SCFT

Surrogate City Finder Tool

Software Requirements Specification

Version 1

14/09/14

Team 46: Akanksha, Arushi Vashist, Ayush Tripathi, Dhruv Das, Siddharth Bhatore

ICS 261—Structured Systems Analysis and Design
Instructor: Prof. Raghu Reddy
Monsoon 2014

Revision History

Date	Description	Author	Comments
14/09/14	Version 1	Team	SRS version 1

Document Approval

The following Software Requirements Specification has been accepted and approved by the following:

Signature	Printed Name	Title	Date
	<Your Name>	Lead Software Eng.	
	A. David McKinnon	Instructor, CptS 322	

SCFT

1. Introduction

This section gives a scope description and overview of everything included in this SRS document. Also, the purpose for this document is described and a list of abbreviations and definitions is provided.1.1 Purpose
The purpose of this document is to give a detailed description of the requirements for the "Surrogate City Finder Tool (SCFT). It will illustrate the purpose and complete declaration for the development of system. It will also explain system constraints, interface and interactions with other external applications. This document is primarily intended to be proposed to the client for their approval of our understanding and implementation of the project as well as a reference for developing the first version of the system for the development team.

1.2 Scope

- Energy Plus Weather data files (.epw) contain exhaustive weather data for a city which utilized in simulations of the weather of a city for planning constructions and architectural modelling. Currently these files exist only for some cities of the world and (67 in India, to be precise).

- To facilitate the application of this model for the cities for whom weather data files have not yet been developed, we will make the 'Surrogate City Finder Tool' which finds weather data files of those cities around the world whose weather is the closest match to the city in
the question.

- The matching is done on the basis of parameters which induce similar weather conditions like Altitude , Latitude and Yearly Temperature Profile.

- The tool will display weather data files on a map of the world and the user will be able to make queries about specific cities and the tool will display the result on the map. The user will have an option of mailing results to their registered email Ids.

- We will be using Ruby on Rails web framework to develop a deployable web application and HTML, AJAX, CSS and Java scripting to provide a professional look to our WebApp.

1.3 Definitions, Acronyms, and Abbreviations

Definitions:

SCFT

Term	Definitions
User	Someone who interacts with the application
Admin/Administrator	System administrator who is given specific permission for managing and controlling the system
Web App/Tool	The tool that is developed to find surrogate cities

SCFT

1.4 References

To be added before R2.

1.5 Overview

The remaining SRS document shall contain initially a General Description followed by Specific Requirements, Analysis Models and Change Management Process. Each having a small explanation given in the beginning *a*nd *v*arious sub-parts to give a better and accurate description of our Application.

2. General Description

This section will give an overview of the whole system. The system will be explained in its context to show how the system interacts with other systems and introduce the basic functionality of it. It will also describe what type of stakeholders that will use the system and what functionality is available for each type. At last, the constraints and assumptions for the system will be prese
nted.

2.1 Product Perspective

This subsection of the SRS puts the product into perspective with other related products or projects. (See the IEEE Guide to SRS for more details).

2.2 Product Functions

To Avail the services of our app one needs to sign up and log in. Our Application hepls provide various Users getting weather data files of the cities that they have given as an input or weather data files of those cities that has a resemblance towards the city given as input.
This subsection of the SRS should provide a summary of the functions that the software will perform.

2.3 User Characteristics

Earthquake Engineering Professionals –Professionals who may want to use this tool to help them in weather assessment and modeling.
Weather Broadcast Companies–
Meteorology experts and Researchers – They know the domain best and will be the ones who will extensively use the City Finder tool.
Common man – They have the least knowledge about the domain, and also the software system. The user interface needs to be simple and appealing to this user.

3. Specific Requirements

3.1 External Interface Requirements

SCFT

This section provides a detailed description of all inputs into and outputs from the system. It also gives a description of the hardware, software and communication interfaces and provides basic prototypes of the user interface.

3.1.1 User interfaces

Main Page

3.1.2 Hardware Interfaces

Since neither the mobile application nor the web portal have any designated hardware, it does not have any direct hardware interfaces. This is a normal Web Application which will be hosted on a server and the database is picked directly from the Energy Plus databases.

