

FINAL PRESENTATION SOFTWARE TO DESIGN AN OPTIMAL IRRIGATION SYSTEM- CAD System

BY
SPRINKLERHEADS

Overview

- Introduction
- Problem Description
- System Design
- Team Organization
- Demo
- Test Cases/Test Report
- Deployment Issues
- Process Model
- Technologies Used
- Things Learned/Future Work

Introduction

PROJECT DESCRIPTION:

Optimal irrigation system showing the appropriate placement of sprinkler heads, valves and pipe fittings on an Android device.

NEED FOR THE PROJECT:

- Existing applications such as Rain CAD are built for Desktop environment.
- Today's world is moving towards mobiles and tablets.
- Handy and can be used on site.

Problem Description

Irrigation System is expected to perform:

- Create either new project or open an existing one.
- Take input of all measurements from user.
- Save them to database.
- Draw basic shapes of the objects on the layout based on input.
- Edit shapes as required.
- Save as an image.
- Place the sprinkler heads and show their spray pattern.

Requirements Fulfilled

- Create a new project/design.
- Take all the required measurements from the user.
- Draw the basic layout of the property using the measurements.

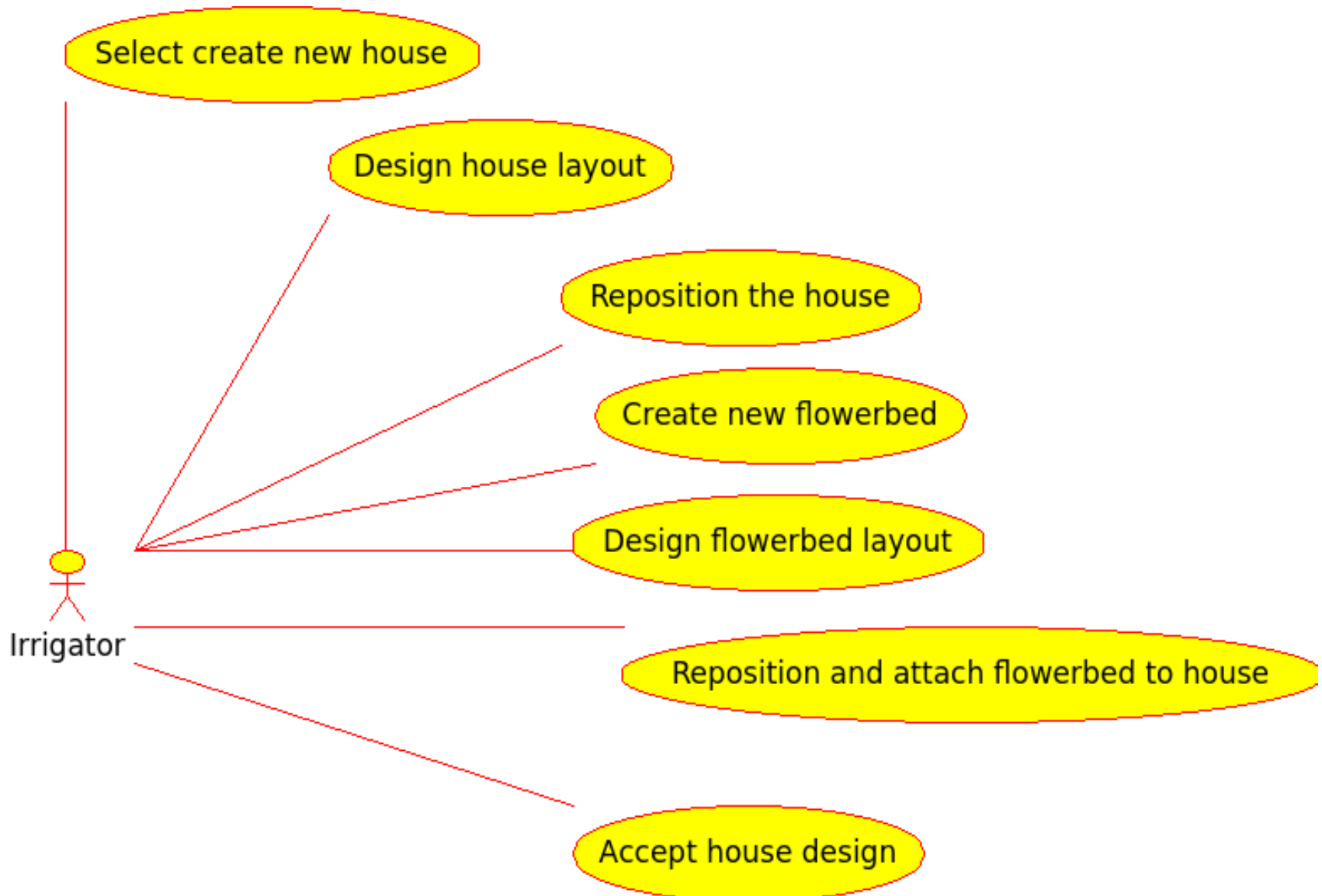
System Design

- Use Cases.
- ER Diagram.

