

**COEN 275 - Object-Oriented Analysis, Design and Programming,**  
**Fall-2016**

**HummingBee Home Garden Sprinkler System**

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## **Acknowledgement**

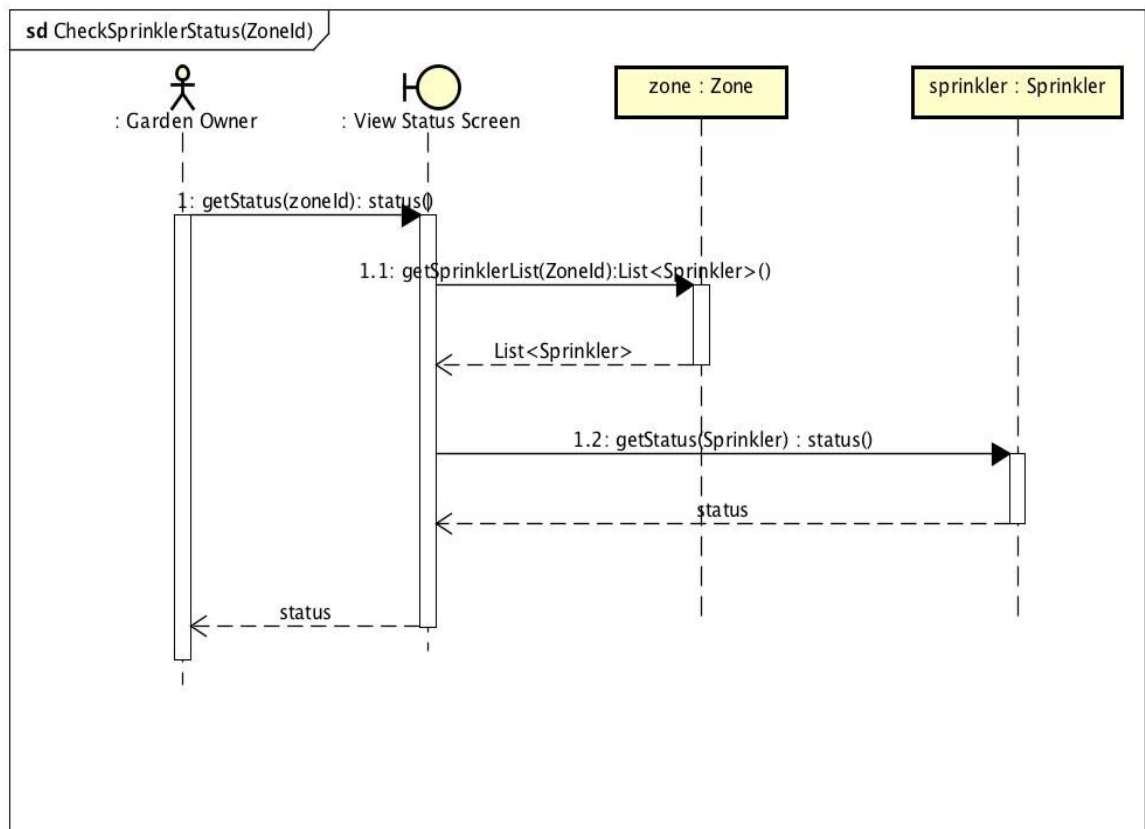
Our deepest thanks to Prof. Rani Mikkilineni for providing us the opportunity to embark on this project. We sincerely appreciate her guidance and encouragement in carrying out this project.

## 1. Introduction

*HummingBee Home Garden Sprinkler System* is an automated, microprocessor-based watering system for lawns and gardens. The system can be programmed to water the lawns and gardens at specified times and/or based on the daily temperatures.