3.1.3 Software Interfaces

SCFT

The tool interacts with the Energy Plus Database for weather data files. It retrieves the data files from the Database and displays the files on the map on the tool accordingly. The tool also uses the Google Map API for displaying an interactive world map within the tool and also uses the Google Map GeoCode API for locating places according to address on the map.

Programming languages – Ruby, Bash, JavaScript, Jquery, AJAX, Python

Web Framework(MVC) – Ruby on Rails
Development platform – VIM editor, Sublime Text 2, Linux Ubuntu 13.04/14.04
Collaboration and Version Control –Git
Project Documentation tools – LibreOffice, Creately.com (for USE CASE diagrams), Google Drive, Google Docs
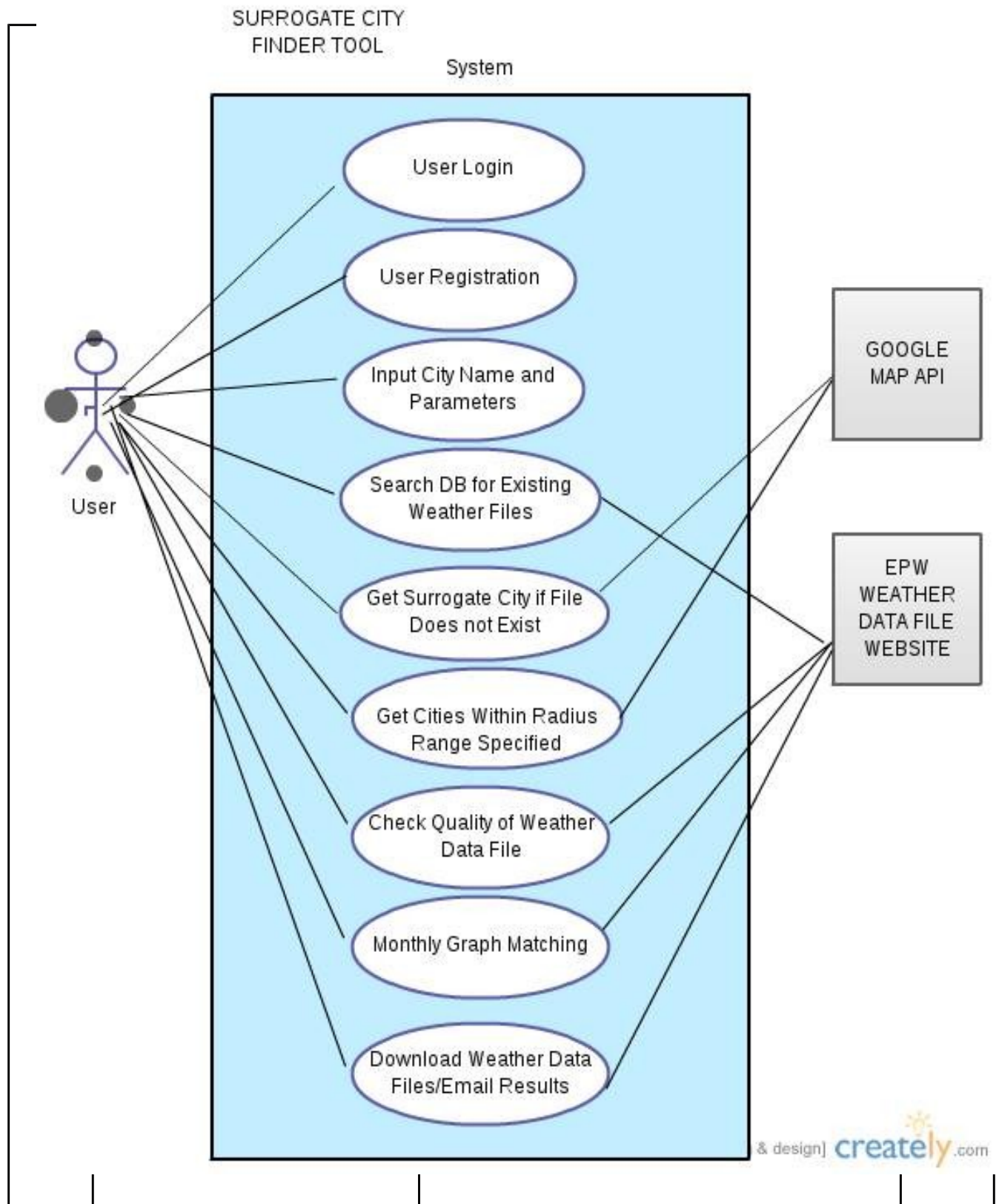
3.1.4 Communications Interfaces
The communication between the different parts of the system is important since they de
pend on each other. However, in what way the communication is achieved is not important for the system and is therefore handled by the underlying operating systems for the web application and the database and AP services.