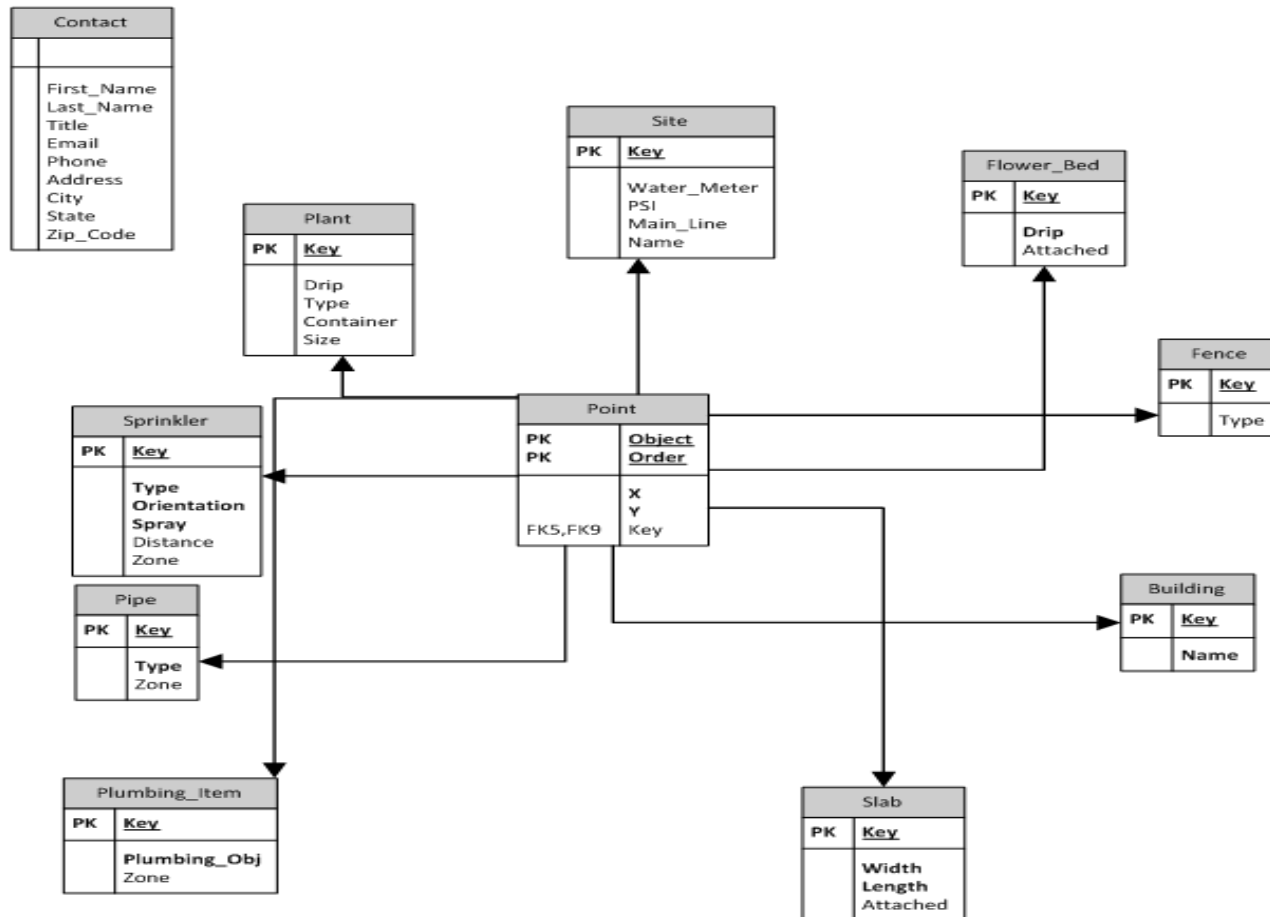
Use Case Diagram



Design House



ER Diagram



Technologies/Tools Used

- Eclipse
- OpenGL
- Mercurial Plugin (Tortoise hg) for version control (Bitbucket.org)
- Visio and Edraw
- SQLite3 database
- SQLite Maestro
- ORM Lite (dialect of Hibernate for persisting objects).



DEMO

Test Cases

Test case 1: Contact Table

turf_case_1.spr - Sqliteman

Schema | Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - Columns (3)
 - Indexes (0)
 - System Indexes ...
 - Triggers (0)
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)

Col: 1 Row: 1/1

Full View | Item View | Script Output

	First_Name	Last_Name	Title	Email	Phone	Address	City	State	Zip_Co
1	Turf	Case1	Tester	tester@sprinklerheads.com	940-555-9999	777 S. Watering St.	Wichita Falls	Texas	763

Query OK
Row(s) returned: 1

Sqlite: 3.7.9

Test case 1: Point Table

turf_case_1.spr - SqLiteMan

12:13 PM Paul



Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - Columns (3)
 - Indexes (0)
 - System Indexes ...
 - Triggers (0)
 - point
 - Columns (4)
 - Indexes (0)
 - System Indexes ...
 - Triggers (0)
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)



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Full View Item View Script Output

	Object	Order_Num	X	Y
1	1	1	0	0
2	1	2	200	0
3	1	3	200	400
4	1	4	0	400
5	2	1	170	10

Query OK
Row(s) returned: 5



Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - Columns (3)
 - Indexes (0)
 - System Indexes ...
 - Triggers (0)
 - point
 - Columns (4)
 - Indexes (0)
 - System Indexes ...
 - Triggers (0)
 - site
 - Columns (5)
 - Indexes (0)
 - System Indexes ...
 - Triggers (0)
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)