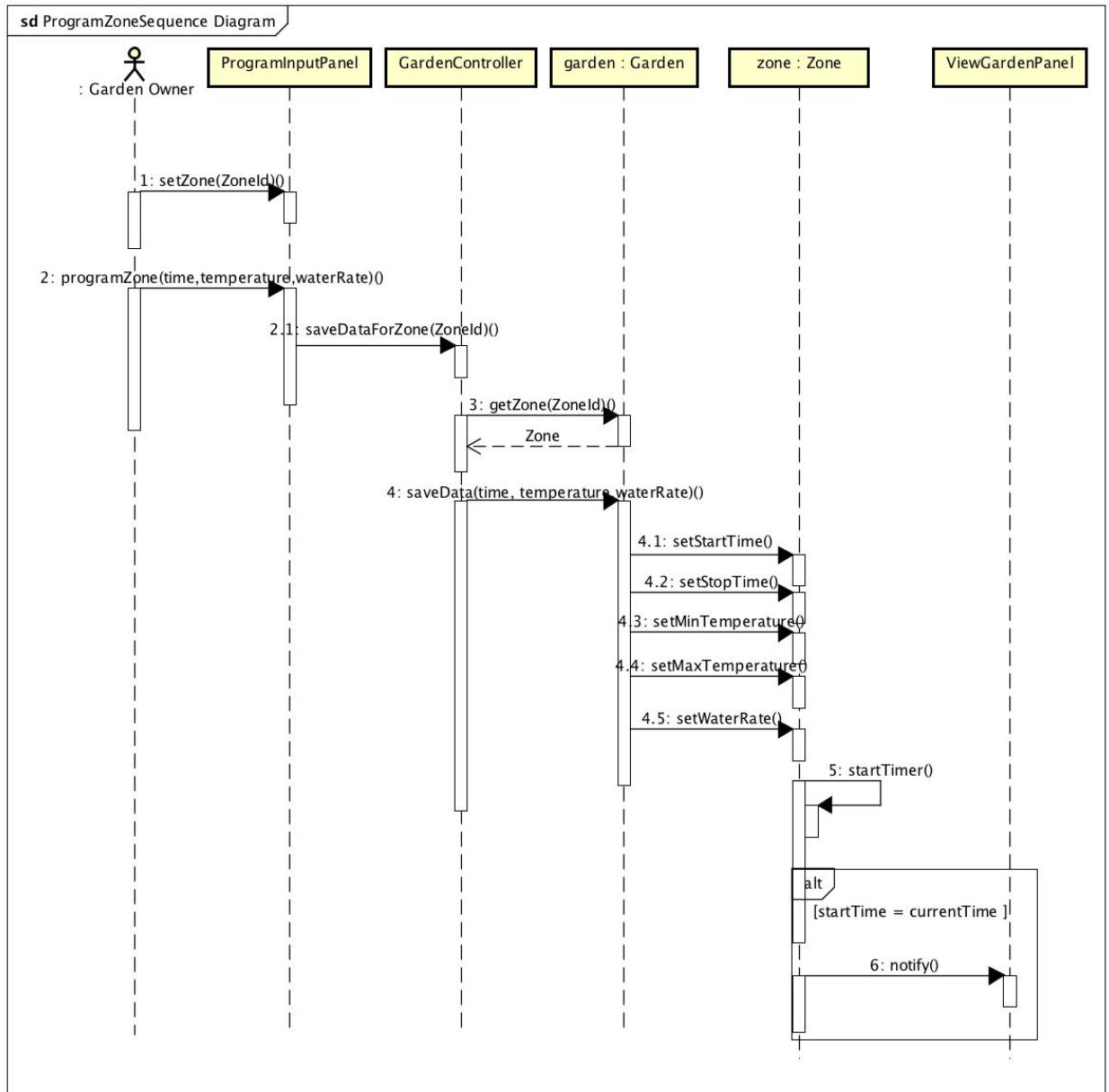
## 2. Sequence Diagrams

### 2.1 Check zone status

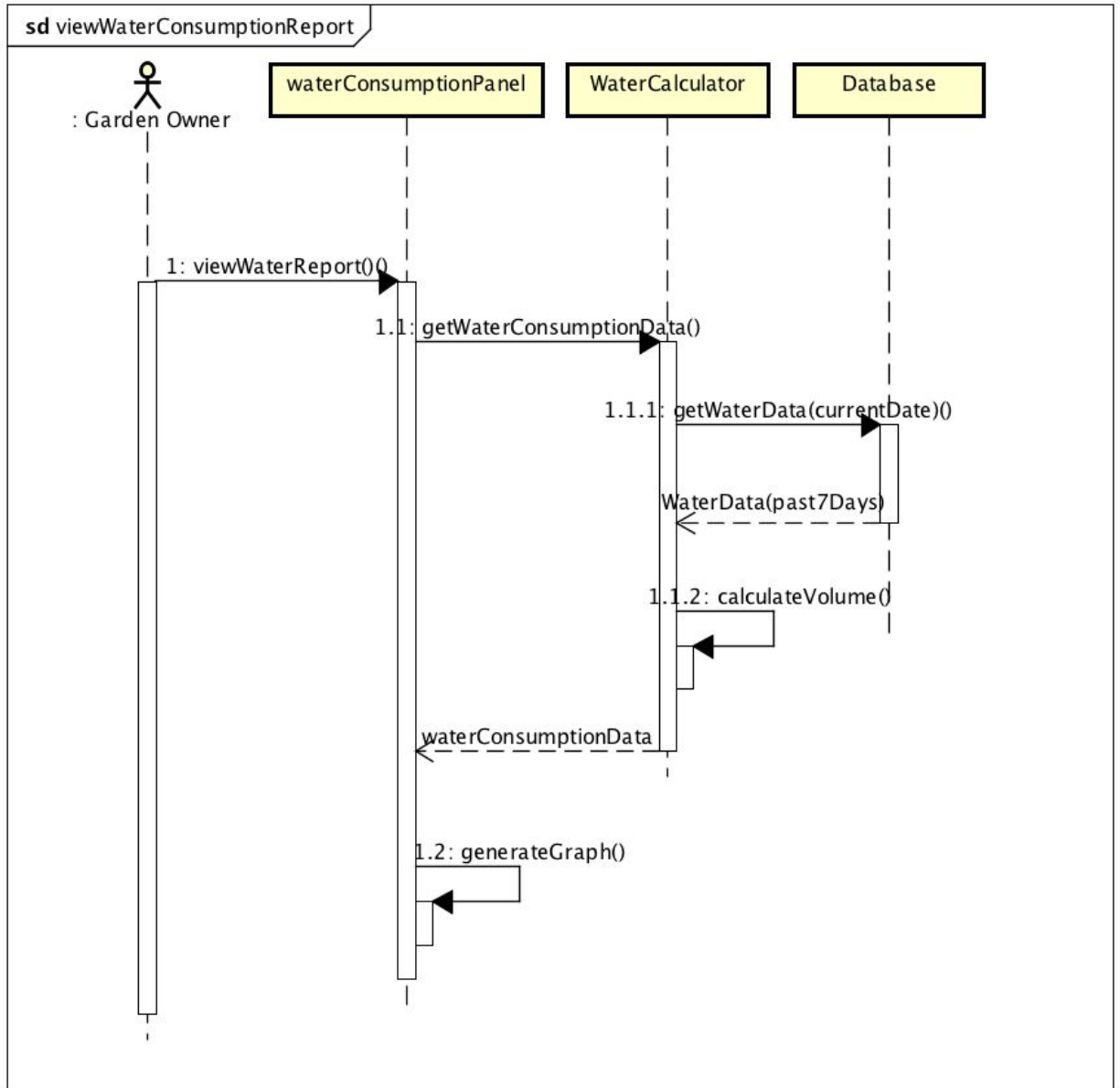


