Sim Traffic
Software Requirements Specification

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Product Description

SIM Traffic will be a puzzle game that simulates traffic situations. *SIM Traffic* will let users manage traffic by placing traffic lights, stop signs, and various objects in the road map and set the traffic light timers. *SIM Traffic* has different levels of difficulties that users have to complete before they can go to the next level. In order to accomplish the task, the user has to ensure that the number of cars that wait for too long does not exceed the limit which depends on the level of difficulties within a given amount of time.

This software is designed for people of all ages and people from all walks of life. In *SIM Traffic*, players control the traffic by managing various traffic objects. While a lot of work and thinking is put into setting up these objects, players will obtain satisfaction once they manage to come out with a working traffic system. One common approach that players may use to solve harder traffic scenarios is through a trial and error method. This will keep the players busy but entertained by trying out new things.

A lot people complain about how traffic signs are laid out, but not many people are aware of the fact that traffic management is complicated. By going through the game ranging from simple scenarios to difficult and complex real-world like scenarios, players will realize that real world traffic management can be even more difficult. Consequently, players may express more respect towards city planners and traffic engineers.

There are only few traffic planning games. Most of those that are related to road traffic usually do not focus on simulating or managing traffic. Instead, they are usually casual games which don't involve a lot of problem-solving thinking as we would experience in a typical simulation game. A good example of a typical traffic-related game is *Traffic Control*, a web-based game. Players' only role is to click on the traffic lights to change them from green to red, and vice versa, in order to keep the traffic flowing. It focuses more on other gameplay elements, such as user's reaction skills. Users of *SIM Traffic* have to take road conditions and traffic conditions into account to decide the time for traffic lights in each intersection to achieve the goal. This is much more intellectually challenging than *Traffic Control.*

Another similar game to *SIM Traffic* is *Traffic Giant. Traffic Giant* is a complex game and also requires problem-solving to create a working public transportation system. The graphics are really detailed but the UI is not clear to the user. For example, after adding a bus, the user cannot detect a new bus on the map and will not know what really happens, and the vehicles and pedestrians sometimes disappear and appear out of nowhere. *SIM Traffic* is more realistic and will have an intuitive and easy to understand user interface. Players can focus more on managing traffic and spend less time trying to find the right buttons to click.

To help users to be oriented with the game, they will be provided with a user manual and they can try the tutorial – level 0, which will guide them through the basics of the game.

Feature List

Feature List

FEATURE	STATUS
Bird's eye view	BETA
Road condition change as level of difficulty change	BETA
Tutorial level	~~BETA~~Feature-Complete
Simulate real traffic	BETA
Different car color represents the car's status	~~BETA~~Feature-Comlete
Restart the simulation	~~BETA~~BETA
Place/remove traffic signs	BETA
Navigate the map with scroll bar	BETA
Display of game status	BETA
Display of traffic sign status	BETA
Mini-map	~~BETA~~FINAL
~~Hot key~~	~~FINAL~~
Save/Load the level	FINAL
View traffic signs status during simulation	FINAL
Navigate the map with hand cursor	FINAL
Navigate the map by using mini-map	FINAL
Pop-up window for traffic light configuration	~~FINAL~~BETA
Fast-forward	FINAL
Stop Signs	FINAL
Pop-up window for picking various kinds of traffic signs	FINAL
Game over / level transition window	FINAL
Bus route handler	STRETCH
User name for saving	STRETCH
Different type of vehicles	STRETCH
Zoom in / zoom out by using mouse scroll wheel	STRETCH
Map creator	STRETCH

Group Dynamics

Each of our member is assigned to some roles as the following. The reason for choosing each role is also listed below each assignment.

<u>Feature List</u>
Project Manager – Angela
The project manager will have ultimate responsibility for the overall progress of the project. This

includes making sure the team meets the deadlines and the final product satisfies the requirements.

Game Designer – Lu Sien
Game designer is a person who designs gameplay and decide the structures of the game. Since our product is a game, having someone exclusively for designing the gameplay is important.

UI Designer – Jonathan
We need the UI designer because a user-friendly UI design will enhance the players' experience with the game. UI plays a crucial role in the software that's why we want a person to be in charge of it.

