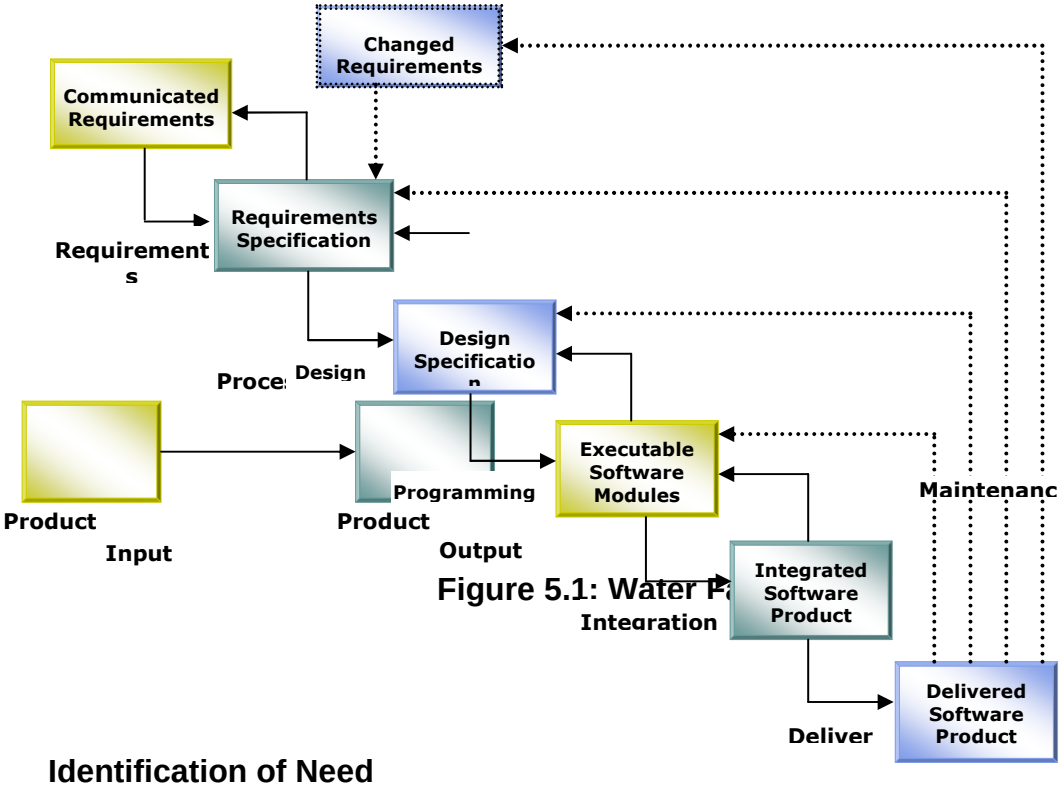



Figure 5.1: Water Fa

**a. Identification of Need**

In the world we are growing for globalization day by day with the development in IT resources and advancement, by using latest technologies every organization wants to beat its competitors and want to grow. Enterprise Resourceful Planning is the need of today's organization. Survival on manual system is difficult so, that's why organization of the corporate world wants to computerize their departments. The modules should be complete database driven and interactive that should provide the proper information about the Placement and Training Organization.

Success of any system depends up to a large extent on how accurately a problem is defined, thoroughly investigated and properly carried out to the choice of solution. Analysis is the only phase in which the requirements for the new system are identified. System analysis is a detailed

study of the various operations performed by a system and their relationship within and outside of the system. The question is: what must be done to solve the problem? One aspect of analysis is defining the boundaries of the system and determining whether or not a candidate system should consider other related system. During analysis data are collected on the available files, decision points and transactions handled by the parent system. Data flow diagram, interviews, onsite observations, questionnaires are used as a logical system model and tools to perform the analysis.

An analyst is responsible for performing following tasks:

a. Gathered all facts about the present system from the employees.
b. Studied strength and weakness of the current system.
c. Determined “what” must be done to solve the problem.
d. Prepared a functional specifications document.

In order to reduce the time, there is a need for computerized system that cans retrieve data, insert data, update existing data or delete existing data. These modules are developed with the aim of reducing time, reducing manpower, reducing cost so that the records can be easily maintained. The volume of work and complexity are increasing year by year. This system reduces complexity and workload.

**b. Preliminary Investigation**

A request to take assistance from information system can be made for many reasons, but in each case someone in the organization initiate the request. When the request is made, the first system activity the preliminary investigation begins. This activity has three parts:

Request clarification
Feasible Study
Request approval

Many requests from employees and users in the organization are not clearly defined. Therefore, it becomes necessary that project request must be examined and clarified properly before considering systems investigation.

The feasibility study is carried out by a small group of people who are familiar with information system techniques, understand the parts of the business or organization that will be involved or affected by the project, and are skilled in the system analysis and design process.

### c. Strategy to Gather Information

Gathering information in large organization is difficult and takes time. All relevant personal should be consulted and no information should be overloaded. The strategy consists of:

Identify information sources.

Evolving a method of obtaining information from identified source.

Using an information flow model of organization.

### d. Information Sources

The main sources of information for the systems developing are:

User of the system.

Forms and documents used in the organization.

Procedure manuals and rulebooks, which specify how various activities, are carried in the organization.

Various reports used in the organization.

## 5.4. Method of searching for information

Information gathering first starts with conversation with top-level management. An overview of organization, available information and objective to be met for the proposed worked out and verified. For collecting quantitative data from number of person in organization, questionnaires are useful. The primary purpose of interview is to obtain both quantitative and qualitative data (system are manually gathered from the top management. A gross system model is then current as well as desired data).

**<u>While interviewing keeping some point in mind.</u>**

Make a prior appointment with the person to be interviewed.

Read the background material and prepare the reports with checklist.

State again the purpose of the interview at the beginning of interview.

Obtain permission to take notes.

Don’t use computer jargon.

Try to obtain both qualitative and quantitative information.

Summarize the information gathered during the interview and verifying by user.

**Other method of information searching: -**

- ✓ System used in other similar organization
- ✓ Trade journals and reports of conferences describing similar system.

## 5.5. Acceptance Criteria

The following acceptance criteria were established for evaluation of the new system: -

a. The system developed should be accurate and hence reliable i.e. the error rate should be minimized and the output should be accurate and consistent.
b. The developed software should provide all the functions. Further, the execution time should be very low and response should be good.
c. It should satisfy the criteria specified in functional and performance requirements.
d. The system should have scope to foreseen modifications and enhancements i.e. it should be able to cope up with changes.

The system must satisfy the standards of good software, i.e.: -

a. User Friendliness
b. The system should satisfy the user’s need. It should be easy to learn and operate.
c. Modularity
d. The system should have relatively independent and single function parts that can be put together to make complete system.
e. Maintainability
f. The development system should be such that the time and effort for program maintenance and enhancement is reduced.
g. Timeliness
h. The system should operate well under normal peak and recovery conditions.

## 5.6. Request for Approval:

It is not necessary that all request projects are desirable or feasible. Some organizations receive so many projects request from employees that only a few of them can be purchased. However, those projects that are feasible and desirable should be put into a schedule.

In some cases, development can start immediately, although usually system staff members are busy on other ongoing projects. When such situation arises, management decides which projects are more urgent and schedule them accordingly. After a project request is approved, its cost, priority, completion time and personal requirements are estimated and used to determine where to add it to any existing project list. Later on, when the other projects have been completed, the proposed application development can be initiated.

Analysis is a process of studying a problem and to find the best solution to that problem. System analysis gives us the target for the design and the implementation. Analysis is one phase, which is important phase for system development lie cycle. System development is a problem solving techniques. Analysis involves interviewing the client and the user. Three people and the existing documents about the current mode of operation are the basic source of information for the analyst.

Analysis is the process of studying a problem to find the best solution to that problem. System analysis gives us the target for the design and the implementation. Analysis is one phase of the very important phase of the system development life cycle. System development is a problem solving techniques. Analyses involve interviewing the client and the user. These people and the existing document about the current mode of operation are the basic source of information for the analyst.

Human Resource Department of the organization controls the manpower planning by recording manpower requirements, grade, job specifications and presently vacancies and strength. It maintains the candidate's databank for the respective post.

## 5.7. Software Engineering Paradigm

Computer Aided Software Engineering can be as simple as a single tool that support a specific software engineering activity or as complex as a complete "environment" that encompasses tools, a database, people, hardware, a network, operating system, standards, and myriad other components. Each building block forms a foundation for the next, with tools sitting as the top of the heap. It is interesting to note that the foundation for effective CASE environment has relatively little to do for software engineering tools themselves. Rather, successful environments appropriate hardware and systems software. In addition, the environment architecture must consider the human work patterns that are applied during the software engineering process.

The environment composed of the hardware platform and system support (including networking software, software management, and object management services), the groundwork for CASE. But the CASE environment itself demands other building blocks. A set of portability services provides a bridge between CASE tools and their integration framework and the environment architecture. The integration framework is a collection of specialized programs that enables individual's CASE tools to communicate one another, to create a project database, and to exhibit the same look and feel to the end user (the software engineer). Portability services allow CASE tools and their integration framework to migrate across different hardware platforms and operating system without significant adaptive maintenance.

The building blocks represent a comprehensive foundation for the integration of CASE tools. However, most CASE tools in use today have been: constructed using all these building blocks.

In fact some CASE tools remain "point solution:" That is, a tool is used to assist in a particular software engineering activity (e.g. analysis modeling) but does not directly communicate with other tools, is not tied into a project database, is not part of an integrated CASE environment (I-CASE). Although this situation is not ideal, a CASE tool can be used quite effectively, even if it is a point solution.

At the low end of the integration spectrum is the individual (point solution) tool. When individual tools can provide tools provide facilities for data exchange, the integration level is improved slightly. Such tools produce output in a standard format that should be compatible with other tools that can read the format. In some cases, the builder of complementary CASE tools work together to form a bridge between the tools (e.g. an analysis and design tool that is coupled with a code generator). Using this approach, the team developed, synergy between the tools separately. Single source integration occurs when a single CASE tools vendor integrates a number of different tools and sells them as a package.

Although this approach is quite effective, the closed architecture of most single source environments precludes easy addition from other vendors.

## 5.8. Hardware and Software Requirements

**Hardware requirements:**

- Intel PIV 3.0 GHz Processor and Above
- RAM 2 GB and Above
- HDD 128 GB Hard Disk Space and Above
- Any android device

**Software requirements:**

- WINDOWS Operating System (XP / 2000 / Vista/Windows 7 or above)
- Android 4.0 and above

# 6. SYSTEM DESIGN

## 6.1. Introduction

Design is a meaningful engineering representation of something that is to be built. It can be traced to a customer's requirements and at the same time assessed for quality against a set of predefined criteria for 'good' design. In the software engineering context, design focuses on four major areas of concern, data, architecture, interfaces, and components.

Design is a process of refining product definition and solutions to a sufficient detailed that a physical implementation becomes possible.

Information (data flow and relationships among the data), functional (function and process specifications) and behavioral (state descriptions, events, etc.) models and other requirements are fed to the "Design" process to produce:

- ✓ Architectural Design
- ✓ Data Design: Global and Detailed
- ✓ Procedural Design: Global and Detailed
- ✓ Interface Design
- ✓ Design process usually includes two phases: global and detailed design
- ✓ Designs are "Implemented" as code, files, data- bases, etc

## 6.2. General software design principles

- **Correct & complete:** The design should correctly implement a specification.
- **Maximize Cohesion:** Cohesion describes how well the contents of a module cohere (stick together). A component should implement a single logical function or should implement a single logical entity.
- **Minimize Coupling:** Coupling describes how modules interact. Systems should be loosely coupled. Highly coupled systems have strong interconnections with units dependent on each other. Loosely coupled systems are made up of components, which are independent or almost independent.
- **Understandability:** A design must be understandable if it is to support modification.
- **Adaptability:** The design must be easy to change.

## 6.3. Design Fundamentals

Three distinctive aspects of an information system are addressed during its software design. Data design is involved with the organization, access methods, associatively, and processing alternatives of the system's data. Architectural (preliminary) design defines the components, or modules, of the system and the relationships that exist between them. Procedural (detailed) design uses the products of the data and architectural design phases to describe the processing details of the system -- module internals. Software design methods attempt to aid the designer in each of these three aspects; they assist in partitioning the software into smaller components and reducing complexity; they help to identify and isolate data structures and functions; and they attempt to provide some measure of software quality.

Regardless of its specifics, every software design method that has been introduced to the software engineering community is based to some extent on the same proven concepts, and shares common characteristics (Pressman, 1987). They each aid the designer by providing the following:

- **a.** A mechanism translating the physical problem to its design representation.
- **b.** A notation for representing functional components and their interfaces.
- **c.** Heuristics for refinement and partitioning.
- **d.** Guidelines for quality assessment.

Fundamental concepts that have remained fairly constant, although the degree to which they are stressed varies considerably, are stepwise refinement, software architecture, program structure, data structure, software procedure, modularity, abstraction, and information hiding.

### 6.3.1 Overview of Design Methods

Each software design method has as its goal to provide the software designer with a blueprint from which a reliable system may be built. This section covers the nature of software design in more detail. It defines the fundamentals which software design should adhere to, design's role as a representational model, and a historic perspective on design.