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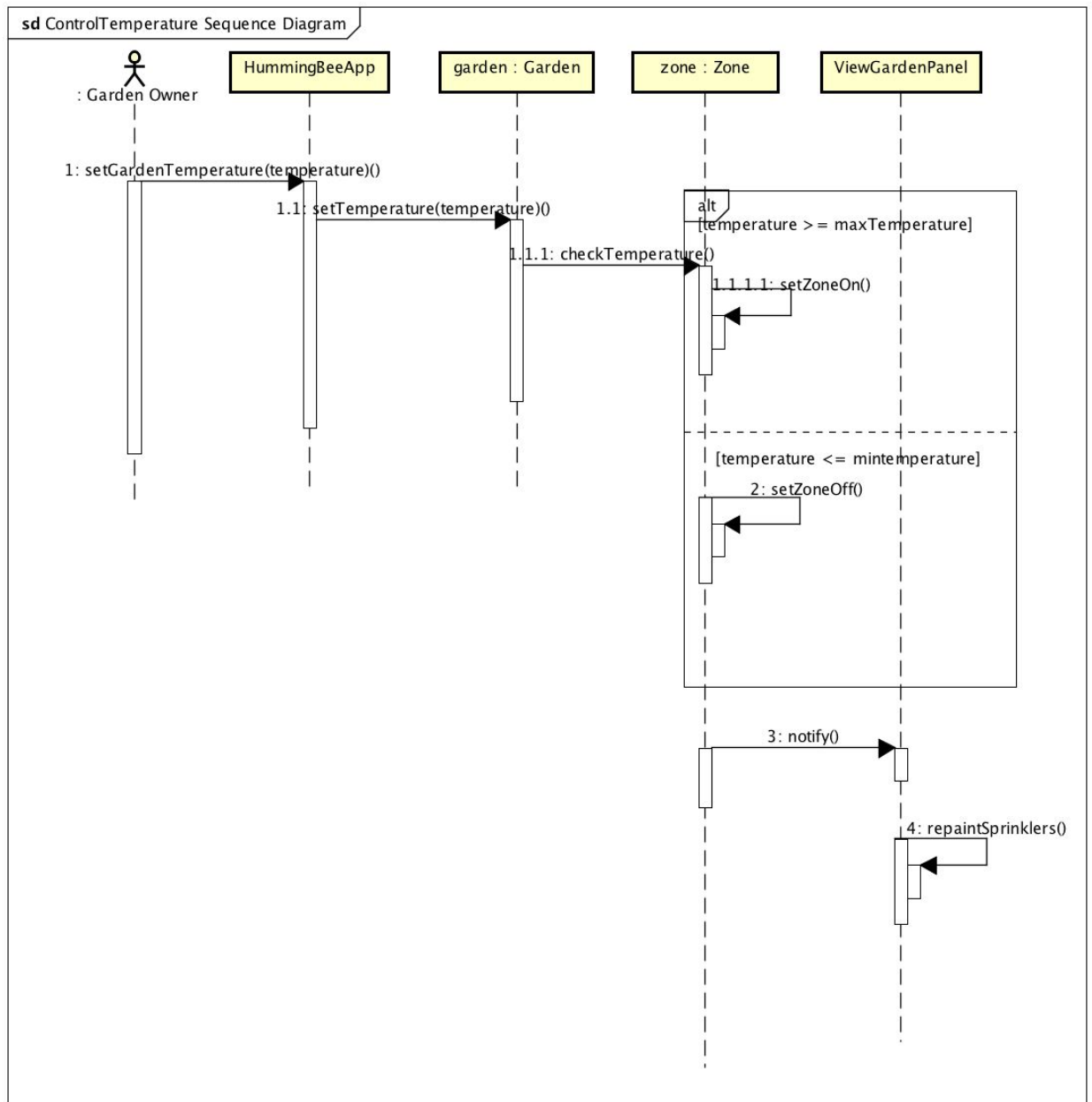
## 2.2 Program zone