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Full View Item View Script Output

	KEY	Name	Water_Meter	PSI	Main_Line
1	1	Sprinkler Heads	2	61	1.125

Query OK
Row(s) returned: 1

Test Case 2: Contact Table

turf_case_2.spr - Sqliteman

12:43 PM Paul

Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)



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Full View Item View Script Output

	First_Name	Last_Name	Title	Email	Phone	Address	City	S
1	Turf	Case1	Tester	tester@sprinklerheads.com	940-555-9999	777 S. Watering St.	Wichita Falls	Te

Tester

Query OK
Row(s) returned: 1

Test Case 2: Plant Table

turf_case_2.spr - Sqliteman

12:44 PM Paul

Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)



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Full View Item View Script Output

	KEY	Drip	Type	Container	Size
1	3	No	Tree	1	12
2	4	No	Shrub	1	3
3	5	No	Perennials	1	1

Query OK
Row(s) returned: 3

Test Case 2: Point Table

turf_case_2.spr - Sqliteman

12:45 PM Paul

Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)

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Full View Item View Script Output

	Object	Order_Num	X	Y
1	1	1	0	
2	1	2	200	
3	1	3	200	40
4	1	4	0	40
5	2	1	170	1
6	3	1	180	36

Query OK
Row(s) returned: 8

Test Case 2: Site Table

turf_case_2.spr - Sqliteman

12:45 PM Paul

Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)



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Full View Item View Script Output

	KEY	Name	Water_Meter	PSI	Main_Line
1	1	Sprinkler Heads	2	61	1.125

Query OK
Row(s) returned: 1

Test Case 3: Contact Table

turf_case_3.spr - Sqliteman

12:47 PM Paul

Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)



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Full View Item View Script Output