## 6.4. Stepwise Refinement

Stepwise refinement is a top-down approach where a program is refined as a hierarchy of increasing levels of detail. This process may be begun during requirements analysis and conclude when the detail of the design is sufficient for conversion into code. Processing procedures and data structures are likely to be refined in parallel.

## 6.5. Abstraction

Abstraction is a means of describing a program function, at an appropriate level of detail. At the highest level of abstraction a solution is stated in the language of the problem environment (requirements analysis). At the lowest level of abstraction, implementation-oriented terminology is

used (programming). An abstraction can be compared to a model, which incorporates detail only to the extent needed to fulfill its purpose.

## 6.6. Software Architecture

While refinement is about the level of detail, architecture is about structure. The architecture of the procedural and data elements of a design represents a software solution for the real-world problem defined by the requirements analysis. It is unlikely that there will be one obvious candidate architecture.

## 6.7. Program Structure

The program structure represents the hierarchy of control. Program structure is usually expressed as a simple hierarchy showing super-ordinate and subordinate relationships of modules.

## 6.8. Data Structure

Data structure represents the organization, access method, associatively, and processing alternatives for problem-related information. Classic data structures include scalar, sequential, linked-list, n-dimensional, and hierarchical. Data structure, along with program structure, makes up the software architecture.

## 6.9. Modularity

software design that allows complex software to be manageable for purposes of implementation and maintenance. The logic of partitioning may be based on related functions, implementation considerations, data links, or other criteria. Modularity does imply interface overhead related to information exchange between modules and execution of modules.

## 6.10. Software Procedure

Software procedure provides a precise specification of the software processing, including sequence of events, exact decision points, repetitive operations, and data organization. Processing defined for each module must include references to all subordinate modules identified by the program structure.

## 6.11. Information Hiding

Information hiding is an adjunct of modularity. It permits modules to be designed and coded without concern for the internals of other modules. Only the access protocols of a module need to be shared with the implementers of other modules. Information hiding simplifies testing and modification by localizing these activities to individual modules.

## 6.12. Application Architecture Design:-

### a. Introduction

System design provides the understandings and procedural details necessary for implementing the system recommended in the system study. Emphasis is on the translating the performance requirements into design specifications. The design phase is a transition from a user-oriented document (System proposal) to a document oriented to the programmers or database personnel.
System design goes through two phases of development:

- **Logical Design**
- **Physical Design**

A data flow diagram shows the logical flow of the system. For a system it describes the input (source), output (destination), database (data stores) and procedures (data flows) all in a format that meets the user's requirement. When analysis prepares the logical system design, they specify the user needs at a level of detail that virtually determines the information flow into an out of the system and the required data resources. The logical design also specifies input forms and screen layouts.
The activities following logical design are the procedure followed in the physical design e.g., producing programs, software, file and a working system. Design specifications instruct the user about what the system should do.

**Logical and Output Design:**

The logical design of an information system is analogous to an engineering blue print of an automobile. It shows the major features and how they are related to one another. The detailed specification for the new system was drawn on the bases of user's requirement data. The outputs inputs and databases are designed in this phase.
Output design is one of the most important features of the information system. When the outputs is not of good quality the users will be averse to use the newly designed system and may not use the system. There are many types of output, all of which can be either highly useful or can be critical to the users, depending on the manner and degree to which they are used.
Outputs from computer system are required primarily to communicate the results of processing to users; they are also used to provide a permanent hard copy of these results for later consultation.
Various types of outputs required can be listed as below:
External Outputs, whose destination is outside the organization internal outputs, whose destination is with the organization Operational outputs, whose use is purely within the department e.g., daily booking-list etc.
Interactive outputs, which involve the user is communicating directly with the computer, it is particularly important to consider human factor when designing computer outputs. End user must find outputs easy to use and useful to their jobs, without quality output, user may find the entire

system unnecessary and avoid using it. The term “Output” in any information system may apply to either printer or displayed information. During the designing the output for this system, it was taken into consideration, whether the information to be presented in the form of query of report or to create documents etc.

Other important factors that were taken into consideration are:

- The End user, who will use the output.
- The actual usage of the planned information
- The information that is necessary for presentation

When and how often output and their format is needed. While designing output for project based Vehicle Hiring System, the following aspects of outputs designing were taken into consideration.

- The outputs (i.e., well formatted table outputs in the screen itself) designed are simple to read and interpret.
- Format of each output was another important point taken into consideration. Output media, for each output appropriate media is decided whether it will be displayed on screen or will be taken to printer or both.
- Other output design related specifications, i.e., how frequently the outputs will be generated, how many pages or sheets approximately it will keep up, what is its planned use and output distribution to users are also taken into account.

These were a few major designing issues, which were taken into consideration, while deciding the output specifications for the system. As direct beneficiary of reports is the user community, they were consulted constantly at every level. Formats and screen design for various reports were identified, taking into account the user requirements. Before finalizing these were given to users for any improvement and suggestions. End users issues taken into consideration were Readability, Relevance and Acceptability.

Once all the output reports to be generated by Vehicle Hiring system were identified, they were given to users for their acceptance. For prototyping various outputs, final outputs models were created with dummy data, before they were finalised.

**Output Sources:**

Output contents originate from these sources:

- Retrieval from a data source.
- Transmission from a process or system activity.
- Directly from an input source.
- The information produced in an output can be presented as
- Tabular contents
- Graphic format
- Using Icons

**Output Definition:**

The output should be defined in terms of:

**Types of outputs**

- Content-headings, numeric, alphanumeric, etc.,
- Format-hardcopy, screen, microfilm, etc.,
- Location-local, remote, transmitted, etc.,
- Frequency-daily, weekly, hourly, etc.,
- Response-immediate with in a period, etc.,

**Data items**

The name given to each data item should be recorded and its characteristics described clearly in a standard form:

- Whether alphanumeric or numeric
- Legitimate and specific range of characteristics
- Number of characters
- Positions of decimal point, arithmetic design, etc.,

**Input Design:**

The input design is the link that ties the information system into the user's world. Input specifications describe the manner in which data enters the system for processing. Input design features can ensure the reliability of the system and produce results from accurate data, or they can result in the production of erroneous information.

Input Design consists of developing specifications and procedures for data preparation

- Steps necessary to put data into a usable form for processing.
- Data entry, the activity of putting data into the computer processing.

Objectives of Input design

Five objectives of design input focus on

- Controlling the amount of input required
- Avoid delay
- Avoiding errors in data
- Avoiding extra steps.
- Keeping the process simple.

Input stages several activities have to be carried out as part of trover all input process. They include some or all of the following.

- Data recording (i.e., collection of data)

- Data encapsulation(i.e. transfer of data)
- Data conversion(i.e. controlling the flow of data)
- Data transmission(i.e. transporting the data)
- Data validation(i.e. checking the input data)
- Data correction(i.e. correcting the errors)

Input Performa were designed, after a careful discussion with users. It was attempted to cover all user requirements. Designed Performa were given to user for any suggestion and final approval.
Various data items were identified and wherever necessary were recorded.
Input designs are aimed at reducing the chances of mistakes of errors. As the human beings are prone to errors there is always a possibility of occurrence of chance of errors. Adequate validation checks are incorporated to ensure error free data storage. Some of the data validation checks applied are as following:

- Redundancy of data is checked. It means the records of primary key do not occur twice.
- Primary key field of any table must not be left blank.
- Wherever items are coded, input code is checked for it's validly with respect to several checks.

Utmost care has been taken to incorporate the validation at each stage of the system. e.g. when entering records into employee information table for employee, it is checked that whether the corresponding employee exists in the employee information table etc.
Enough messages and dialogue boxes are provided while design screen, which does guide user at the time of any errors, or at time of entry. This feature provides a user-friendly interface to native users.

**Software Design**

The purpose of this phase is to plan a solution for the problem specified by the requirement document. This is first step in moving from the problem domain to solution domain. Designing activity is divided into two parts.

**a) System Design**

It aims to identify the modules that should be in the system, the specification of these modules and how they interact with each other to produce the desired result.

**b) Detailed Design**

The internal goal of each of the modules specified in the system design is decided.

## 6.13. Code Design

The process of code is to facilitate the identification and retrieve of items of information. The code should be simple and easy to understandable. The codes were designed in such a way that the features such as optimum human – oriented use and machine efficiency are unaffected.
For the code to be designed effectively, the following characteristics were also considered while designing the code.

- Uniqueness
- Versatility
- Stability
- Simplicity
- Consciousness

The code should be adequate for present and anticipated data processing for machine and human use.

Arduino IDE

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software. This software can be used with any Arduino board.

**Arduino environment Design:**

**We are going to review the code that our parking detector device is going to perform**

```
#include <Ethernet2.h>
#include<SPI.h>
#include <MySQL_Connection.h>
#include <MySQL_Cursor.h>

byte mac_addr[] = { 0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED };


IPAddress server_addr(54,247,107,148);
char user[] = "sql2105932";
char password[] = "nY9%tF2!";
```

```
char INSERT_SQL[74];
String av="UPDATE `sql2105932`.`Site` SET `availability` = '1' WHERE `Site`.`ID` =1;";
String nav="UPDATE `sql2105932`.`Site` SET `availability` = '0' WHERE `Site`.`ID` =1;";
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;
long duration, distanceCm,Nduration, NdistanceCm;

EthernetClient client;
MySQL_Connection conn((Client *)&client);

void setup() {
  pinMode(TRIG_PIN,OUTPUT);
  pinMode(ECHO_PIN,INPUT);
  Serial.begin(115200);
  while (!Serial); // wait for serial port to connect
  Ethernet.begin(mac_addr);
  Serial.print("IP = ");
  Serial.println(Ethernet.localIP());
  Serial.println("Connecting...");
  if (conn.connect(server_addr, 3306, user, password)) {
    delay(1000);
  }
  else{
    Serial.println("Connection failed.");
    delay(5000);
    setup();
  }
}

void loop() {
  delay(3000);
  digitalWrite(TRIG_PIN, LOW);
  delayMicroseconds(2);
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);
```

```
duration = pulseIn(ECHO_PIN,HIGH);

// convert the time into a distance
distanceCm = duration / 29.1 / 2 ;
Serial.println(distanceCm);



if (distanceCm > 50){
  Serial.println("distance value is more then 50 !");
  for(int i=0;i<sizeof(INSERT_SQL);i++){
  INSERT_SQL[i]=av.charAt(i);
  Serial.print(INSERT_SQL[i]);
  }
  Serial.println("");
}


else if(distanceCm<0){
  Serial.println("distance is in negative value !");
  for(int i=0;i<sizeof(INSERT_SQL);i++){
  INSERT_SQL[i]=av.charAt(i);
  Serial.print(INSERT_SQL[i]);
  }
  Serial.println("");

}

else {
 if(distanceCm==5||distanceCm==6){

   digitalWrite(TRIG_PIN, LOW);
   delayMicroseconds(2);
   digitalWrite(TRIG_PIN, HIGH);
   delayMicroseconds(10);
   digitalWrite(TRIG_PIN, LOW);
```

```
  duration = pulseIn(ECHO_PIN,HIGH);

  // convert the time into a distance
  distanceCm = duration / 29.1 / 2 ;
  Serial.println(distanceCm);
  if(distanceCm>3000){

   Serial.println("distance value is more then 50 !");
   for(int i=0;i<sizeof(INSERT_SQL);i++){
   INSERT_SQL[i]=av.charAt(i);
   Serial.print(INSERT_SQL[i]);
   }
   Serial.println("");

  }
  else{
  Serial.println("park is busy");
 for(int i=0;i<sizeof(INSERT_SQL);i++){
 INSERT_SQL[i]=nav.charAt(i);
 Serial.print(INSERT_SQL[i]);
 }
 Serial.println("");
  }

}
else{
  Serial.println("park is busy");
 for(int i=0;i<sizeof(INSERT_SQL);i++){
 INSERT_SQL[i]=nav.charAt(i);
 Serial.print(INSERT_SQL[i]);
 }
 Serial.println("");
}


}
```

```
 MySQL_Cursor *cur_mem = new MySQL_Cursor(&conn);
cur_mem->execute(INSERT_SQL);
delete cur_mem;

}
```

**mySql database handling**

| ID | availability | lng | lat | description |
|---|---|---|---|---|
| 1 | 0 | 16.963777 | 42.548664 | students parking |
| 2 | 1 | 16.963273 | 42.547192 | staff parking |

**Database sql2105932**

**Table structure for table Site**

| Column | Type | Null | Default |
|---|---|---|---|
| ***ID*** | int(11) | No | 0 |
| availability | int(11) | No | |
| lng | double | No | |
| lat | double | No | |
| description | text | No | |

**Dumping data for table Site**

1 1 16.963777 42.548664 students parking

2 1 16.961734 42.546019 students parking

3 1 16.963273 42.547192 staff parking

**Table structure for table Site**

| Column | Type | Null | Default |
|---|---|---|---|
| ***ID*** | int(11) | No | 0 |
| availability | int(11) | No | |
| lng | double | No | |
| lat | double | No | |
| description | text | No | |

In addition, as we sow previously, the table contains four main columns as the following

Id

Every parking detector unit must have unique id to be reference in the updating statements.