## 2.3 View water consumption report



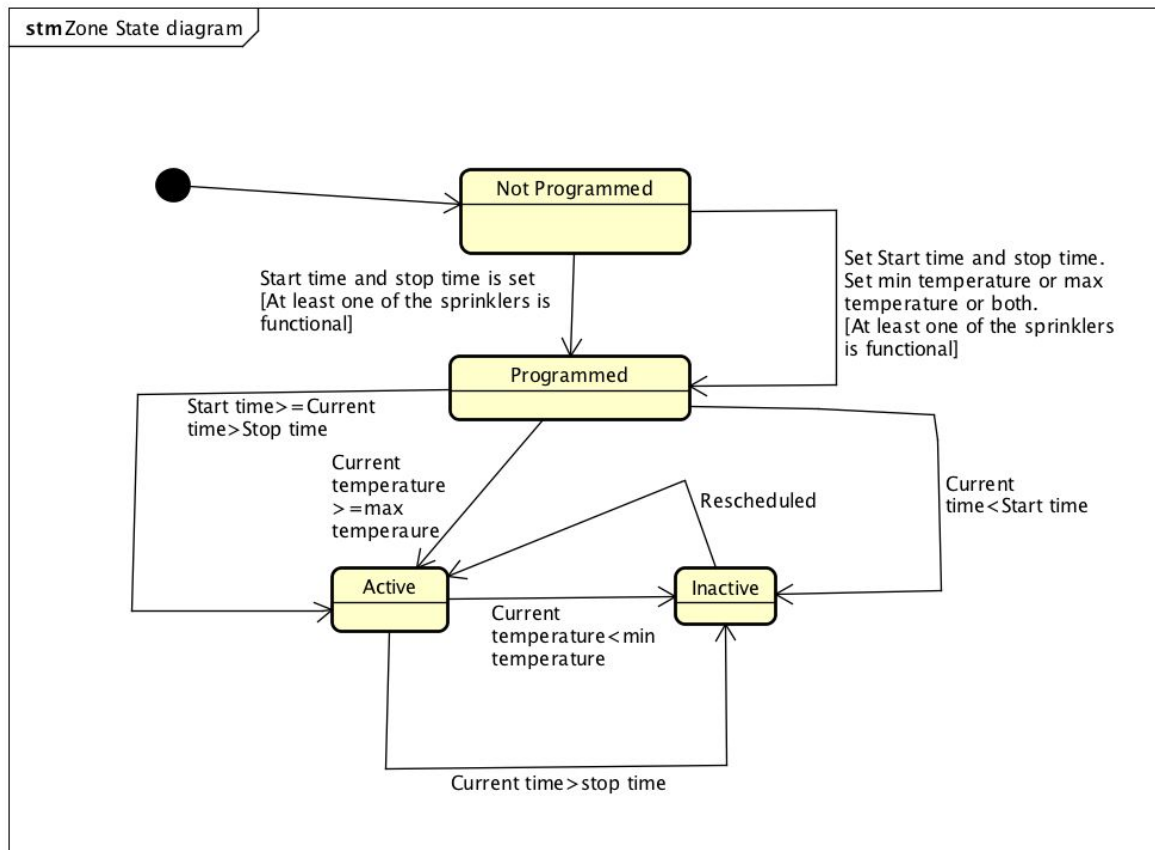
## 2.4 Control temperature



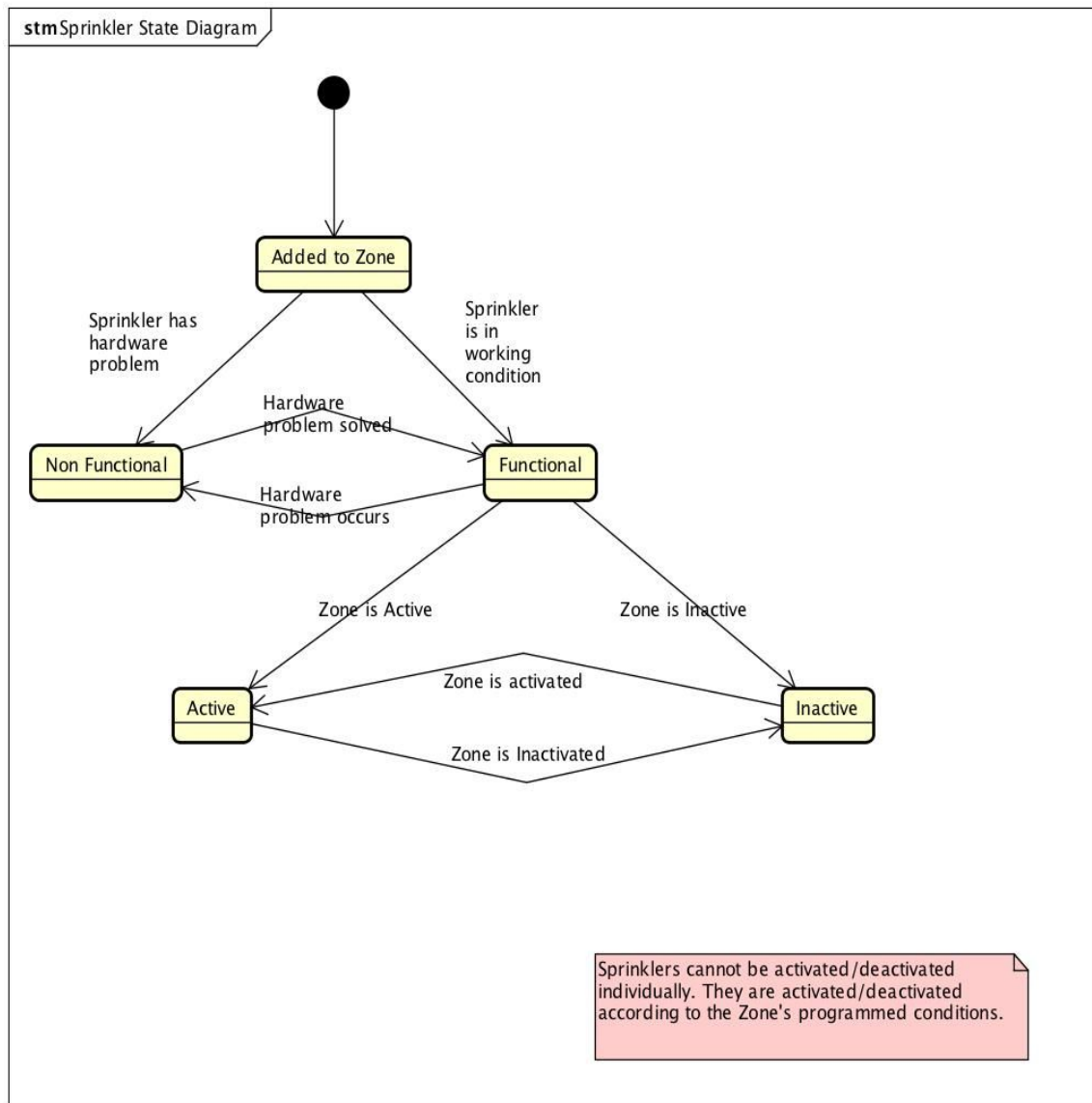


### 3. State Transition Diagram

#### 3.1 State diagram for Zone

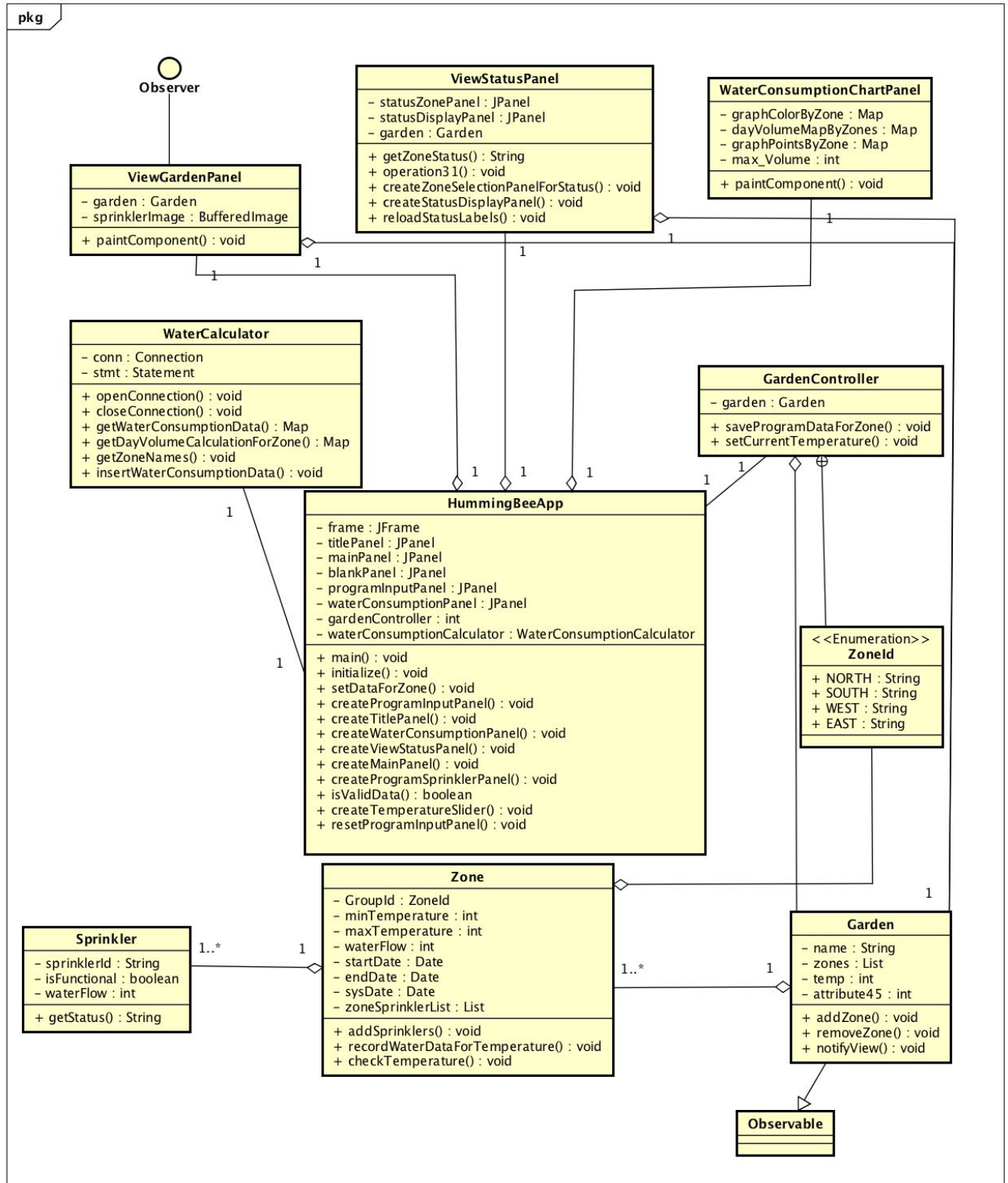


### 3.2 State diagram for Sprinkler

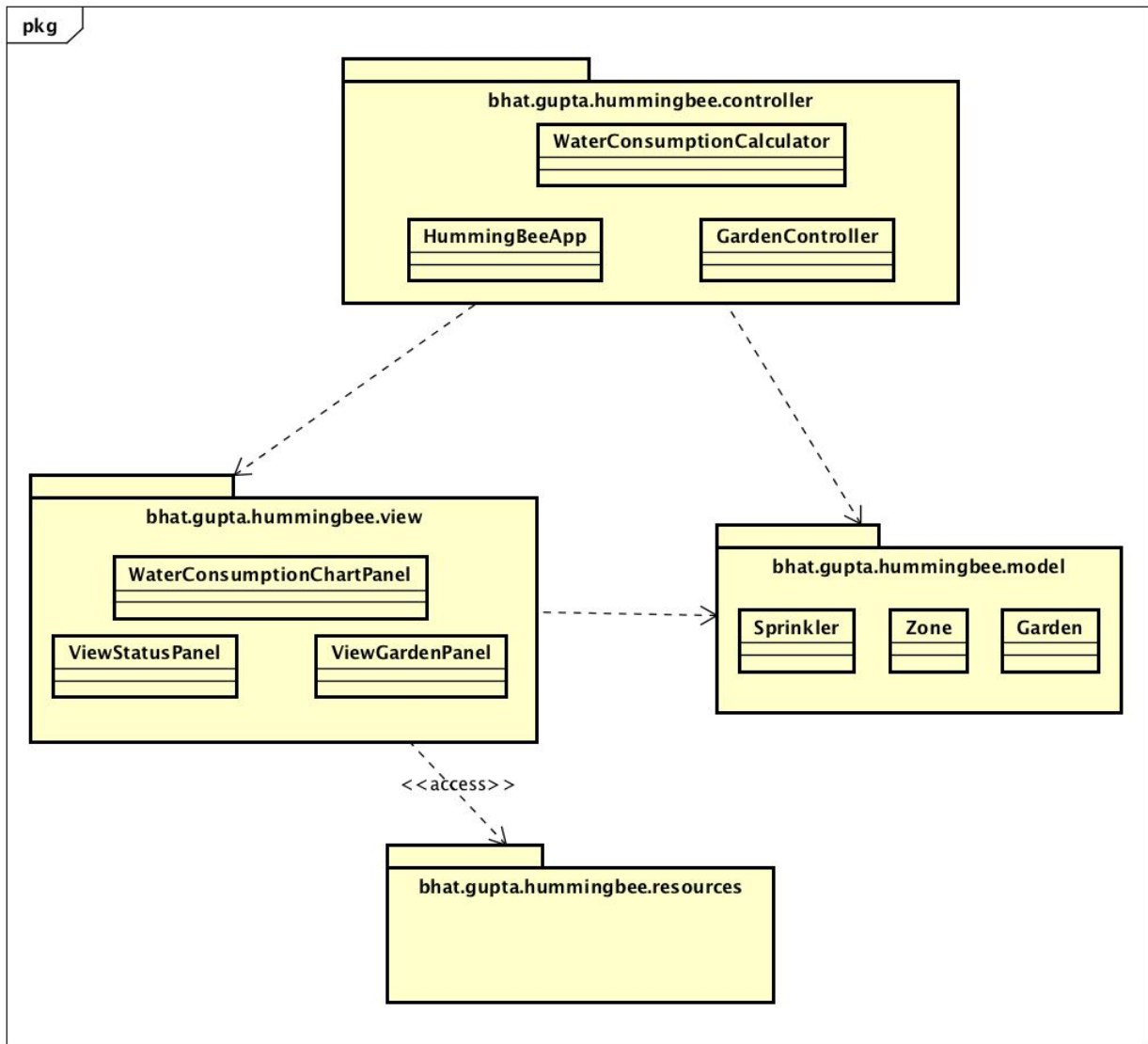


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#### 4. Class Diagram



## 5. Package Diagram



## 6. MySQL database 'db\_garden\_sprinkler\_sbsg'

### 6.1 Structure of 'tbl\_water\_consumption\_zonewise'

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