3.2 Functional Requirements

SCFT

Use Case No.	Use Case Name	Brief Description	Release
1.	User login	A Login page will be implemented which will ask user for Email-Id and Password/Re-Type Password. The input will be validated with the information stored in the database and the user will directed to the main page.	R1
2.	User Registration	Create a database which will hold user information. The user information will have the following fields: a) Full Name b) Industry c) Job Title d) Email address e) Password f) Company Name	R1
3.	Profile View/Edit	User can view his profile which will show him his account details. It can be edited as per user's wish.	R1
4.	Display cities with weather data files.	A map will be marked displaying all the cities existing weather data files of cities.	R1
5.	Query data for a city	User will give a city name as input. Database will search weather data files for the input city. Result will show the weather details of the city if its file exists.	R1
6.	Parametric range input	The user will input the range for the latitude, altitude and temperature matching which it permits for matching cities to their surrogates	R2
7.	Obtain Surrogate cities and save result	The tool calculates result, displays the range band on the map and highlights the matching cities. The user has an option to save the result for the particular query.	R2
8.	E-mail the result	The result page can be emailed to the user's registered Email Id or email id of his choice.	R2
9.	Manage weather data files	The admin has options to manage the database of the weather data files and update it as more and more files become available.	R1
10.	Manage User accounts	The admin has CRUD options on User accounts.	R1

SURROGATE CITY
FINDER TOOL

System

User Login

User Registration

Input City Name and Parameters

Search DB for Existing Weather Files

Get Surrogate City if File Does not Exist

Get Cities Within Radius Range Specified

Check Quality of Weather Data File

Monthly Graph Matching

Download Weather Data Files/Email Results

User

GOOGLE MAP API

EPW WEATHER DATA FILE WEBSITE

& design] creately.com

3.3 Use Cases

3.3.1 Use Case #1

Use Case Number:	UC-01
Use Case Name:	User Login
Overview:	A Login page will be implemented which will ask user for Email-Id and Password/Re-Type Password. The input will be validated with the information stored in the database and the user will directed to the main page.
Actors:	1. User(Primary)
Pre condition:	The Application must be ready to take input from the User. The User Must Already be Registered.
Flow:	Main(success) flow: 1. A user Click on the Login button Present on the Homepage of the site. 2. The User is Redirected to the Login page. 3. User Enters his Details. 4. The Entered data is verified and found from the Database. 5. Profile Page of the user is Displayed for a successful Login, Otherwise the mismatching field is returned as a prompt to the User.

	Alternate Flow:
	
	 1.Incorrect login
	
	     1.1 The user enters incorrect e-mail or password.
	
	     1.2 An error message is displayed informing the user of the wrong login details.
	
	 2. E-mail not registered
	
	     2.1 The e-mail entered by the user is not present in the database
	
	     2.2 User is shown a message that the entered username is not registered yet.

Post Condition:	The User Must be redirected to the query page.

SCFT

3.3.2 Use Case #2

Use Case Number:	UC-02
Use Case Name:	User Registration
Overview:	A new user can register to the website creating his/her own profile in our database.
Actors:	First Time User.
Pre condition:	The Application must be ready to take Input from the New User.
Flow:	Main(success) flow: 1. A new User enters the Registration page by Clicking the Register Button present on the Main menu. 2.The user enters his/her details in the page and presses the submit button. 3.The data is checked for any redundancy and prompts the user for re-input if required. 4.The data entered by the user is stored in the database 5..A prompt displaying the success/failure of registrations

	Alternate flow:
	