Availability

Represents wither the parking spot is empty on not

Lat,lat

Represent the longitude and the latitude on that parking to recognized by the different interfaces.

First user interaction method

World Wide Web:

We made a small website that the user can use to get his acknowledgement from the system

Let us have a look on the code

In addition, we are going to start with the html file

```
<!DOCTYPE html>
<html>
   <head>
      <title>Jazan University SPS</title>
```

```
    <meta name="description" content="Find your free park at Jazan university in a few seconds." />
    <meta name="keywords" content="jazan university jazan jazanu jazan parking system smart parking system sps jazan sps jazanu-sps jazu sps" />
    <link rel="shortcut icon" type="image/png"  href="image/ic_launcher.png" />
    <link rel="stylesheet" type="text/css" href="style/newCascadeStyleSheet.css">
    <link rel="stylesheet" type="text/css" media="only screen and (max-width: 480px), only screen and (max-device-width: 480px)" href="style/newCascadeStyleSheet1.css" />
    <script type="text/javascript" src="http://maps.googleapis.com/maps/api/js"></script>
    <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.11.2/jquery.min.js"></script>
    <script type="text/javascript"  src='script/newjavascript.js'></script>



  </head>
  <body>
    <div id="mobileDiv" class="invisible">
      <img src="image/XButton.png" id="XApp" onclick="removeMobileDiv()">
      <h1 id="appH1">Have You Tried Our App ?!</h1>
      <img id="applogo" src="image/spsLogo.png">
      <a
href="https://play.google.com/store/apps/details?id=www.jazanu_sps.com.myapplication&utm_source=global_co&utm_medium=prtnr&utm_content=Mar2515&utm_campaign=PartBadge&pcampaignid=MKT-AC-global-none-all-co-pr-py-PartBadges-Oct1515-1"><img id="googleImg" alt="Get it on Google Play" src="https://play.google.com/intl/en_us/badges/images/apps/en-play-badge-border.png" /></a>


    </div>

    <div id="header">
      <img id="logo"  src="image/spsLogo.png">
      <img id="menuB"  onclick="menuFunction()"  src="image/menuButton.png">
      <img id="refreshB" onclick="refresh()" src="image/refresh.png">

    </div>
```

```
        <div id="lefty"  >
            <div id="leftyContent" class="invisible">
                <img id="aboutLogo"  src="image/spsLogo.png">
                <div id="centerDiv">

                    <h1 id="aboutParagraph">
                        SPS stands for "Smart Parking System",It's a graduation project for a bunch of computer science students at JAZAN UNIVERSITY, Contact us at the following E-mail:<br>
201211162@jazanu-sps.com

                    </h1>
                </div>
            </div>


        </div>
        <p id="myp"  class="invisible"  >sorry, non left :'(</p>


        <div id="map" ></div>

        <img id="loading" class="Center"  src="image/loadingN.gif">


    </body>
</html>
```

**Secondly, the style files**

```
@font-face {
    font-family: hw_font;
    src: url(ghoo.ttf);
```

```
    /*local font in style folder, hand writing font */
}

html, body {
    height: 100%;
    margin: 0;
    padding: 0;
}
#map {
    height: 100%;



}

* {
    font-family: hw_font;

    }
#mobileDiv{
    padding: 0;
    margin: 0;
    position: absolute;
    height: 100%;
    width: 100%;
    background-color:  #2b2b2b;
    z-index: 10;
    opacity: 0.9;



}
#applogo{
    width: 50%;
    max-width:500px;
    position: absolute;
    bottom:0; left: 0; right:0;top: 35%;
    margin-bottom:  auto;
```

```
    margin-left: auto;
    margin-right: auto;


}


#appH1{
    width: 100%;
    color: whitesmoke;
    text-align: center;
    position: absolute;
    bottom:0; left: 0; right:0;top:20%;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;
    margin-top: auto;
    font-size: 50px;

}
#XApp{
    width: 20%;
    max-width: 100px;
    float: right;
    margin-right: 5%;
    margin-top: 5%;




}
#googleImg{
    position: absolute;
    bottom:0; left: 0; right:0;top:70%;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;
```

```
    width: 50%;

}

#lefty{
    opacity: 0.7;
    position: absolute;
    background-color: darkslategrey;
    z-index: 3;
    width: 100%;

}
#aboutParagraph{

    color: whitesmoke;
    text-align: center;

}
#centerDiv{

    bottom:0; left: 0; right:0;top: 0;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;
    margin-top: 30%;
    width:70%;
    background-color: darkslategray;
    opacity: 0.8;

}
#aboutLogo{
    position: absolute;
    bottom:0; left: 0; right:0;top: 0;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;
```

```
    margin-top: 5%;
    width: 30%;
}
#leftyContent{
    position: absolute;
    bottom:0; left: 0; right:0;top:10%;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;
    margin-top: auto;


    width: 90%;
    height: 80%;
}
#menuB:hover{
    opacity: 1;

}

#menuB{
    opacity: .8;
    position: absolute;
    bottom:0; left: 15px; right:0;top: 0;
    margin-bottom:  auto;
    margin-right: auto;
    margin-top: auto;
    width: auto;
    height: 50%;
}

#refreshB:hover{
    opacity: 1;

}
```

```
#refreshB{
    opacity: .8;
    position: absolute;
    bottom:0; left: 0; right:15px;;top: 0;
    margin-bottom:  auto;
    margin-left: auto;
    margin-top: auto;
    width: auto;
    height: 50%;
}
.RAnim{
    -webkit-animation-name: RAnim; /* Chrome, Safari, Opera */
    -webkit-animation-duration: 1s; /* Chrome, Safari, Opera */
    animation-name: RAnim;
    animation-duration: 1s;
}
@-webkit-keyframes RAnim {
    from {}
    to {
        -ms-transform: rotate(360deg); /* IE 9 */
        -webkit-transform: rotate(360deg); /* Chrome, Safari, Opera */
        transform: rotate(360deg);}
}

/* Standard syntax */
@keyframes RAnim {
    from {}
    to {
        -ms-transform: rotate(360deg); /* IE 9 */
        -webkit-transform: rotate(360deg); /* Chrome, Safari, Opera */
        transform: rotate(360deg);}
}

.BAnimation{
    -webkit-animation-name: example2; /* Chrome, Safari, Opera */
```

```
    -webkit-animation-duration: 1s; /* Chrome, Safari, Opera */
    animation-name: example2;
    animation-duration: 1s;

}
@-webkit-keyframes example2 {
    from {}
    to {top: 1200%;
        -ms-transform: rotate(360deg); /* IE 9 */
        -webkit-transform: rotate(360deg); /* Chrome, Safari, Opera */
        transform: rotate(360deg);}
}

/* Standard syntax */
@keyframes example2 {
    from {}
    to {top: 1200%;
        -ms-transform: rotate(360deg); /* IE 9 */
        -webkit-transform: rotate(360deg); /* Chrome, Safari, Opera */
        transform: rotate(360deg);}
}
.BAnimation2{
    -webkit-animation-name: example3; /* Chrome, Safari, Opera */
    -webkit-animation-duration: 1s; /* Chrome, Safari, Opera */
    animation-name: example3;
    animation-duration: 1s;

}
@-webkit-keyframes example3 {
    from {}
    to {top:0;
        -ms-transform: rotate(-360deg); /* IE 9 */
        -webkit-transform: rotate(-360deg); /* Chrome, Safari, Opera */
        transform: rotate(-360deg);}
}
```

```
/* Standard syntax */
@keyframes example3 {
    from {}
    to {top:0;
        -ms-transform: rotate(-360deg); /* IE 9 */
        -webkit-transform: rotate(-360deg); /* Chrome, Safari, Opera */
        transform: rotate(-360deg);}
}
.menuAnimation{

    -webkit-animation-name: example; /* Chrome, Safari, Opera */
    -webkit-animation-duration: 1s; /* Chrome, Safari, Opera */
    animation-name: example;
    animation-duration: 1s;
}

@-webkit-keyframes example {
    from {height : 0%;}
    to {height:  100%;}
}

/* Standard syntax */
@keyframes example {
    from {height : 0%;}
    to {height:  100%;}
}
.menuAnimation2{

    -webkit-animation-name: example4; /* Chrome, Safari, Opera */
    -webkit-animation-duration: 1s; /* Chrome, Safari, Opera */
    animation-name: example4;
    animation-duration: 1s;

}

@-webkit-keyframes example4 {
```

```
    from {height :100%;}
    to {height:  0%;}
}

/* Standard syntax */
@keyframes example4 {
    from {height : 100%;}
    to {height:  0%;}
}
#header{
    width: 100%;
    margin: 0; padding: 0;
    background-color:   #002b2e;
    z-index:5 ;
    height:70px;
    position: absolute;

}



#logo{

    position: absolute;
    bottom:0; left: 0; right:0;top: 0;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;
    margin-top: auto;
    width: auto;
    height: 80%;

}
#myp{
    position: absolute;
    bottom:0; left: 0; right:0;
    margin-bottom:  auto;
```

```
    margin-left: auto;
    margin-right: auto;

    height: fit-content;
    text-align: center;
    background-color:  darkred;
    color: white;
    font-size: 40px;
    width: fit-content;
    padding-top:   10px;
    padding-bottom:    10px;
    padding-left: 20px;
    padding-right:  20px;
    top: 7%;
    z-index: 1;
    opacity: .8;
    border-radius:10px;
}

#loading{

    top:25%;
    background-color: white;

    z-index: 1;
    opacity: 0.8;
    border-radius: 50px;
}

a:link {
    color: darkslategray;
}

/* visited link */
a:visited {
    color: darkslategray;
```

```
}

/* mouse over link */
a:hover {
    color: black;
}

/* selected link */
a:active {
    color: darkslategray;
}
a{
    text-decoration: none;
}



.Center{
    position: absolute;
    bottom:0; left: 0; right:0;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;

}
.invisible{
    display: none;
}
.visible{
    display: inline;
}
```

And the mobile version :

```
html, body { height: 100%; margin: 0; padding: 0; }
#map { height: 100%;



}
#header{
    width: 100%;
    height:10%;
    margin: 0; padding: 0;
    background-color:  darkslategrey;
    z-index: 4;

    position: absolute;

}

#mobileDiv{
    z-index: 7;
}



#logo{

    position: absolute;
    bottom:0; left: 0; right:0;top: 0;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;
    margin-top: auto;

    width: auto;
    height: 80%;;

}
```

```
#myp{
    position: absolute;
    bottom:0; left: 0; right:0;top: 12%;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;
    font-size:larger;

    width: 100%;
    height:7%;
    margin: 0; padding: 0;
    background-color:  darkred;
    color: white;
    z-index: 1;

    position: absolute;
    text-align: center;



}
#aboutParagraph{

    color: whitesmoke;
    text-align: center;
    font-size: 40px;

}
.Space{
    margin: 500px;
}
#loading{

    position: absolute;
    bottom:0; left: 0; right:0;top: 30%;
    margin-bottom:  auto;
    margin-left: auto;
```

```
    margin-right: auto;


    width: 100%;

    margin: 0; padding: 0;

    color: white;
    z-index: 1;

    position: absolute;
    text-align: center;
}
.Center{
    position: absolute;
    bottom:0; left: 0; right:0;
    margin-bottom:  auto;
    margin-left: auto;
    margin-right: auto;

}
.invisible{
    display: none;
}
.visible{
    display: inline;
}
```

The server files that we are using php to speak with:

```
<?php

$db_hostname = 'sql2.freemysqlhosting.net';
$db_database = "sql2105932";
$db_username = "sql2105932";
```

```
$db_password = "nY9%tF2!";

$conn = new mysqli($db_hostname, $db_username, $db_password, $db_database);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

function sanitizeMYSQL($conn, $var) {

    return $var;
}

if (isset($_POST["type"])) {
    $type =  $_POST["type"];

    $returned_value = ""; //default value

    switch ($type) {
        case "tasks":
            $returned_value = display_tasks($conn);
            break;
    }

    echo $returned_value;
}

function display_tasks($conn) {
    $query = "SELECT * FROM `Site`;";
    $result = mysqli_query($conn, $query);
    $html = "";
    $final_result = array();
    if ($result) {
        $row_count = mysqli_num_rows($result);

        for ($i = 0; $i < $row_count; ++$i) {
```

```
        $row = mysqli_fetch_array($result);


        $task = array("id" => $row["ID"], "av" => $row["availability"], "lng" => $row["lng"], "lat" =>
$row["lat"], "desc" => $row["description"]);

        $final_result["tasks"][] = $task;
      }
   }

   return json_encode($final_result);
}

?>
```