Lead Developer – Steven
The lead developer will oversee the work done by the developers and is also responsible for the underlying architecture of the software.

Lead Tester - Lisa
We choose to include a lead tester in our team because we need someone to coordinate the testers such that testing can be performed more efficientlyWe choose to include a lead tester in our team because we need someone to coordinate the testers such that testing can be performed more efficiently.

Integrators – Everyone
Programmers – Everyone
Testers – Everyone

The roles will differ for different parts of the projects because we only have five members in our team and all of us will be programmers, integrators and testers at different stages, and each of our members is assigned to a specific leading role and takes responsibility for that part of the project. If a disagreement occurs, we will list all the advantages and the disadvantages, and then we will make a decision based on those.

Software Toolset

Programming Language	: Python
API	: PyGame and
PGUor GTK	
Bug Tracker	: Google Spreadsheet
Version Control	: SVN
IDE	: Eclipse with Python plug-inNone

Schedule

Task Milestone	Estimated Effort	Date Due	Personnel/Subgroup
Paper Prototype	3 days	Friday, 04/17/09	All
Learn Python	2 days	Sunday, 04/19/09	All
Set up MS Project	1 day	Sunday, 04/19/09	Angela
Polish Game Design	1 day	Monday, 04/20/09	Lu Sien, Steven, Angela
Polish UI Design	1 day	Monday, 04/20/09	Jonathan, Lisa
Cars logic/algorithm	3 days	Thursday, 04/23/09	Lu Sien, Steven, Angela
Design software structure	3 days	Thursday, 04/23/09	All
Set up SVN/IDE/BugTracker	1 day	Thursday, 04/23/09	Steven, Jonathan, Lisa
Design maps for levels	1 day	Friday, 04/24/09	Lu Sien, Steven, Angela
Implement car logic	3 days	Monday, 04/27/09	Lu Sien, Steven
Implement the levels	3 days	Monday, 04/27/09	Lisa, Jonathan, Angela
Implement the objects	3 days	Thursday, 04/30/09	Angela, Lisa
Implement game rules	3 days	Thursday, 04/30/09	Lu Sien, Jonathan, Steven
UI: Frames	1 day	Friday, 05/01/09	Lu Sien, Angela, Lisa
UI: Display Info	1 day	Friday, 05/01/09	Jonathan, Steven
UI: Object Details	2 days	Sunday, 05/03/09	Angela, Lu Sien, Jonathan
UI: Minimap	3 days	Monday, 05/04/09	Steven, Lisa, Lu Sien
Event Handling	2 days	Wednesday, 05/06/09	Lisa, Angela, Lu Sien
Integration	3 days	Monday, 05/11/09	All
Testing	3 days	Thursday, 05/14/09	All
Beta Release		**Thursday, ~~05/14/09~~5/15/09**	**All**
User Feedback	~~1~~ 2 day	~~Friday, 05/15/09~~ Monday,	All
Improve based on user feedback	~~2~~ 44 days	~~Sunday, 05/17/09 Tuesday~~Friday, 05/~~19~~22/09	All
Implement pick sign pop up window	2 days	Thursday, 05/22/09	Lu Sien
Implement stop sign	2 days	Friday, 05/22/09	Lu Sien
Vehicle intersection logic	3 days	Friday, 05/22/09	Angela
Feature-Complete Release	1 day	Friday, 05/22/09	All
Implement final features	~~5~~ 7 days	Friday, 05/~~22~~29/09	All
Release candidate	1 day	Friday, 05/29/09	All
Testing/ Final check / stretch	~~3~~ 4 days	~~Monday, 05/25/09~~ Friday, 05/29/09	All
Final Release		~~**Monday, 05/25/09**~~ **Wednesday, 06/03/09**	**All**

Schedule

Risks Summary

Risk	Chance of Occurrence	Impact	Steps to Reduce the Risk	Anticipation
Unable to meet deadlines	Medium	High	• Better schedule organization	• Reduce the final features • Make sure that the basic features are completed
Lack of	Medium	High	• More time to learn about	• Use other

knowledge / experience with the tools / languages being used			the tools / languages	framework / language that this more adaptable
Clients request for more final features	Medium	Medium	• More communication with the clients • More discussion with the project members	• Try to fit in the request in our schedule
User unable to use the software	Low	High	• Have level 0 for tutorial level • Written manual	• Provide support contact information • FAQ

Unable to meet deadline
Being unable to meet the deadline will have the biggest impact for the project team as we will not be able finish implementing the requirements. It may worsen the performance of the software significantly and surely affect the overall quality of the software.