	First_Name	Last_Name	Title	Email	Phone	Address	City	S
1	Turf	Case1	Tester	tester@sprinklerheads.com	940-555-9999	777 S. Watering St.	Wichita Falls	Te

Query OK
Row(s) returned: 1

Test Case 3: Flower Bed Table

turf_case_3.spr - Sqliteman

12:48 PM Paul

Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - Columns (2)
 - Indexes (0)
 - System Indexes (0)
 - Triggers (0)
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)

1

Col: 1 Row: 1/1

Full View Item View Script Output

	Key	Drip	Attached
1	7	No	

Query OK
Row(s) returned: 1

Test Case 3: Plant Table

turf_case_3.spr - Sqliteman

12:48 PM Paul

Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - Columns (2)
 - Indexes (0)
 - System Indexes (0)
 - Triggers (0)
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)

1

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Col: 1 Row: 1/1



Full View Item View Script Output

	KEY	Drip	Type	Container	Size
1	3	No	Tree	1	12
2	4	No	Shrub	1	3
3	5	No	Perennials	1	1

Query OK
Row(s) returned: 3

Test Case 3: Plant Table

turf_case_3.spr - Sqliteman

12:49 PM Paul

Schema Pragmas

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - Columns (2)
 - Indexes (0)
 - System Indexes (0)
 - Triggers (0)
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - Columns (3)
 - Indexes (0)
 - System Indexes (0)
 - Triggers (0)
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)



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Col: 1 Row: 1/1



Full View Item View Script Output

	Object	Order_Num	X	Y
1	1	1	0	
2	1	2	200	
3	1	3	200	40
4	1	1	0	40
5	2	1	170	1
6	3	1	180	36

Query OK
Row(s) returned: 16

Test Case 3: Site Table

turf_case_3.spr - Sqliteman

12:49 PM Paul

Schema Pragma

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - Columns (2)
 - Indexes (0)
 - System Indexes (0)
 - Triggers (0)
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - Columns (3)
 - Indexes (0)
 - System Indexes (0)
 - Triggers (0)
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)



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Full View Item View Script Output

	KEY	Name	Water_Meter	PSI	Main_Line
1	1	Sprinkler Heads	2	61	1.125

Query OK
Row(s) returned: 1

Test Case 3: Slab Table

turf_case_3.spr - Sqliteman

12:50 PM Paul

Schema Pragma

Database

- main
 - Tables (11)
 - building
 - contact
 - fence
 - Columns (2)
 - Indexes (0)
 - System Indexes (0)
 - Triggers (0)
 - flower_bed
 - pipe
 - plant
 - plumbing_item
 - Columns (3)
 - Indexes (0)
 - System Indexes (0)
 - Triggers (0)
 - point
 - site
 - slab
 - sprinkler
 - Views (0)
 - System Catalogue (1)



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Full View Item View Script Output

	KEY	Width	Length	Attached
1	6	200	3	{null}

Query OK
Row(s) returned: 1

Test Report

Known problems:

- Most of the requirements are not yet implemented.
- User input is not validated.
Invalid phone numbers, zip codes, and measurements are not checked.
- The object locations can overlap. No collision testing is implemented.

Known Problems (Continued)

- The ability to add plants has not been added.
- The ability to edit an existing design is not implemented.
- Placement of sprinkler heads is not implemented.
- Placement of pipes/valves is not implemented.

Test Report

Deviations:

- Not enough of the application has been implemented to deviate from the requirements.

Deployment Issues

- The .apk file will be given to the customer in a CD.
- May be copied to SDcard of android device by connection to a computer.
- It can be attached to email, or dropbox.
- Install .apk file in android device and run it.
- Sometimes application may not be properly installed.
- Application might crash.
- Most of the issues could be solve with reinstalling application.

Future Work

As the project is going to be continued by next semester students, they can do

- Moving of the objects on the plot.
- Calculating pressure levels.
- Placement of sprinkler heads/valves.
- Providing estimate of materials and installation costs.

What we have learned (continued...)

- Handling cursors and asynchronous threads .
- Learned how things work in android applications.
- Working in a group.
- Dividing of works and assigning tasks.
- Better time management.