The most important file, which is the javaScript file, or if we can say the heart of the interface on the website

```
var map;
var current_address = "saudi arabia";
var flag = 0;
var infoWindows = [];
var markers = [];

$(document).ready(function () {

   start();

});
function start() {
   var ua = navigator.userAgent.toLowerCase();
   var android = ua.indexOf("android") > -1;
   if (android) {
```

```
        $("#mobileDiv").addClass("visible");
        $("#mobileDiv").removeClass("invisible");


    }


    show_map(current_address, 5);
    get_sites();
    setTimeout(init, 3000);

    setInterval(repeat, 20000);
}

function refresh() {
    $("#refreshB").addClass("RAnim");




    setTimeout(function () {
        $("#refreshB").removeClass("RAnim");
        init();
    }, 2000);

}

function removeMobileDiv() {
    $("#mobileDiv").removeClass("visible");
    $("#mobileDiv").addClass("invisible");
}
```

```
var menuPointer = 0;
function menuFunction() {
    if (menuPointer == 0) {

        $("#lefty").removeClass("menuAnimation2");
        $("#menuB").removeClass("BAnimation2");
        $("#lefty").addClass("menuAnimation");
        $("#menuB").addClass("BAnimation");



        setTimeout(function () {
            $("#menuB").css("top", "1200%");
            $("#lefty").css("height", "100%");
            $("#leftyContent").addClass("visible");
            $("#leftyContent").removeClass("invisible");

        }, 950);

        menuPointer = 1;



    } else {
        $("#leftyContent").removeClass("visible");
        $("#leftyContent").addClass("invisible");
        $("#lefty").removeClass("menuAnimation");
        $("#menuB").removeClass("BAnimation");
        $("#lefty").addClass("menuAnimation2");
        $("#menuB").addClass("BAnimation2");



        setTimeout(function () {

            $("#menuB").css("top", "0");
            $("#lefty").css("height", "0");
        }, 950);
```

```
        menuPointer = 0

    }

}

function init() {

    if (current_address == "saudi arabia") {
        show_map(current_address, 5);

    } else {
        show_map(current_address, 18);

    }

    get_sites();


}


function repeat() {
    $("#loading").addClass("visible");
    $("#loading").removeClass("invisible");


    deleteMarkers();

    get_new_sites();


    setTimeout(function () {
        $("#loading").addClass("invisible");
        $("#loading").removeClass("visible");
```

```
    }, 1000);

}




function setMapOnAll(map) {
    for (var i = 0; i < markers.length; i++) {
        markers[i].setMap(map);
    }
}
function clearMarkers() {

    setMapOnAll(null);
}
function deleteMarkers() {
    clearMarkers();
    markers = [];
}

function get_sites() {
    $.ajax({
        method: "POST",
        url: "server/newEmptyPHP1.php",
        dataType: "json",
        data: {type: "tasks"},
        success: function (data) {



            $.each(data, function () {
                var total = 0;
                $.each(this, function () {
                    total += this.av;
                    if (parseFloat(this.av) == 1) {
```

```
var myLatLng = {lat: parseFloat(this.lng), lng: parseFloat(this.lat)};


var desc= this.desc;


var geoUri = "http://maps.google.com/maps?q=loc:" + parseFloat(this.lng) + "," +
parseFloat(this.lat);
var contentString = '<br>';

 if(desc=="students parking")
    contentString+='<img class="conntentCenter" src="image/W4966.jpg"
width=100% <br>';
 else
    contentString+='<img class="conntentCenter" src="image/W4937.jpg"
width=100% <br>';

contentString+='<h2 class="conntentCenter" ><a   href="' + geoUri + '"> Take Me
There !</a> </h2>';
contentString+='<div>';


var infowindow = new google.maps.InfoWindow({
   content: contentString,
   maxWidth: 150

});
var marker = new google.maps.Marker({
   position: myLatLng,
   map: map


});
marker.setMap(map);
window.markers.push(marker);
```

```
    marker.addListener('click', function () {
        window.infoWindows.push(infowindow);

        for (var i = 0; i < infoWindows.length; i++) {
            infoWindows[i].close();

        }
        infowindow.open(map, marker);
        map.setCenter(marker.getPosition());



    });
    marker.setAnimation(google.maps.Animation.BOUNCE);

    if (flag == 0) {
        current_address = (this.lng + "," + this.lat);
        flag = 1;
    }

    marker.setMap(map);


}
setTimeout(function () {

    $("#loading").addClass("invisible");
    $("#loading").removeClass("visible");

}, 2000);
if (total == 0) {
    $("#myp").removeClass("invisible");
    $("#myp").addClass("visible");

} else
{
```

```
                $("#myp").addClass("invisible");
                $("#myp").removeClass("visible");

            }



        });
    });

}
});
}


function get_new_sites() {
    $.ajax({
        method: "POST",
        url: "server/newEmptyPHP1.php",
        dataType: "json",
        data: {type: "tasks"},
        success: function (data) {
            $("#loading").addClass("visible");
            $("#loading").removeClass("invisible");

            jQuery.each(data, function () {
                var total = 0;
                jQuery.each(this, function () {
                    total += this.av;
                    if (parseFloat(this.av) == 1) {



                        var myLatLng = {lat: parseFloat(this.lng), lng: parseFloat(this.lat)};
                        var desc= this.desc;
```

```
                var geoUri = "http://maps.google.com/maps?q=loc:" + parseFloat(this.lng) + "," +
parseFloat(this.lat);
                var contentString = '<br>';

                 if(desc=="students parking")
                    contentString+='<img class="conntentCenter" src="image/W4966.jpg"
width=100% <br>';
                 else
                    contentString+='<img class="conntentCenter" src="image/W4937.jpg"
width=100% <br>';

                contentString+='<h2 class="conntentCenter" ><a   href="' + geoUri + '"> Take Me
There !</a> </h2>';
                contentString+='<div>';


                var infowindow = new google.maps.InfoWindow({
                   content: contentString,
                   maxWidth: 150

                });
                var marker = new google.maps.Marker({
                   position: myLatLng,
                   map: map

                });

                window.markers.push(marker);
                marker.addListener('click', function () {
                   window.infoWindows.push(infowindow);

                   for (var i = 0; i < infoWindows.length; i++) {
                      infoWindows[i].close();

                   }
```

```
                    infowindow.open(map, marker);
                    map.setCenter(marker.getPosition());

                });
                marker.setAnimation(google.maps.Animation.BOUNCE);
                marker.setMap(map);

            }
            if (total == 0) {
                $("#myp").removeClass("invisible");
                $("#myp").addClass("visible");

            } else
            {
                $("#myp").addClass("invisible");
                $("#myp").removeClass("visible");

            }



        });
    });

  }
});

}


function show_map(address, zoom) {

    var geocoder = new google.maps.Geocoder(); //create the geocoder object
    if (geocoder) {
        geocoder.geocode({'address': address}, function (results, status) {
            if (status == google.maps.GeocoderStatus.OK) {
```

```
            var location = results[0].geometry.location; //get the longtitude and latitude of a point
            var mapProp = {//define the map options
                center: new google.maps.LatLng(location.lat(), location.lng()),
                zoom: zoom,
                mapTypeId: google.maps.MapTypeId.ROADMAP,
                mapTypeControl: false

            };

            map = new google.maps.Map(document.getElementById('map'), mapProp);



        }
    });
  }
}
```

The images and media contents were not been mentioned, but that is visible on our website on the following link:

http://www.jazanu-sps.com/

2. Android app:

In that version, we going to speak only in the layout and the main java file

The mapsActivity file

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:animateLayoutChanges="true"

    >

    <ImageView
        android:layout_width="match_parent"
        android:layout_height="28pt"
        android:id="@+id/imageView5"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:src="#0c2c26" />




    <ImageView

        android:id="@+id/imageView6"
        android:layout_width="25pt"
        android:layout_height="25pt"

        android:paddingBottom="8pt"

        android:paddingLeft="4pt"
        android:paddingRight="4pt"
        android:paddingTop="8pt"
```

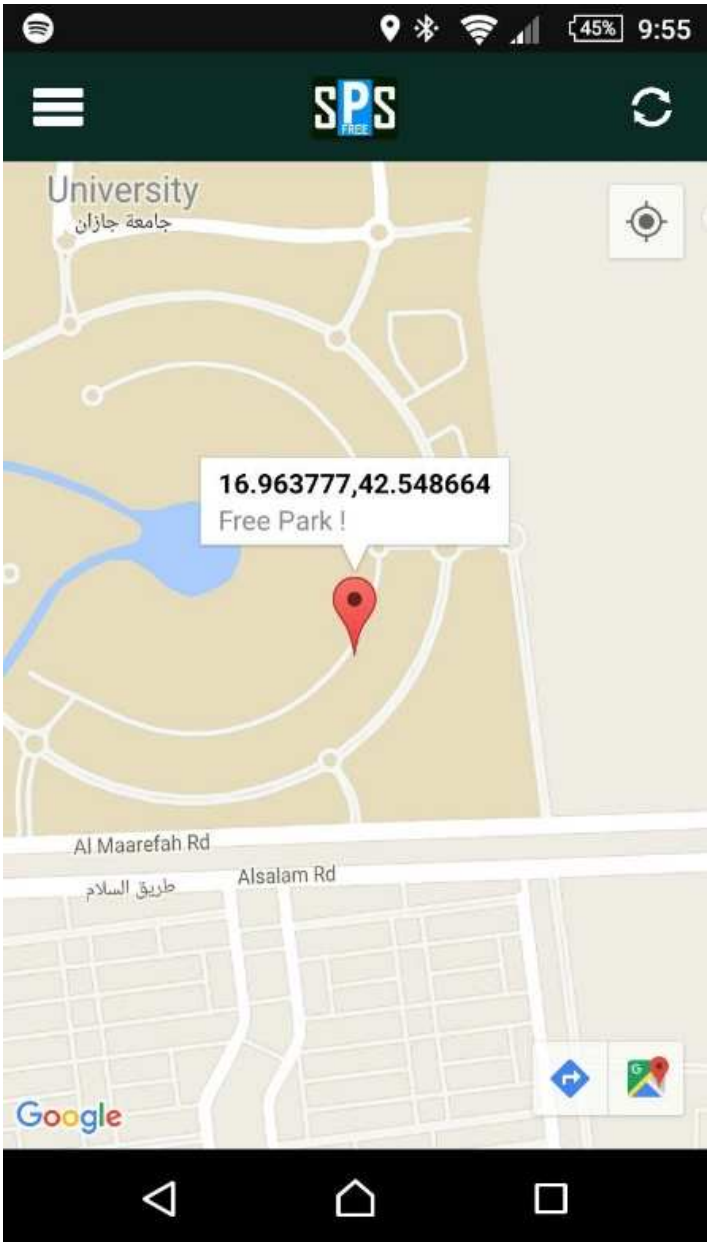
```
    android:src="@drawable/refresh"
    android:layout_alignParentTop="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentEnd="true"
    android:layout_alignBottom="@+id/imageView5" />

<ImageView

    android:id="@+id/imageView2"
    android:layout_width="25pt"
    android:layout_height="25pt"

    android:paddingBottom="8pt"

    android:paddingLeft="4pt"
    android:paddingRight="4pt"
    android:paddingTop="8pt"
    android:src="@drawable/menu"
    android:layout_alignParentTop="true"
    android:layout_alignParentLeft="true"
    android:layout_alignParentStart="true"
    android:layout_alignBottom="@+id/imageView5" />

<ImageView
    android:id="@+id/imageView"
    android:layout_height="match_parent"
    android:layout_width="39pt"


    android:padding="0dp"
    android:src="@mipmap/ic_launcher"
    android:layout_above="@+id/map"
    android:layout_centerHorizontal="true" />
```

```
<fragment xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:map="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/map"
    android:name="com.google.android.gms.maps.SupportMapFragment"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_alignParentLeft="true"
    android:layout_alignParentStart="true"
    tools:context="www.jazanu_sps.com.myapplication.MapsActivity"
    tools:layout="@layout/temp"
    android:layout_below="@+id/imageView5" />

<TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"

    android:background="@color/myPColor"
    android:paddingBottom="3pt"
    android:paddingLeft="20pt"

    android:paddingRight="20pt"
    android:paddingTop="2pt"
    android:text="@string/sorryMessage"
    android:textAppearance="?android:attr/textAppearanceLarge"
    android:textColor="@color/myPColorTxt"
    android:layout_marginTop="5pt"
    android:layout_below="@+id/imageView5"
    android:layout_centerHorizontal="true" />

<ProgressBar
    android:id="@+id/progressBar"
    style="?android:attr/progressBarStyleLarge"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
```

```
    android:layout_centerHorizontal="true"
    android:layout_centerVertical="true" />

<TextView
    android:id="@+id/textView3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:background="@color/myPColor"
    android:paddingBottom="4pt"
    android:paddingLeft="15pt"
    android:paddingRight="15pt"

    android:paddingTop="4pt"
    android:text="@string/connectionErrorMessage"
    android:textAppearance="?android:attr/textAppearanceMedium"
    android:textColor="@color/myPColorTxt"
    android:layout_alignBottom="@+id/map"
    android:layout_centerHorizontal="true"
    android:layout_marginBottom="10pt" />

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textAppearance="?android:attr/textAppearanceSmall"
    android:text="@string/beta"
    android:id="@+id/textView4"
    android:layout_marginLeft="5pt"
    android:layout_marginRight="5pt"
    android:layout_marginTop="5pt"
    android:layout_alignTop="@+id/map"
    android:layout_alignParentLeft="true"
    android:layout_alignParentStart="true" />