Lack of knowledge / experience with the tools / languages being used
Team member's lacking knowledge of the tools or languages will also have a high impact on the project. It may reduce the quality of the software and slow the other members down. The worst case scenario is that we may have to change the framework, the programming language, or any other tools that we use in the middle of our progress. In that case, we will have to redo the work that we have done so far and it will most likely lead to the risk of not being able to meet the deadline.
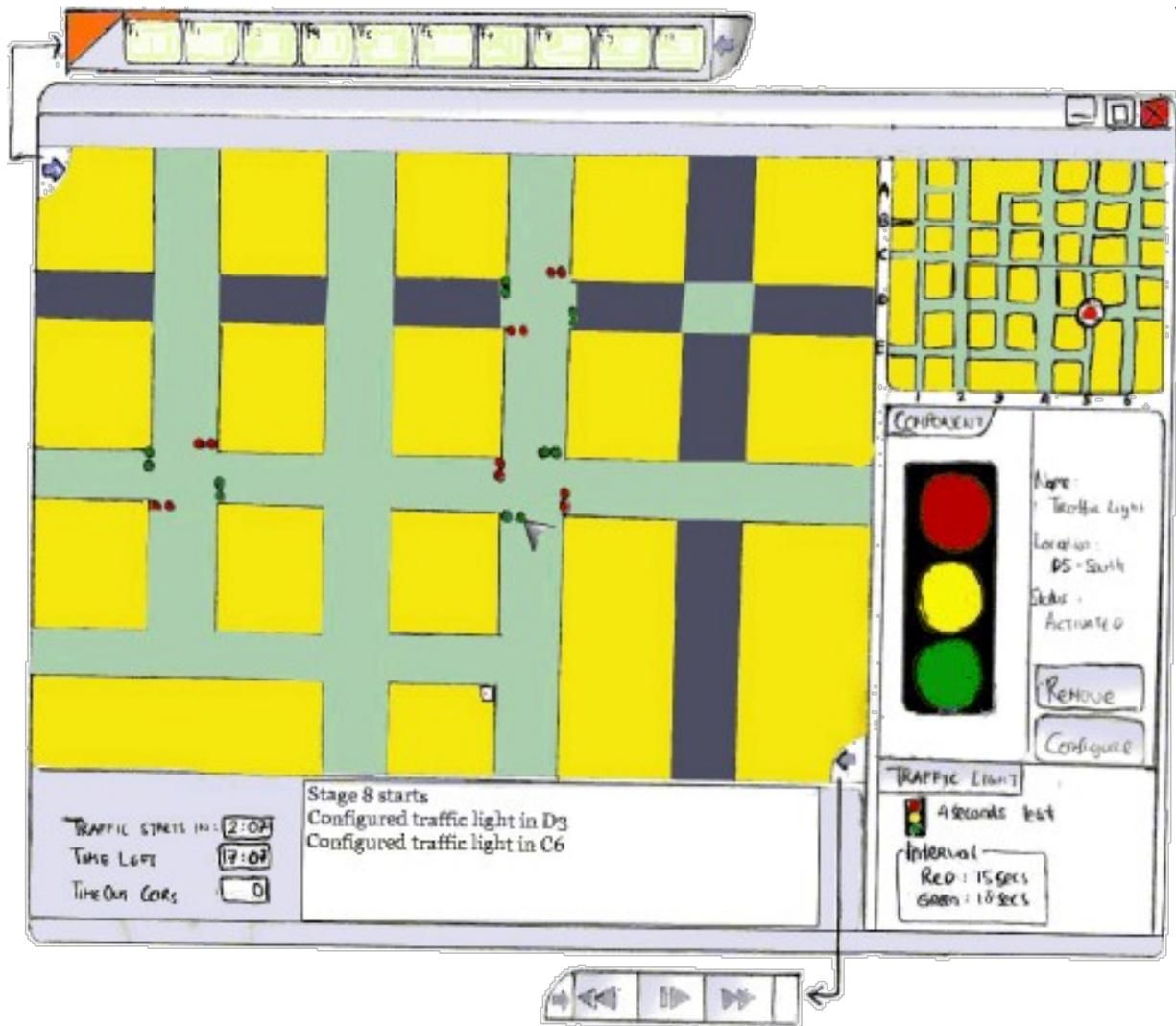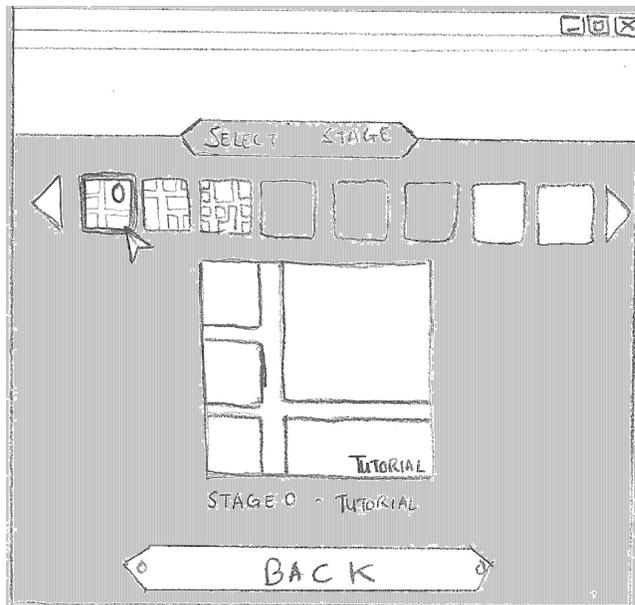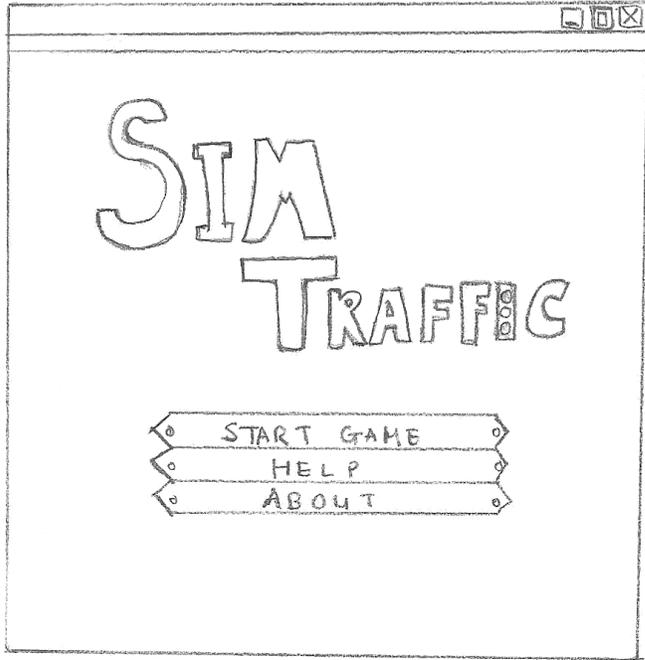
Clients request for more final features
Since clients' satisfaction is our highest priority, we intend to try our best to allocate enough time to implement all extra features that are requested by the clients. This will require us to estimate the extra time needed to implement the requested features and we may need to reschedule since it may interfere with our original plan.