zone_id	varchar(20)	NO		NULL	
start_time	datetime	NO		NULL	
stop_time	datetime	NO		NULL	
rate_of_water_flow	int(11)	NO		NULL	

### 6.2 Snapshot of data in 'tbl\_water\_consumption\_zonewise'

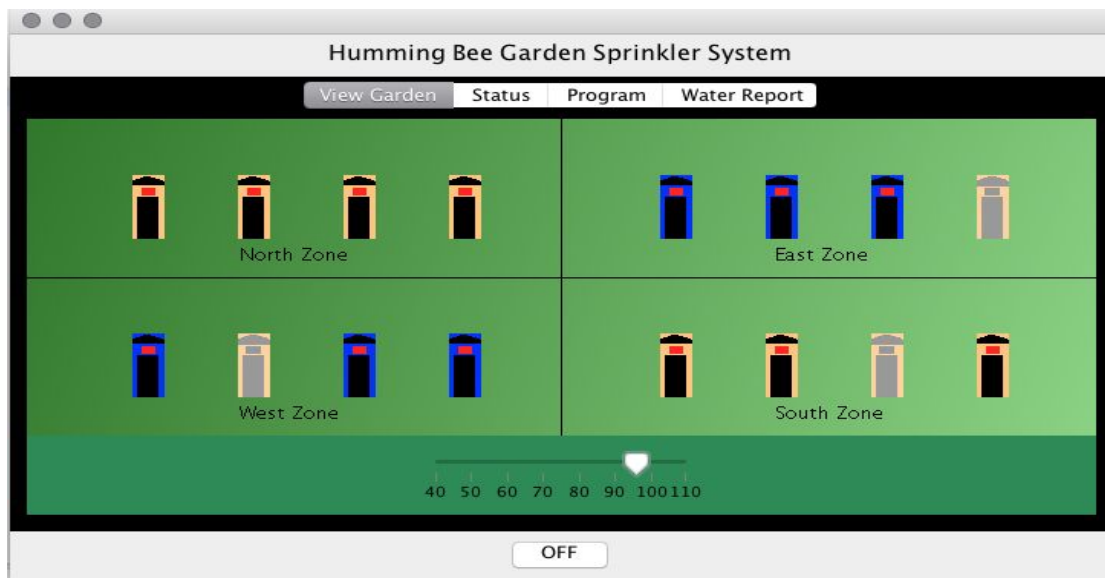
id	zone_id	start_time	stop_time	rate_of_water_flow
3	NORTH	2016-11-29 11:30:00	2016-11-29 11:32:00	10
4	WEST	2016-11-29 11:30:00	2016-11-29 11:32:00	20
5	EAST	2016-11-28 12:30:00	2016-11-28 12:31:00	10
6	WEST	2016-11-28 12:30:00	2016-11-28 12:31:00	10
7	NORTH	2016-11-28 12:30:00	2016-11-28 12:31:00	10