<ImageView
    android:layout_width="30pt"
    android:layout_height="30pt"
```

```
    android:id="@+id/imageView7"
    android:src="@drawable/directions"
    android:layout_alignParentBottom="true"
    android:layout_alignParentRight="true"
    android:layout_marginRight="10pt"
    android:layout_marginLeft="10pt"
    android:layout_marginBottom="10pt"

    android:layout_alignParentEnd="true" />


</RelativeLayout>
```

Moreover, that should give us the following result




And finally, the engine of the program, the main java file

```
package www.jazanu_sps.com.myapplication;

import android.Manifest;
import android.annotation.TargetApi;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.net.Uri;
```

```
import android.os.Build;
import android.os.Bundle;
import android.os.Handler;
import android.os.StrictMode;
import android.os.SystemClock;
import android.support.annotation.NonNull;
import android.support.v4.app.ActivityCompat;
import android.support.v4.app.FragmentActivity;
import android.support.v4.content.ContextCompat;
import android.view.View;
import android.widget.ImageView;
import android.widget.ProgressBar;
import android.widget.TextView;
import android.widget.Toast;

import com.google.android.gms.ads.AdSize;
import com.google.android.gms.ads.AdView;
import com.google.android.gms.appindexing.Action;
import com.google.android.gms.appindexing.AppIndex;
import com.google.android.gms.common.api.GoogleApiClient;
import com.google.android.gms.maps.CameraUpdateFactory;
import com.google.android.gms.maps.GoogleMap;
import com.google.android.gms.maps.OnMapReadyCallback;
import com.google.android.gms.maps.SupportMapFragment;
import com.google.android.gms.maps.model.BitmapDescriptorFactory;
import com.google.android.gms.maps.model.LatLng;
import com.google.android.gms.maps.model.Marker;
import com.google.android.gms.maps.model.MarkerOptions;
import com.mysql.jdbc.Statement;

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;

public class MapsActivity extends FragmentActivity implements
OnMapReadyCallback,GoogleMap.OnMarkerClickListener {
```

```
    // Identifier for the permission request
    private static final int ACCESS_PERMISSIONS_REQUEST = 1;
    private static final String TAG = "a";

    // Called when the user is performing an action which requires the app to read the
    // user's contacts
    @TargetApi(Build.VERSION_CODES.M)
    public void getPermissionToAccessLocation() {
        // 1) Use the support library version ContextCompat.checkSelfPermission(...) to avoid
        // checking the build version since Context.checkSelfPermission(...) is only available
        // in Marshmallow
        // 2) Always check for permission (even if permission has already been granted)
        // since the user can revoke permissions at any time through Settings
        if (ContextCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION)
                != PackageManager.PERMISSION_GRANTED) {



            // The permission is NOT already granted.
            // Check if the user has been asked about this permission already and denied
            // it. If so, we want to give more explanation about why the permission is needed.
            if (shouldShowRequestPermissionRationale(
                    Manifest.permission.ACCESS_FINE_LOCATION)) {



                // Show our own UI to explain to the user why we need to read the contacts
                // before actually requesting the permission and showing the default UI
            }

            // Fire off an async request to actually get the permission
            // This will show the standard permission request dialog UI
```

```
        requestPermissions(new String[]{Manifest.permission.ACCESS_FINE_LOCATION},
                ACCESS_PERMISSIONS_REQUEST);

        SystemClock.sleep(7000);
    }
}

// Callback with the request from calling requestPermissions(...)
@Override
public void onRequestPermissionsResult(int requestCode,
                                       @NonNull String permissions[],
                                       @NonNull int[] grantResults) {
    // Make sure it's our original READ_CONTACTS request
    if (requestCode == ACCESS_PERMISSIONS_REQUEST) {
        if (grantResults.length == 1 &&
                grantResults[0] == PackageManager.PERMISSION_GRANTED) {
            Toast.makeText(this, "welcome", Toast.LENGTH_SHORT).show();
        } else {
            System.exit(0);
    }
    } else {
        super.onRequestPermissionsResult(requestCode, permissions, grantResults);
    }
}

private GoogleMap mMap;
private static final LatLng SaudiArabia = new LatLng(23.885808, 45.074744);
LatLng temp = new LatLng(0, 0);
private static final String url = "jdbc:mysql://54.247.107.148:3306/sql2105932";
private static final String user = "sql2105932";
private static final String pass = "nY9%tF2!";
int total = 0;


/**
```

```
    * ATTENTION: This was auto-generated to implement the App Indexing API.
    * See https://g.co/AppIndexing/AndroidStudio for more information.
    */
    private GoogleApiClient client;



    @Override
    protected void onCreate(Bundle savedInstanceState) {


        if (android.os.Build.VERSION.SDK_INT >= Build.VERSION_CODES.M) {
            // only for gingerbread and newer versions
            getPermissionToAccessLocation();



        }

        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_maps);


        // Obtain the SupportMapFragment and get notified when the map is ready to be used.
        SupportMapFragment mapFragment = (SupportMapFragment)
getSupportFragmentManager()
                .findFragmentById(R.id.map);
        mapFragment.getMapAsync(this);

        AdView adView = new AdView(this);
        adView.setAdSize(AdSize.SMART_BANNER);


        client = new GoogleApiClient.Builder(this).addApi(AppIndex.API).build();
```

```
TextView tv2 = (TextView) findViewById(R.id.textView2);
tv2.setVisibility(View.GONE);
TextView tv3 = (TextView) findViewById(R.id.textView3);
tv3.setVisibility(View.GONE);

ProgressBar pb = (ProgressBar) findViewById(R.id.progressBar);
pb.setVisibility(View.VISIBLE);


ImageView iv2 = (ImageView) findViewById(R.id.imageView2);
iv2.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent i = new Intent(MapsActivity.this, MainActivity2.class);
        startActivity(i);

    }
});
ImageView iv7=(ImageView)findViewById(R.id.imageView7);
iv7.setVisibility(View.GONE);

ImageView iv = (ImageView) findViewById(R.id.imageView6);
iv.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {

        ImageView iv7=(ImageView)findViewById(R.id.imageView7);
        iv7.setVisibility(View.GONE);

        TextView tv3 = (TextView) findViewById(R.id.textView3);
        tv3.setVisibility(View.GONE);

        TextView tv2 = (TextView) findViewById(R.id.textView2);
        tv2.setVisibility(View.GONE);
```

```
ProgressBar pb = (ProgressBar) findViewById(R.id.progressBar);
pb.setVisibility(View.VISIBLE);

mMap.clear();

final Handler handler = new Handler();
handler.postDelayed(new Runnable() {
    @Override
    public void run() {
        try {
            StrictMode.ThreadPolicy policy =
                    new StrictMode.ThreadPolicy.Builder().permitAll().build();
            StrictMode.setThreadPolicy(policy);
            Class.forName("com.mysql.jdbc.Driver");
            Connection con = DriverManager.getConnection(url, user, pass);
            Statement st = (Statement) con.createStatement();
            ResultSet rs = (ResultSet) st.executeQuery("SELECT * FROM `Site`;");
            total = 0;

            while (rs.next()) {


                if (rs.getInt(2) == 1) {

                    total += 1;//for future use

                    temp = new LatLng(rs.getDouble(3), rs.getDouble(4));



                    Marker m = mMap.addMarker(new MarkerOptions()
                            .position(temp)
                            .title(rs.getString(5))

                            .snippet("click down below ")
```

```
.icon(BitmapDescriptorFactory.defaultMarker(BitmapDescriptorFactory.HUE_RED)));


                    }
                }
                if (total > 0) {
                    mMap.moveCamera(CameraUpdateFactory.newLatLng(temp));

                    TextView tv2 = (TextView) findViewById(R.id.textView2);
                    tv2.setVisibility(View.GONE);
                } else {
                    TextView tv2 = (TextView) findViewById(R.id.textView2);
                    tv2.setVisibility(View.VISIBLE);
                }


            } catch (Exception e) {

                e.printStackTrace();

                TextView tv3 = (TextView) findViewById(R.id.textView3);
                tv3.setVisibility(View.VISIBLE);
                return;

            }

        }
    }, 1000);


    final Handler handler2 = new Handler();
    handler2.postDelayed(new Runnable() {
        @Override
        public void run() {
            ProgressBar pb = (ProgressBar) findViewById(R.id.progressBar);
```

```
                pb.setVisibility(View.GONE);

            }
        }, 3000);


    }
});


}


/**
 * Manipulates the map once available.
 * This callback is triggered when the map is ready to be used.
 * This is where we can add markers or lines, add listeners or move the camera. In this case,
 * we just add a marker near Sydney, Australia.
 * If Google Play services is not installed on the device, the user will be prompted to install
 * it inside the SupportMapFragment. This method will only be triggered once the user has
 * installed Google Play services and returned to the app.
 */
@Override
public void onMapReady(GoogleMap googleMap) {


   TextView tv3 = (TextView) findViewById(R.id.textView3);
    tv3.setVisibility(View.GONE);
    TextView tv2 = (TextView) findViewById(R.id.textView2);
    tv2.setVisibility(View.GONE);
    googleMap.setMyLocationEnabled(true);
    googleMap.setOnMarkerClickListener(this);


    mMap = googleMap;
```

```
        if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION) != PackageManager.PERMISSION_GRANTED
&& ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
            return;
        }
        mMap.setMyLocationEnabled(true);
        mMap.moveCamera(CameraUpdateFactory.newLatLngZoom(SaudiArabia, 4));

        mMap.setOnMapClickListener(new GoogleMap.OnMapClickListener() {
            @Override
            public void onMapClick(LatLng arg0) {
                ImageView iv7=(ImageView) findViewById(R.id.imageView7);
                iv7.setVisibility(View.GONE);
            }
        });


        final Handler handler2 = new Handler();
        handler2.postDelayed(new Runnable() {
            @Override
            public void run() {


                try {
                    StrictMode.ThreadPolicy policy =
                            new StrictMode.ThreadPolicy.Builder().permitAll().build();
                    StrictMode.setThreadPolicy(policy);
                    Class.forName("com.mysql.jdbc.Driver");
                    Connection con = DriverManager.getConnection(url, user, pass);

                    Statement st = (Statement) con.createStatement();
                    ResultSet rs = (ResultSet) st.executeQuery("SELECT * FROM `Site`;");

                    while (rs.next()) {
```

```
                if (rs.getInt(2) == 1) {

                    total += 1;//for future use

                    temp = new LatLng(rs.getDouble(3), rs.getDouble(4));
                    if (total == 1)
                        mMap.moveCamera(CameraUpdateFactory.newLatLngZoom(temp, 10));


                    Marker m = mMap.addMarker(new MarkerOptions()
                            .position(temp)
                            .title(rs.getString(5))
                            .snippet("click down below ")

.icon(BitmapDescriptorFactory.defaultMarker(BitmapDescriptorFactory.HUE_RED)));


                }
            }


        } catch (Exception e) {
            e.printStackTrace();
            TextView tv3 = (TextView) findViewById(R.id.textView3);
            tv3.setVisibility(View.VISIBLE);
            ProgressBar pb = (ProgressBar) findViewById(R.id.progressBar);
            pb.setVisibility(View.GONE);
            return;

        }

        if (total > 0) {
            TextView tv2 = (TextView) findViewById(R.id.textView2);
            tv2.setVisibility(View.GONE);
```

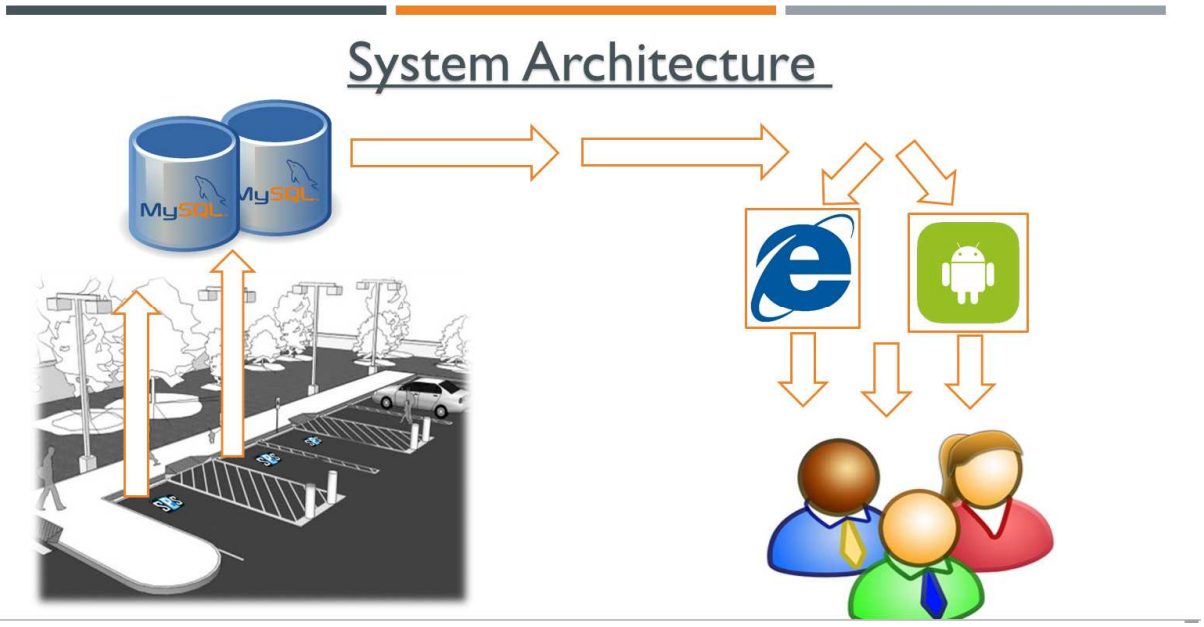
```
            final Handler handler = new Handler();
            handler.postDelayed(new Runnable() {
                @Override
                public void run() {

                    mMap.animateCamera(CameraUpdateFactory.zoomTo(17), 1000, null);
                    ProgressBar pb = (ProgressBar) findViewById(R.id.progressBar);
                    pb.setVisibility(View.GONE);
                }
            }, 2000);