User unable to use the software
Not being able to use the software will have a very big impact for the user. However, this case will rarely occur because there will be a written manual and tutorial for user help.

For risk reduction, getting feedback from users after paper prototype, beta release, and final release will be the most useful. Paper prototype will provide us with an early feedback, hence ensures that our UI meets the players' preferences. User feedback after beta release offers information about possible bugs and what features we might want to modify or add for our final release. Lastly, user feedback after the final release will again help us in catching bugs and direct us in designing upcoming extensions for our product.

Stage 8 starts
Configured traffic light in D3
Configured traffic light in C6

TRAFFIC STARTS IN: 2:07
TIME LEFT 17:07
TIMEOUT CARS 0

CONFIGURE IT

Name:
Traffic Light

Location:
D5 - South

Status:
Activated

Remove

Configure

TRAFFIC LIGHT

4 seconds left

Interval
Red : 15 secs
Green : 18 secs

SIM TRAFFIC

- START GAME
- HELP
- ABOUT

SELECT STAGE

TUTORIAL

STAGE 0 - TUTORIAL

BACK

Use Cases

Use Case (Placing the Traffic Signs)

Goal	User wants to place a traffic sign on an intersection
Primary Actor	User
Scope	Game System
Level	User
Precondition	User is currently in the game
Success End Condition	Traffic sign is placed and timer for traffic light is set
Failure End Condition	Traffic sign is not placed
Trigger	User clicks on an intersection
Main Success Scenario	1. User clicks on the intersection 2. System presents ~~component~~ pick sign window 3. Choose a type of traffic signs to be placed 4. Set the timer, if traffic light is chosen 5. System places the traffic sign on the chosen intersection along with its pairs (eg traffic signs will be placed on all intersection cells in the same intersection block)

Extensions (Error Scenarios)	4a. Timer is not set
	    4a.1. The intersection will be shaded
	    4a.2. Assume there is no traffic signs on that intersection
	4b. Insert negative number for the timer
	    4b.1. System presents a warning message on the game status display
	    4b.2. User re-enter the time

Variations (Alternative Scenarios)	1a. User presses a hot key to choose an intersection

Use Case (Setting the Hotkey)

Goal	Setting up the hot key
Primary Actor	User
Scope	User Interface
Level	User
Precondition	User is currently in the game
Success End Condition	Hot key is saved
Failure End Condition	Hot key is not saved
Trigger	User clicks on an intersection
Main Success Scenario	1. User clicks on a traffic sign 2. User presses CTRL + [F1-F10] 3. This hot key is now mapped to chosen traffic sign
Extensions (Error Scenarios)	2a. User hasn't select either an intersection or traffic sign 3a.1. Hot key won't be saved
Variations (Alternative Scenarios)	2b. The hot key has been used 2b.1. The hot key will be replaced

Use Case (Removing Traffic Sign)

Goal	Removing traffic sign
Primary Actor	User
Scope	Game System
Level	User
Precondition	User is currently in the game
Success End Condition	Traffic sign is successfully removed
Failure End Condition	Traffic sign is not removed
Trigger	User clicks on an intersection
Main Success Scenario	1. User clicks on ~~a traffic sign~~ an intersection cell 2. The information of the corresponding traffic sign will be shown in the component window 3. User clicks on remove button 4. The chosen traffic sign is now removed

Extensions (Error Scenarios)	1a. User doesn't click on an intersection
	    1a.1. Nothing will happen
	1b. There's no traffic sign on the intersection
	    1b.1. Component window won't appear

Variations (Alternative Scenarios)	None

Use Case (Changing the Traffic Light's Timer)

Goal	Changing the timer for traffic light
Primary Actor	User
Scope	Game System
Level	User
Precondition	User is currently in the game
Success End Condition	The changed timer will be saved
Failure End Condition	The timer won't be changed
Trigger	User clicks on an intersection
Main Success Scenario	1. User clicks on a~~n~~ intersection cell containing traffic light 2. User clicks on configure 3. Traffic light configuration window will appear ~~2. Traffic light window will appear~~ 4~~3~~. User ~~inserts~~ change timer for red and green lights for the chosen traffic light 5~~4~~. User clicks on the "okay" button 6~~5~~. Timer for this traffic light is now updated

Extensions (Error Scenarios)	1a. User does not click on a traffic light
	    1a.1. Nothing will happen, traffic light window won't present
	3a. User inserts negative number
	    3a.1. Warning message will appear on the game status display
	    3a.2. User retries to insert valid positive number

Variations (Alternative Scenarios)	4a. User presses "enter"

Our use cases cover the important scenarios of the game software because in order to complete the task, users need to place the traffic signs and set timer for them. For usability, user can also remove the traffic signs and use the hotkeys. And all these are included in our use cases.