	1.Username already exists
	
	      1.1 A message shown to the user to enter a different username.
	
	      1.2 User enters the username again.
	
	2.Password mismatch
	
	      2.1 A message is shown to user to re-enter the password fields
	
	      2.2 User enters the password and the re-type password fields
	
	3. Invalid e-mail id
	
	      3.1 A message is shown to the user to enter a valid e-mail id.
	
	      3.2 User enters the e-mail id field again

Post Condition:	The User Must be redirected to his profile page

SCFT

3.3.3 Use Case #3

Use Case Number:	UC-03
Use Case Name:	VIew/Edit Profile
Overview:	Any Registered User can View His/Her Profile and Edit it according to His/Her Requirement.
Actors:	1. User(Primary)
Pre condition:	User Needs to be Logged In.
Flow:	1. User Clicks on View/Edit Profile Button. 2. User is Directed to his/her Profile Page. 3. Edit Options like Change Password,Email Id etc will available on the Profile Page.
	Alternate flows: 1. If old Password does not match 1.1 An error will be displayed. 1.2 User will be asked to enter password again.
Post Condition:	1. User Will be directed to His Profile page. 2. If the User Changes his/her password or Email Id, the change is made in the database also.

SCFT

3.3.4 Use Case #4

Use Case Number:	UC-04
Use Case Name:	Display existing weather data files
Overview:	A map will be marked displaying all the cities with existing weather data files(Hidden initially).
Actors:	1. User(Primary)
Pre condition:	1. User is logged in. 2. All the weather data files are present in the database.
Flow:	1. Homepage of the site contains a map marked with the cities whose data files are present in the database(hidden initially). 2. The name of the cities are extracted from the data files present in the database and they are marked on the map using Google maps API.
	Alternate Flows:
Post Condition:	Success

SCFT

3.3.5 Use Case #5

Use Case Number:	UC-05
Use Case Name:	Query data for a city
Overview:	User will give a city name as input. Database will search weather data files for the input city. Result will show the weather details of the city if its file exists.
Actors:	1. User(Primary)
Pre condition:	1. User is Logged in. 2. City should be present in India..
Flow:	Main (success) Flow: 1. User gives an input city in the search box. 2. The Database is searched for the input. 3. Database returns all the data (max temp, min temp, altitude, co-ordinates etc.). It returns the weather data file of that city. 4. Result is Displayed on the page.
	Alternate Flows: 1. City not found in database 1.1. Redirect to user to UC-06
Post Condition:	1. Success

SCFT

3.3.6 Use Case #6

Use Case Number:	UC-06
Use Case Name:	Parametric Range Input
Overview:	The user will input the range for the latitude, altitude, radius and temperature matching which it permits for matching cities to their surrogates.
Actors:	1. User(Primary)
Pre condition:	1. Query(UC-05) is successfully completed.
Flow:	Main (success) Flow: 1 User is asked to input the parameters Latitude,Radius, Altitude, Max temp and Min temp(atleast one parameter should be non empty). 2 User is Directed to UC-07.
	Alternate Flows: 1. If all entries are empty, an error message will be showed to fill the vacnacies.
Post Condition:	1.User gets redirected to UC-07.

SCFT

3.3.7 Use Case #7

Use Case Number:	UC-07
Use Case Name:	Obtain Surrogate cities and save result
Overview:	The tool calculates result, displays the range band on the map and highlights the matching cities. The user has an option to save the result for the particular query.
Actors:	1. User(Primary)
Pre condition:	1.Success of UC-06 2.All other ranges will be initialised to NULL.
Flow:	Main Flow: 1. User will enter in the remaining parameters in the given space. 2. Depending on the latitude,Radius, MaxTemp, MinTemp and altitude range a search will be made to check the database for the weather data files. 3. Due to the latitude,Radius range, lines will be made on the map using google API marking the region to be searched. 4. All the Cities having weather Data files in this region will be checked using the remaining ranges to output the Result. 5. The Result is Displayed at the bottom of the page.

	Alternate Flows:
	
	1. If MaxTemp and MinTemp are not real numbers.
	
	   1.1. An error will be displayed.
	
	   1.2. User will be asked to input a number in the respective range.
	
	2. If Radius range is not a real numbers.
	
	   2.1 An error will be displayed.
	
	   2.2 User will be asked to input a number in the respective range.
	
	3. If the latitude range contains a value greater that +90 or less than -90.
	
	   3.1. An error will be displayed.
	
	   3.2. User will be asked to input a number in the range(-90 to +90).
	
	4. If No such City exists, a Message will be displayed at the bottom of the page showing the same.

Post Condition:	1. Success and User gets directed to UC-08.