        } else {

            TextView tv2 = (TextView) findViewById(R.id.textView2);
            tv2.setVisibility(View.VISIBLE);
            final Handler handler = new Handler();
            handler.postDelayed(new Runnable() {
                @Override
                public void run() {


                    ProgressBar pb = (ProgressBar) findViewById(R.id.progressBar);
                    pb.setVisibility(View.GONE);
                }
            }, 2000);
        }

    }
}, 2000);


}

@Override
public boolean onMarkerClick(final Marker marker) {
    marker.showInfoWindow();
```

```
        mMap.animateCamera(CameraUpdateFactory.newLatLng(marker.getPosition()));
        ImageView iv7=(ImageView) findViewById(R.id.imageView7);
        iv7.setVisibility(View.VISIBLE);
        iv7.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                LatLng markerLocation = marker.getPosition();

                /*Intent intent = new Intent(Intent.ACTION_VIEW, Uri.parse("geo:<" +
markerLocation.latitude  + ">,<" + markerLocation.longitude + ">?q=<" + markerLocation.latitude
+ ">,<" + markerLocation.longitude + ">(" + "Free Park" + ")"));

                startActivity(intent);*/
                Toast.makeText(getApplicationContext(),"Let's Go",Toast.LENGTH_SHORT).show();
                Uri gmmIntentUri =
Uri.parse("google.navigation:q="+markerLocation.latitude+","+markerLocation.longitude);
                Intent mapIntent = new Intent(Intent.ACTION_VIEW, gmmIntentUri);
                mapIntent.setPackage("com.google.android.apps.maps");
                startActivity(mapIntent);

            }
        });

        return true;
    }


    @Override
    public void onStart() {
        super.onStart();

        // ATTENTION: This was auto-generated to implement the App Indexing API.
        // See https://g.co/AppIndexing/AndroidStudio for more information.
        client.connect();
        Action viewAction = Action.newAction(
                Action.TYPE_VIEW, // TODO: choose an action type.
```

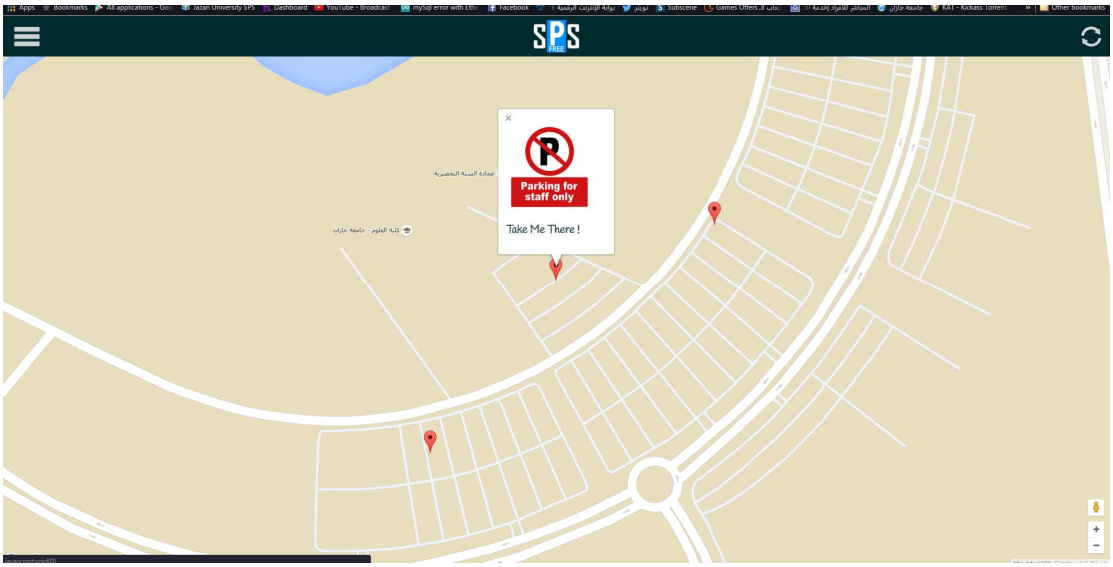
```
            "Maps Page", // TODO: Define a title for the content shown.
            // TODO: If you have web page content that matches this app activity's content,
            // make sure this auto-generated web page URL is correct.
            // Otherwise, set the URL to null.
            Uri.parse("http://host/path"),
            // TODO: Make sure this auto-generated app deep link URI is correct.
            Uri.parse("android-app://www.jazanu_sps.com.myapplication/http/host/path")
    );
    AppIndex.AppIndexApi.start(client, viewAction);
  }

  @Override
  public void onStop() {
    super.onStop();

    // ATTENTION: This was auto-generated to implement the App Indexing API.
    // See https://g.co/AppIndexing/AndroidStudio for more information.
    Action viewAction = Action.newAction(
            Action.TYPE_VIEW, // TODO: choose an action type.
            "Maps Page", // TODO: Define a title for the content shown.
            // TODO: If you have web page content that matches this app activity's content,
            // make sure this auto-generated web page URL is correct.
            // Otherwise, set the URL to null.
            Uri.parse("http://host/path"),
            // TODO: Make sure this auto-generated app deep link URI is correct.
            Uri.parse("android-app://www.jazanu_sps.com.myapplication/http/host/path")
    );
    AppIndex.AppIndexApi.end(client, viewAction);
    client.disconnect();
  }