8	SOUTH	2016-11-28 12:30:00	2016-11-28 12:31:00	10
9	EAST	2016-11-27 12:30:00	2016-11-27 12:31:00	20
10	WEST	2016-11-27 12:31:00	2016-11-27 12:32:00	20
11	NORTH	2016-11-27 12:30:00	2016-11-27 12:31:00	20
12	SOUTH	2016-11-27 12:30:00	2016-11-27 12:32:00	20
13	EAST	2016-11-26 12:30:00	2016-11-26 12:31:00	20
14	WEST	2016-11-26 12:30:00	2016-11-26 12:32:00	40
15	NORTH	2016-11-26 10:30:00	2016-11-26 10:31:00	10
16	SOUTH	2016-11-26 10:31:00	2016-11-26 10:33:03	10
17	EAST	2016-11-25 12:30:00	2016-11-25 12:31:00	30
18	WEST	2016-11-25 12:30:00	2016-11-25 12:31:00	30
19	NORTH	2016-11-25 10:30:00	2016-11-25 10:31:00	20
20	SOUTH	2016-11-25 10:30:00	2016-11-25 10:32:00	20
21	EAST	2016-11-25 18:30:00	2016-11-25 18:30:30	20
22	WEST	2016-11-25 18:30:00	2016-11-25 18:30:45	30
23	NORTH	2016-11-25 17:30:00	2016-11-25 17:30:50	20
56	EAST	2016-11-30 10:02:00	2016-11-30 10:03:00	10
57	WEST	2016-11-30 02:02:00	2016-11-30 02:03:00	20
58	NORTH	2016-11-30 02:02:00	2016-11-30 02:04:00	10
59	SOUTH	2016-11-30 10:02:00	2016-11-30 10:03:00	20
62	EAST	2016-11-29 12:01:45	2016-11-29 12:02:45	40
63	SOUTH	2016-11-29 12:12:25	2016-11-29 12:13:25	30
79	SOUTH	2016-12-01 16:35:10	2016-12-01 16:36:10	50