SCFT

3.3.8 Use Case #8

Use Case Number:	UC-08
Use Case Name:	E-mail the result.
Overview:	The result page can be emailed to the user's registered Email Id.
Actors:	1. User(Primary)
Pre condition:	1. User has been redirected to the result page.
Flow:	Main flows: 1. An option will be provided to Mail the Result. 2. User may enter email id of his choice or simply mail it to the registered email. 3. Validity of the email address will be checked. 4. To get the registered email the database will be accessed.

	Alternate Flows:
	
	1. Invalid email address
	
	   1.1 An error will display the same.
	
	   1.2 User will be asked to enter email address again.
	
	2. Email sending failed
	
	   2.1 An error message displaying the same will be shown.

Post Condition:	On Success User must be redirected to the Home Page.

SCFT

3.3.9 Use Case #9

| Use Case Number:	UC-09
Use Case Name:	Manage weather data files
Overview:	The admin has options to manage the database of the weather data files and update it as more and more files become available.
Actors:	1. Admin(Primary)
Pre condition:	1.Admin must be logged in.
Flow:	Main(success) Flow: 1. An option will be present to redirect admin to update page. 2. Update Weather Data files. 3. Add Weather Data files.

	Alternate Flows:
	
	1. The Weather data file if not in the correct format.
	
	      1.1. An Error message will be displayed.
	
	      1.2. Admin will be redirected to Home page.

Post Condition:	1. Success.

SCFT

3.3.10 Use Case #10

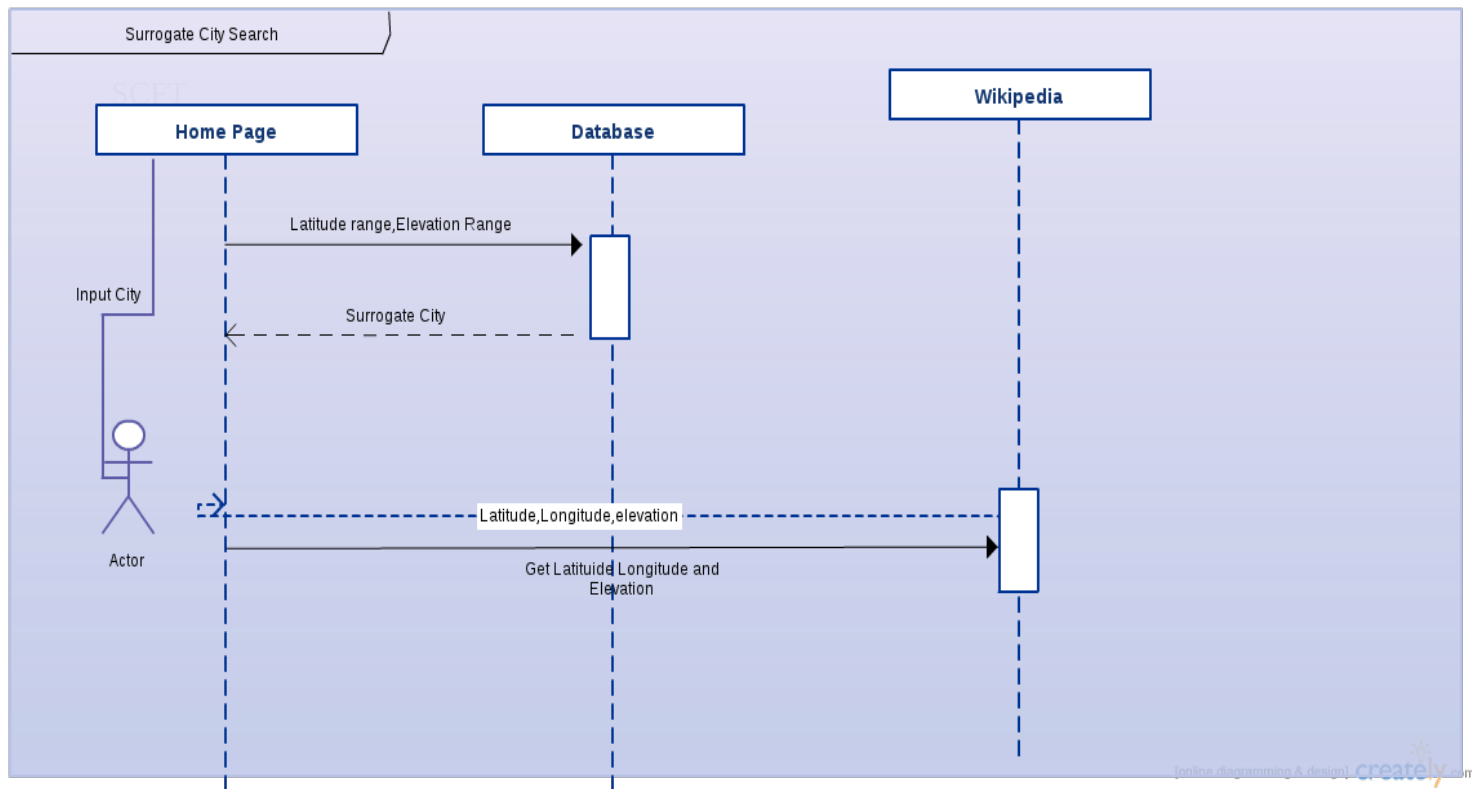| Use Case Number:	UC-10
Use Case Name:	Manage User accounts
Overview:	The admin has CRUD options on User accounts.
Actors:	1. Admin(Primary)
Pre condition:	1. Admin must be logged in.
Flow:	Main (success) Flow: 1. Admin has the privilege to see profile of all the registered Users. 2. He can delete the profile of a registered user. 3. Database will be updated on deletion.
	Alternate Flows:
Post Condition:	1. Success