}
```

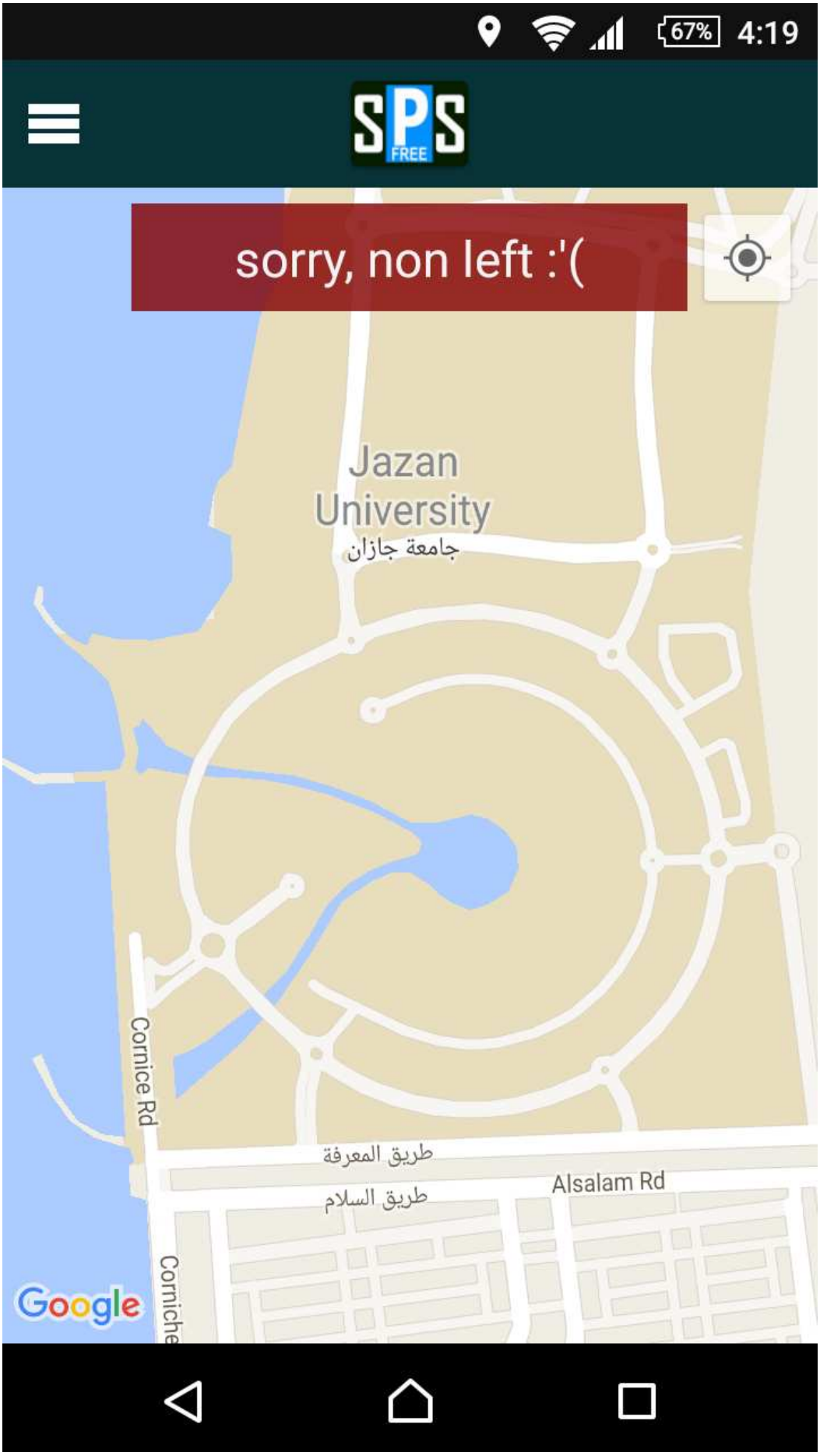
We are more than happy to announce that the project website and the android app are officially published on the internet and the original android market (google play) and they are available for free on both sides.

Use the following QR code to move to JASAN UNIVERSITY SPS on android;



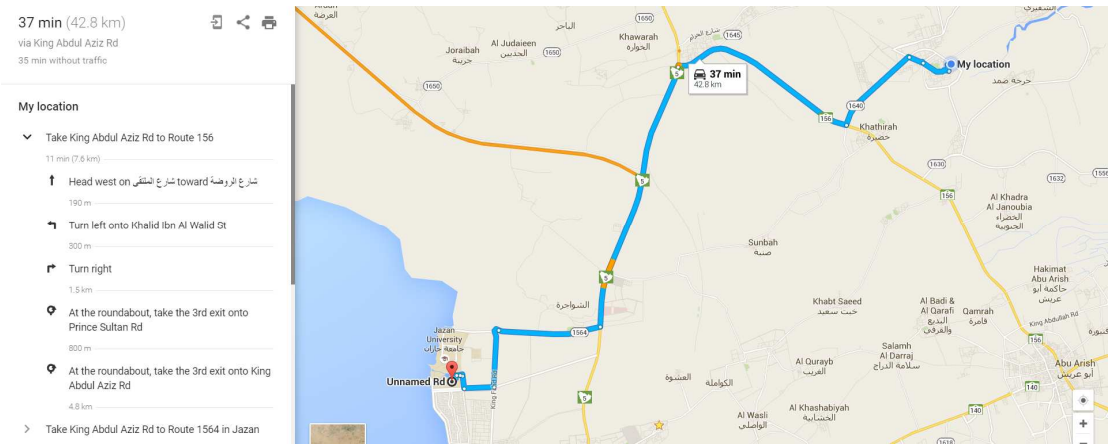
Demos from website and android app

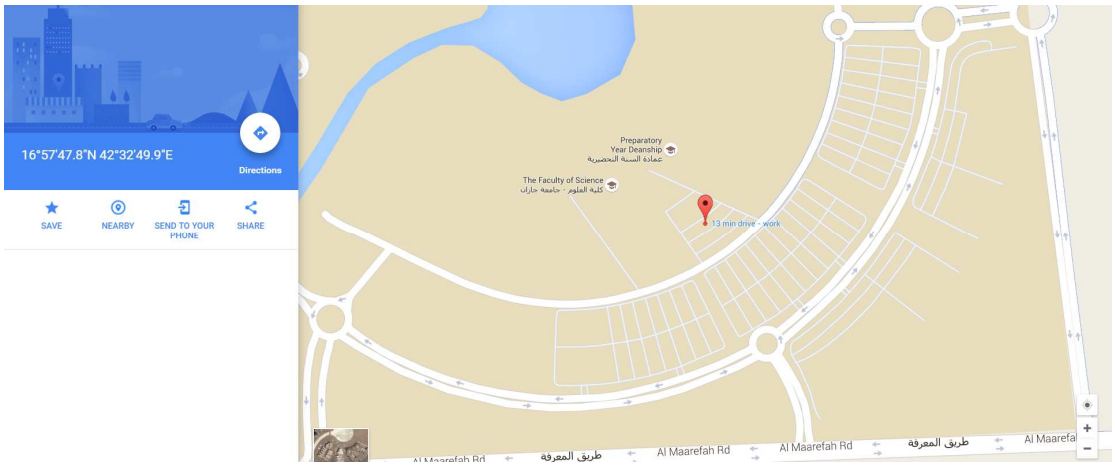




67% 4:19
SPS
FREE
sorry, non left :'(
Jazan
University
جامعة جازان
Cornice Rd
طريق المعرفة
طريق السلام
Alsalam Rd
Google


67% 4:19
JAZANU-SPS
SPS
FREE
SPS stands for "Smart Parking System",It's a graduation project for a bunch of computer science students at JAZAN UNIVERSITY, Contact us at the following E-mail:
201211162@stu.jazanu.edu.sa


68% 4:17
SPS FREE
University
جامعة جازان
16.963777,42.548664
Free Park !
Faculty of Science at
ne University of Jazan
كلية العلوم بجامعة جازان
طريق المعرفة
طريق السلام
Alsalam Rd
Google




# Database design:

### mySql database handling

| ID | availability | lng | lat | description |
|---|---|---|---|---|
| 1 | 0 | 16.963777 | 42.548664 | students parking |
| 2 | 1 | 16.963273 | 42.547192 | staff parking |

**Database sql2105932**

**Table structure for table Site**

| Column | Type | Null | Default |
|---|---|---|---|
| ***ID*** | int(11) | No | 0 |
| availability | int(11) | No | |
| lng | double | No | |
| lat | double | No | |
| description | text | No | |

**Dumping data for table Site**

1 1 16.963777 42.548664 students parking

2 1 16.961734 42.546019 students parking

3 1 16.963273 42.547192 staff parking

**Table structure for table Site**

| Column | Type | Null | Default |
|---|---|---|---|
| ***ID*** | int(11) | No | 0 |
| availability | int(11) | No | |
| lng | double | No | |
| lat | double | No | |
| description | text | No | |

In addition, as we sow previously, the table contains four main columns as the following

Id

Every parking detector unit must have unique id to be reference in the updating statements.

Availability

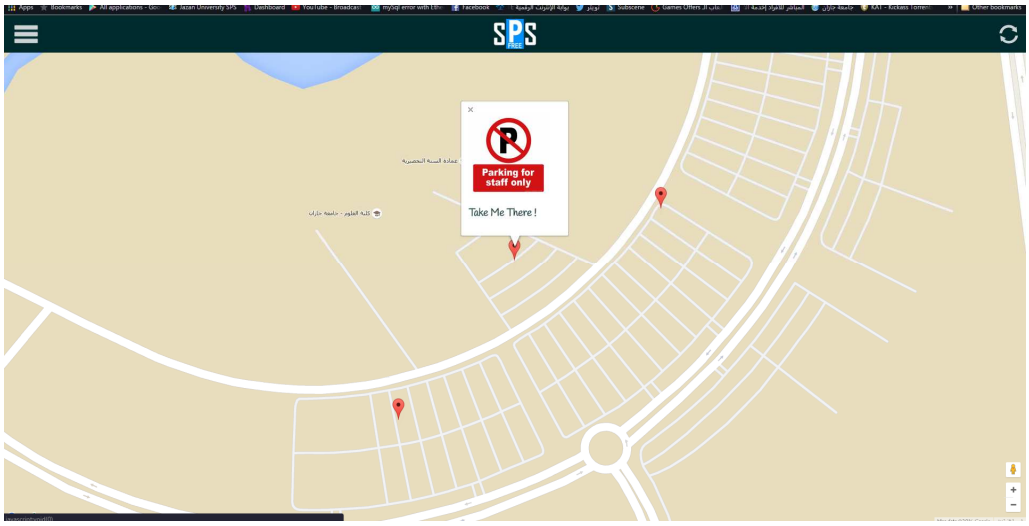
Represents wither the parking spot is empty on not

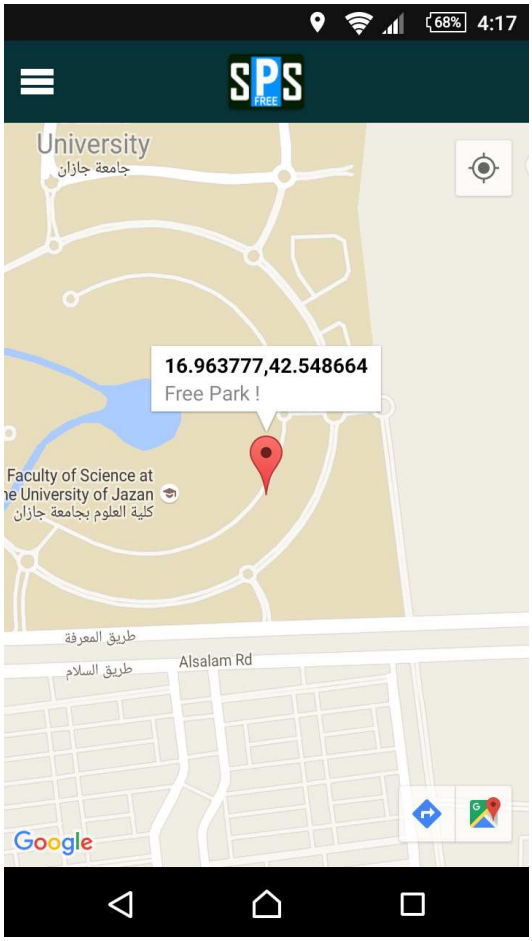
Lat,lat

Represent the longitude and the latitude on that parking to recognized by the different interfaces.

# User Interface Design

As the code is already showed to us, we going to have a look at the final interfaces on android and the website.






# 7. IMPLEMENTATION

## 7.1. NETBEANS 7.0.1:

NetBeans is a software development platform written in Java. The NetBeans Platform allows applications to be developed from a set of modular software components called modules. Applications based on the NetBeans Platform, including the NetBeans integrated development environment (IDE), can be extended by third party developers.

The NetBeans IDE is primarily intended for development in Java, but also supports other languages, in particular PHP, C/C++ and HTML5.

NetBeans is cross-platform and runs on Microsoft Windows, Mac OS X, Linux, Solaris and other platforms supporting a compatible JVM.

The NetBeans Team actively support the product and seek feature suggestions from the wider community. Every release is preceded by a time for Community testing and feedback.

**History:**

**NetBeans IDE Releases:**

NetBeans began in 1996 as Xelfi (word play on Delphi), a Java IDE student project under the guidance of the Faculty of Mathematics and Physics at Charles University in Prague. In 1997 Roman Staněk formed a company around the project and produced commercial versions of the NetBeans IDE until it was bought by Sun Microsystems in 1999. Sun open-sourced the NetBeans IDE in June of the following year. Since then, the NetBeans community has continued to grow.In 2010, Sun (and thus NetBeans) was acquired by Oracle.

**Current versions:**
NetBeans IDE 6.0 introduced support for developing IDE modules and rich client applications based on the NetBeans platform, a Java Swing GUI builder (formerly known as "Project Matisse"), improved CVS support, WebLogic 9 and JBoss 4 support, and many editor enhancements. NetBeans 6 is available in official repositories of major Linux distributions.

NetBeans IDE 6.5, released in November 2008, extended the existing Java EE features (including Java Persistence support, EJB 3 and JAX-WS). Additionally, the NetBeans Enterprise Pack supports development of Java EE 5 enterprise applications, including SOA visual design tools, XML schema tools, web services orchestration (for BPEL), and UML modeling. The NetBeans IDE Bundle for C/C++ supports C/C++ and FORTRAN development.

NetBeans IDE 6.8 is the first IDE to provide complete support of Java EE 6 and the GlassFish Enterprise Server v3. Developers hosting their open-source projects on kenai.com additionally benefit from instant messaging and issue tracking integration and navigation right in the IDE, support for web application development with PHP 5.3 and the Symfony framework, and improved code completion, layouting, hints and navigation in JavaFX projects.

NetBeans IDE 6.9, released in June 2010, added support for OSGi, Spring Framework 3.0, Java EE dependency injection (JSR-299), Zend Framework for PHP, and easier code navigation (such as "Is Overridden/Implemented" annotations), formatting, hints, and refactoring across several languages.

NetBeans IDE 7.0 was released in April 2011. On August 1, 2011, the NetBeans Team released NetBeans IDE 7.0.1, which has full support for the official release of the Java SE 7 platform. NetBeans IDE 7.3 was released in February 2013 which added support for HTML5 and web technologies.
NetBeans IDE 7.4 was released on October 15, 2013.

NetBeans IDE 8.0 was released on March 18, 2014.

**NetBeans Platform:**

Framework for simplifying the development of Java Swing desktop applications. The NetBeans IDE bundle for Java SE contains what is needed to start developing NetBeans plugins and NetBeans Platform based applications; no additional SDK is required.

Applications can install modules dynamically. Any application can include the Update Center module to allow users of the application to download digitally signed upgrades and new features directly into the running application. Reinstalling an upgrade or a new release does not force users to download the entire application again.

The platform offers reusable services common to desktop applications, allowing developers to focus on the logic specific to their application. Among the features of the platform are:

User interface management (e.g. menus and toolbars)
User settings management
Storage management (saving and loading any kind of data)
Window management
Wizard framework (supports step-by-step dialogs)
NetBeans Visual Library
Integrated development tools
NetBeans IDE is a free, open-source, cross-platform IDE with built-in-support for Java Programming Language.

**NetBeans IDE:**

NetBeans IDE is an open-source integrated development environment. NetBeans IDE supports development of all Java application types (Java SE (including JavaFX), Java ME, web, EJB and mobile applications) out of the box. Among other features are an Ant-based project system, Maven support, refactorings, version control (supporting CVS, Subversion, Git, Mercurial and Clearcase).

Modularity: All the functions of the IDE are provided by modules. Each module provides a well defined function, such as support for the Java language, editing, or support for the CVS versioning system, and SVN. NetBeans contains all the modules needed for Java development in a single download, allowing the user to start working immediately. Modules also allow NetBeans to be extended. New features, such as support for other programming languages, can be added by

installing additional modules. For instance, Sun Studio, Sun Java Studio Enterprise, and Sun Java Studio Creator from Sun Microsystems are all based on the NetBeans IDE.

License: From July 2006 through 2007, NetBeans IDE was licensed under Sun's Common Development and Distribution License (CDDL), a license based on the Mozilla Public License (MPL). In October 2007, Sun announced that NetBeans would henceforth be offered under a dual license of the CDDL and the GPL version 2 licenses, with the GPL linking exception for GNU Classpath.

**NetBeans Profiler:**
The NetBeans Profiler is a tool for the monitoring of Java applications: It helps developers find memory leaks and optimize speed. Formerly downloaded separately, it is integrated into the core IDE since version 6.0.

The Profiler is based on a Sun Laboratories research project that was named JFluid. That research uncovered specific techniques that can be used to lower the overhead of profiling a Java application. One of those techniques is dynamic bytecode instrumentation, which is particularly useful for profiling large Java applications. Using dynamic bytecode instrumentation and additional algorithms, the NetBeans Profiler is able to obtain runtime information on applications that are too large or complex for other profilers. NetBeans also support Profiling Points that let you profile precise points of execution and measure execution time.

**GUI design tool:**
Formerly known as project Matisse, the GUI design-tool enables developers to prototype and design Swing GUIs by dragging and positioning GUI components.

The GUI builder has built-in support for JSR 295 (Beans Binding technology), but the support for JSR 296 (Swing Application Framework) was removed in 7.1.

**NetBeans JavaScript editor:**
The NetBeans JavaScript editor provides extended support for JavaScript, Ajax, and CSS.

JavaScript editor features comprise syntax highlighting, refactoring, code completion for native objects and functions, generation of JavaScript class skeletons, generation of Ajax callbacks from a template; and automatic browser compatibility checks.

CSS editor features comprise code completion for styles names, quick navigation through the navigator panel, displaying the CSS rule declaration in a List View and file structure in a Tree View, sorting the outline view by name, type or declaration order (List & Tree), creating rule declarations (Tree only), refactoring a part of a rule name (Tree only).

The NetBeans 7.4 and later uses the new [Nashorn] JavaScript engine developed by Oracle.

**NetBeans IDE Download Bundles:**

Users can choose to download NetBeans IDE bundles tailored to specific development needs. Users can also download and install all other features at a later date directly through the NetBeans IDE.

**NetBeans IDE Bundle for Web and Java EE:**

The NetBeans IDE Bundle for Web & Java EE[18] provides complete tools for all the latest Java EE 6 standards, including the new Java EE 6 Web Profile, Enterprise Java Beans (EJBs), servlets, Java Persistence API, web services, and annotations. NetBeans also supports the JSF 2.0 (Facelets), JavaServer Pages (JSP), Hibernate, Spring, and Struts frameworks, and the Java EE 5 and J2EE 1.4 platforms. It includes GlassFish and Apache Tomcat. Some of its features with javaEE includes

Improved support for CDI, REST services and Java Persistence
New support for Bean Validation
Support for JSF component libraries, including bundled PrimeFaces library
Improved editing for Expression Language in JSF, including code completion, refactoring and hints
NetBeans IDE Bundle for Java ME
The NetBeans IDE Bundle for Java ME is a tool for developing applications that run on mobile devices; generally mobile phones, but this also includes entry-level PDAs, and Java Card, among others.

The NetBeans IDE comes bundled with the latest Java ME SDK 3.0 which supports both CLDC and CDC development. One can easily integrate third-party emulators for a robust testing environment. You can download other Java platforms, including the Java Card Platform 3.0, and register them in the IDE.

NetBeans IDE Bundle for PHP

NetBeans supports PHP since version 6.5. The bundle for PHP includes:

syntax highlighting, code completion, occurrence highlighting, error highlighting, CVS version control
semantic analysis with highlighting of parameters and unused local variables
PHP code debugging with xdebug
PHP Unit testing with PHPUnit and Selenium
Code coverage
Symfony framework support (since version 6.8)
Zend Framework support (since version 6.9)
Yii Framework support (since version 7.3)
PHP 5.3 namespace and closure support (since version 6.8)
Code Folding for Control Structures (since version 7.2 )
NetBeans IDE Complete Bundle
Oracle also releases a version of NetBeans that includes all of the features of the above bundles. This bundle includes:

**NetBeans Base IDE:**
Java SE, JavaFX
Web and Java EE
Java ME
C/C++
PHP (Version 6.5 and later)
Groovy
GlassFish
Apache Tomcat