## 7. Screenshots of the application:

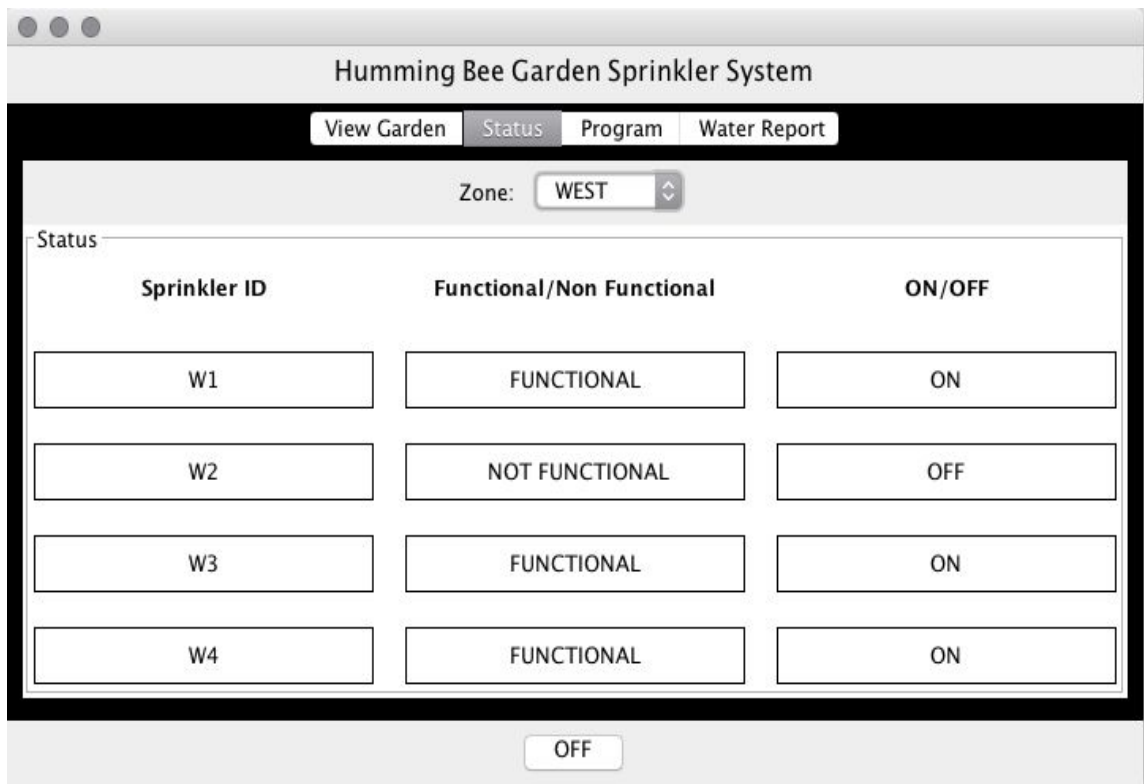
### 7.1 Disabled system



### 7.2 View Garden



### 7.3 View Zone status



The image shows a software interface for a 'Humming Bee Garden Sprinkler System'. At the top, there are four tabs: 'View Garden', 'Status' (which is selected), 'Program', and 'Water Report'. Below the tabs, there is a 'Zone:' label followed by a dropdown menu currently set to 'WEST'. The main area is titled 'Status' and contains a table with three columns: 'Sprinkler ID', 'Functional/Non Functional', and 'ON/OFF'. The table lists four sprinklers: W1 (Functional, ON), W2 (NOT FUNCTIONAL, OFF), W3 (Functional, ON), and W4 (Functional, ON). At the bottom of the interface, there is a large 'OFF' button.

Sprinkler ID	Functional/Non Functional	ON/OFF
W1	FUNCTIONAL	ON
W2	NOT FUNCTIONAL	OFF
W3	FUNCTIONAL	ON
W4	FUNCTIONAL	ON

OFF



## 7.4 Program zone

Humming Bee Garden Sprinkler System

View Garden Status **Program** Water Report

Zone: EAST

Time

Duration: Daily

Start Time (hh:mm): 10:00 Stop Time (hh:mm): 11:30

Temperature

Min Temperature (°F): 60 Max Temperature (°F): 80  
[Temperature range: 40 to 110]

Water

Water Flow (litres / hour): 30

Submit

OFF

## 7.5 View water consumption report