…

3.4 Classes / Objects

SCFT
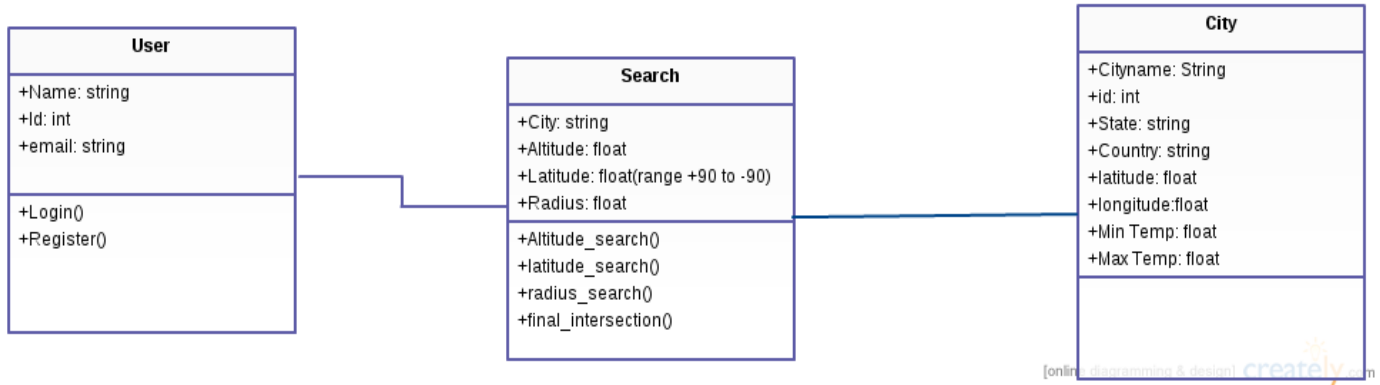
3.5 Non-Functional Requirements

1. Search should take less than five seconds.
2. Maintaining a professional look for the tool.
3. Developing User Friendly interface

4. Analysis Models

4.1 Sequence Diagrams

Surrogate City Search

Home Page · Database · Wikipedia

Latitude range,Elevation Range

Surrogate City

Input City

Actor

Latitude,Longitude,elevation

Get Latituide Longitude and Elevation

4.2 Component Diagram(CD)

Wikipedia page

Cities.rb
<<Model>>

Cities Database

Home_page.rb
<<Controller>>

CSS files

JS files

User.rb
<<Model>>

Users(login Register)
<<Controller>>

User database

[online diagramm]