**Java network programming**:
In client-server applications, the server provides some service, such as processing database queries or sending out current stock prices. The client uses the service provided by the server, either displaying database query results to the user or making stock purchase recommendations to an investor. The communication that occurs between the client and the server must be reliable. That is, no data can be dropped and it must arrive on the client side in the same order in which the server sent it.

TCP provides a reliable, point-to-point communication channel that client-server applications on the Internet use to communicate with each other. To communicate over TCP, a client program and a server program establish a connection to one another. Each program binds a socket to its end of the connection. To communicate, the client and the server each reads from and writes to the socket bound to the connection.

**What Is a Socket:**

Normally, a server runs on a specific computer and has a socket that is bound to a specific port number. The server just waits, listening to the socket for a client to make a connection request. On the client-side: The client knows the hostname of the machine on which the server is running and the port number on which the server is listening. To make a connection request, the client tries to rendezvous with the server on the server's machine and port. The client also needs to identify itself to the server so it binds to a local port number that it will use during this connection. This is usually assigned by the system.


If everything goes well, the server accepts the connection. Upon acceptance, the server gets a new socket bound to the same local port and also has its remote endpoint set to the address and port of the client. It needs a new socket so that it can continue to listen to the original socket for connection requests while tending to the needs of the connected client.


On the client side, if the connection is accepted, a socket is successfully created and the client can use the socket to communicate with the server.

The client and server can now communicate by writing to or reading from their sockets.

**Socket Definition:**

A socket is one endpoint of a two-way communication link between two programs running on the network. A socket is bound to a port number so that the TCP layer can identify the application that data is destined to be sent to.

An endpoint is a combination of an IP address and a port number. Every TCP connection can be uniquely identified by its two endpoints. That way you can have multiple connections between your host and the server.

The java.net package in the Java platform provides a class, Socket, that implements one side of a two-way connection between your Java program and another program on the network. The Socket class sits on top of a platform-dependent implementation, hiding the details of any particular system from your Java program. By using the java.net.Socket class instead of relying on native code, your Java programs can communicate over the network in a platform-independent fashion.

Additionally, java.net includes the ServerSocket class, which implements a socket that servers can use to listen for and accept connections to clients. This lesson shows you how to use the Socket and ServerSocket classes.

If you are trying to connect to the Web, the URL class and related classes (URLConnection, URLEncoder) are probably more appropriate than the socket classes. In fact, URLs are a relatively high-level connection to the Web and use sockets as part of the underlying implementation. See Working with URLs for information about connecting to the Web via URLs.

**Reading from and Writing to a Socket:**

Let's look at a simple example that illustrates how a program can establish a connection to a server program using the Socket class and then, how the client can send data to and receive data from the server through the socket.

The example program implements a client, EchoClient, that connects to an echo server. The echo server receives data from its client and echoes it back. The example EchoServer implements an echo server. (Alternatively, the client can connect to any host that supports the Echo Protocol.)

The EchoClient example creates a socket, thereby getting a connection to the echo server. It reads input from the user on the standard input stream, and then forwards that text to the echo

server by writing the text to the socket. The server echoes the input back through the socket to the client. The client program reads and displays the data passed back to it from the server.

Note that the EchoClient example both writes to and reads from its socket, thereby sending data to and receiving data from the echo server.

Let's walk through the program and investigate the interesting parts. The following statements in the try-with-resources statement in the EchoClient example are critical. These lines establish the socket connection between the client and the server and open a PrintWriter and a BufferedReader on the socket.
This client program is straightforward and simple because the echo server implements a simple protocol. The client sends text to the server, and the server echoes it back. When your client programs are talking to a more complicated server such as an HTTP server, your client program will also be more complicated. However, the basics are much the same as they are in this program:

- Open a socket.
- Open an input stream and output stream to the socket.
- Read from and write to the stream according to the server's protocol.
- Close the streams.
- Close the socket.

**What Is a Datagram:**

Clients and servers that communicate via a reliable channel, such as a TCP socket, have a dedicated point-to-point channel between themselves, or at least the illusion of one. To communicate, they establish a connection, transmit the data, and then close the connection. All data sent over the channel is received in the same order in which it was sent. This is guaranteed by the channel.

In contrast, applications that communicate via datagrams send and receive completely independent packets of information. These clients and servers do not have and do not need a dedicated point-to-point channel. The delivery of datagrams to their destinations is not guaranteed. Nor is the order of their arrival.

**DataGram Definition:**

A datagram is an independent, self-contained message sent over the network whose arrival, arrival time, and content are not guaranteed.

The java.net package contains three classes to help you write Java programs that use datagrams to send and receive packets over the network: DatagramSocket, DatagramPacket, and MulticastSocketAn application can send and receive DatagramPackets through a DatagramSocket. In addition, DatagramPackets can be broadcast to multiple recipients all listening to a MulticastSocket.
Writing a Datagram Client and Server

The example featured in this section consists of two applications: a client and a server. The server continuously receives datagram packets over a datagram socket. Each datagram packet received by the server indicates a client request for a quotation. When the server receives a datagram, it replies by sending a datagram packet that contains a one-line "quote of the moment" back to the client.

The client application in this example is fairly simple. It sends a single datagram packet to the server indicating that the client would like to receive a quote of the moment. The client then waits for the server to send a datagram packet in response.

Two classes implement the server application: QuoteServer and QuoteServerThread. A single class implements the client application: QuoteClient.

Let's investigate these classes, starting with the class that contains the main method for the server application. Working With a Server-Side Application contains an applet version of the QuoteClient class.
**Running the Server and Client:**

After you've successfully compiled the server and the client programs, you run them. You have to run the server program first. Just use the Java interpreter and specify the QuoteServer class name.

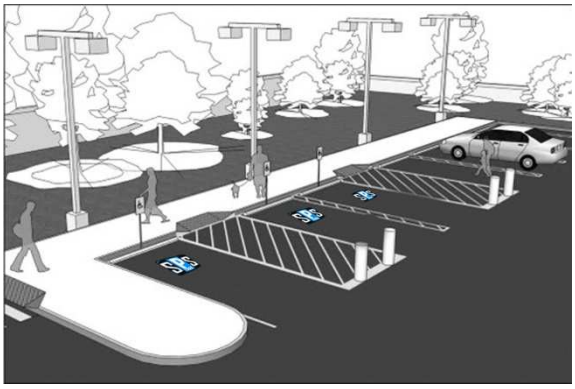
Once the server has started, you can run the client program. Remember to run the client program with one command-line argument: the name of the host on which the QuoteServer is running.

**SUMMARY**

**In Arabic :**

"Smart Parking System or SPS"

صمم هذا النظام لحل مشكلة البحث عن أحد المواقف الفارغة في الجامعة (أو أي منشأة في المستقبل)، من خلال جهاز متعقب الموقف



"Parking Detector"

وهو الجهاز الذي تم اختراعه لحل هذه المشكلة، تم تكوين الجهاز من عدت قطع الكترونية مبنيه على وحده التحكم

مفتوحة المصدر اردوينو

Arduino

تقوم فكرة هذا النظام على وضع الجهاز المذكور في الأعلى على كل موقف في الجامعة، وسيقوم الجهاز تلقائياً بالتعرف ما إذا كان هناك سيارة تشغل الحيز الموضوع عليه، من خلال حساب المسافة بين الأرض وبين السيارة.

ومن ثم سيتم نقل المعلومات الى خادم الويب لتحليل البيانات وارسالها للمستخدم من خلال منصتين الى الان، الا وهي الانترنت من خلال الصفحة التالية:

www.jazanu-sps.com

او من خلال تطبيق اندرويد المرفق في المتجر تحت مسمى

JAZANU SPS

ما ان يتم ولوج المستخدم الى أحد هذه المنصات، سيكون قادراً على التعرف وخلال ثواني معدودة ما إذا كان هناك موقف فارغ، مكانه،

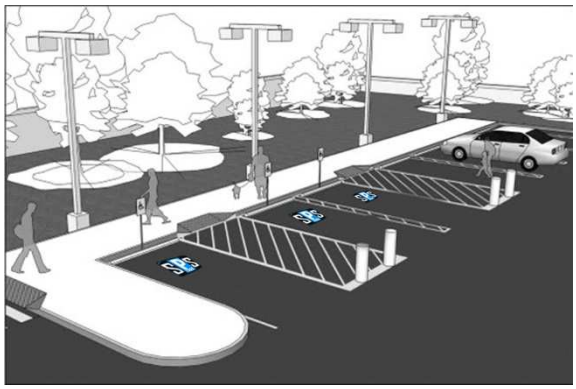
والطريق اليه من خلال واجهة برمجة التطبيقات

Google maps API

**In English :**

"Smart Parking System or SPS"

This system was designed to presents a solutions for the parking issue at the university campus or



any place in the future

"Parking Detector"

The device that we have invented to solve that issue

Arduino

The main idea of the project is to put a single unit on every parking at the university, so that the system will recognize wither there is a parked car on every single parking or not, the user can interact with system by vesting our website on the following link:

www.jazanu-sps.com


or by installing our app from android market(google play)

JAZANU SPS

Once the user logs in the system, he is going to able to see every free parking in the university,

and he also can get the directions to it

Google maps API

**LIMITATIONS:**

Some drawbacks of the SPS are as follows:

- Time Constraint.
- Financial Constraint.
- In case of server fails then the users also suffers.
- log in failed.

**RECOMMENDATIONS**

Although the system is kind of ready, there are several points to be considers in future for enhancement in general, the system could appreciate some classifications on the servers side so that it can distinguishes wither the user is staff or student, and the android stage is always under updates so keeping the app up-to-date is very important to meet the updated versions' requirements.

## 8. CONCLUSION

Smart Parking System is made by those students who struggle very enough to came with this idea of making programs that can help and assist there life in the future, by the help of Google Maps API and Arduino open development environment, we wore able to create our system to help the students in finding their parking so quickly and in a mater of time, the system is working so efficiently and performed that task that was expected from it to perform.

## References


- Bhatt, D.V.; Schulze, S.; Hancke, G.P.; "Secure Internet access to gateway using
- secure socket layer," vol.55, no.3, pp.793-800, June 2006
- Ming Xue; Changjun Zhu;"The Socket Programming and Software Design for
- Communication Based on Client/Server," PACCS '09. Pacific-Asia
- Conference on, vol., no., pp.775-777, 16-17 May 2009
- Shukla, A.; Brecht, Tim.;"TCP Connection Management Mechanisms for Improving Internet Server Performance,"1st IEEE Workshop on, vol., no.,pp.1-12, 13-14 Nov. 2006
- Zhenxing Liu; Lallie, H.S.; Lu Liu; Yongzhao Zhan; Kaigui Wu; , "A hash-based
- secure interface on plain connection.vol., no., pp.12-39, 17-19 Aug.2011
- Multithreaded Client/Server Application [http://www.ase.md/~aursu/ClientServerThreads.html]
- Client-server Chat
- [http://jerome.jouvie.free.fr/Java/Network/Tutorials/Tutorial2.php] (01/07/2010).
- James Martin, [1989], " Local Area Network Architecture and Implementations ".
- 2. H. L. Capron, [1996], " Computers Tools For an Information age ".
- Catalyst Development Corporation, [1999], " An Introduction To TCP/IP
- programming with windows sockets
- Charles L. Hedrick, [1987], " Introduction To Internet Protocols ".
- Novel Education, [1997], " Course 200 Networking Technologies "
- D. E. Comer, "Computer Networks and Internets," 5th Edition, Prentice Hall, 2008. [2] M. L. Liu,
- "Distributed Computing: Principles and Applications," Addison Wesley,2004
- Java API: http://download.oracle.com/javase/1.4.2/docs/api/
- http://en.wikipedia.org/wiki/Berkeley_sockets.
- James F. Kurose, Keith W. Ross, "Computer Networking: A TopDown Approach featuring the Internet".
- Joseph M. Dibella , "Socket Programming with Java"
- http://www.tutorialspoint.com/java/java_networking.htm
- The Java Tutorials, "Lesson: All about Sockets".
- Rajkumar Buyya, "Socket Programmin