UNTITLED CAR GAME
Main Design Document

Concept

Untitled Car Game is a navigation-based puzzle game. The player is trying to help guide a car driver through a network of roads. They can't drive the car directly, so they tell it where to go by arranging a set of short directions, like "turn right" and "continue straight until the end of the road", in the correct order. This concept was inspired by the everyday challenge of road navigation, and the intent of this game is to recontextualize that challenge in a simplified, enjoyable puzzle context that challenges the player's spatial reasoning and planning abilities.

Target Audience

The primary target audience is men in the age range of 25 and up. They're likely to enjoy puzzles based on navigation and spatial reasoning, and can relate to the experience of trying to find their way through unfamiliar roads. That said, the game will probably also appeal to some women and younger adults.

Level Select

Untitled Car Game's levels are arranged in tiers. The game has several worlds, and each world contains multiple puzzles.

Each world is characterized by a unique road map, the network of roads and intersections on which the car travels. Puzzles in the same world all use the same road map, but the positions of the destinations and what direction pieces the player have change. This gives the puzzles a minor element of parallelism, since players can get familiar with how to navigate a given road map in one puzzle, then apply that knowledge in other puzzles.

The full game contains 7 worlds and a total of 23 puzzles.

Player Goals

In each level, some of the landmarks on the road map are numbered and designated as destinations. The player's objective is to guide the car to all of the destinations in the level, in the order they're numbered. (Visiting a destination out of order is fine, but it won't count toward the objective.) The player doesn't control the car directly, though. Instead, they have a set of direction pieces that each give the car a simple instruction about where to go. To solve the puzzle, the player has to put the direction tiles in an order that brings the car to the destinations.

Controls

The player has two ways to directly control the puzzles. First, they drag direction pieces around. The player usually has between 4 and 6 direction pieces per level. The direction pieces are always arranged in a vertical line, but by clicking on them and sliding them up or down, the player can change the order the directions are in.

Once the player is happy with the sequence of the direction pieces, they can press the Drive button, which essentially equates to the player submitting their solution. After the button is

hit, the positions of the direction pieces are locked and the player's car will automatically start driving around the road map, following the direction pieces in the order that the player arranged them. At any point during the route, the player can hit the Drive button again (which changes to say "Cancel" instead of "Drive") to cancel the route and go back to moving direction pieces.

In addition to the puzzle interface, there's a button in each puzzle header that allows players to exit the puzzle and go back to the level select screen.

Movement Rules

When the player instructs the car to start moving, it checks the sequence the direction pieces are in. There's a special, immovable direction piece that always appears at the top of the direction list; this direction simply tells the car to start moving forward. After that, the player's direction pieces come into play. Each direction piece represents a direction, such as "go straight", "turn left", and "keep going straight until you reach the end of the road". As soon as the car has fulfilled the conditions of a direction piece, it will check the next piece and start looking for an opportunity to follow it.

Once the car has followed every direction piece, it can keep traveling down the road it's on until the next intersection. At that point, the car doesn't know where to go anymore and the route is over.

When the car reaches an intersection with a goal tile on it, *and* it has already gone through any lower-numbered goals, the goal tile is removed from the road map. It's okay for the car to go to a goal tile too early, but the goal tile stays on the map, and the car will have to come back to collect it later. If the car collects every goal tile in the before the route ends, the player has solved the puzzle.
If the route ends before the win state is fulfilled, the player is basically put back where they started-- they have to rethink the puzzle, put the direction pieces in a new order, and try again.

Art Direction

The game's art style is meant to mimic real navigational aids. The road maps, direction board, and various informational text boxes, in addition to the handwritten font, are supposed to look similar to scraps of paper. Meanwhile, the goal tiles, direction pieces, and buttons resemble road signs, break up the otherwise neutral color scheme and highlight important objects.
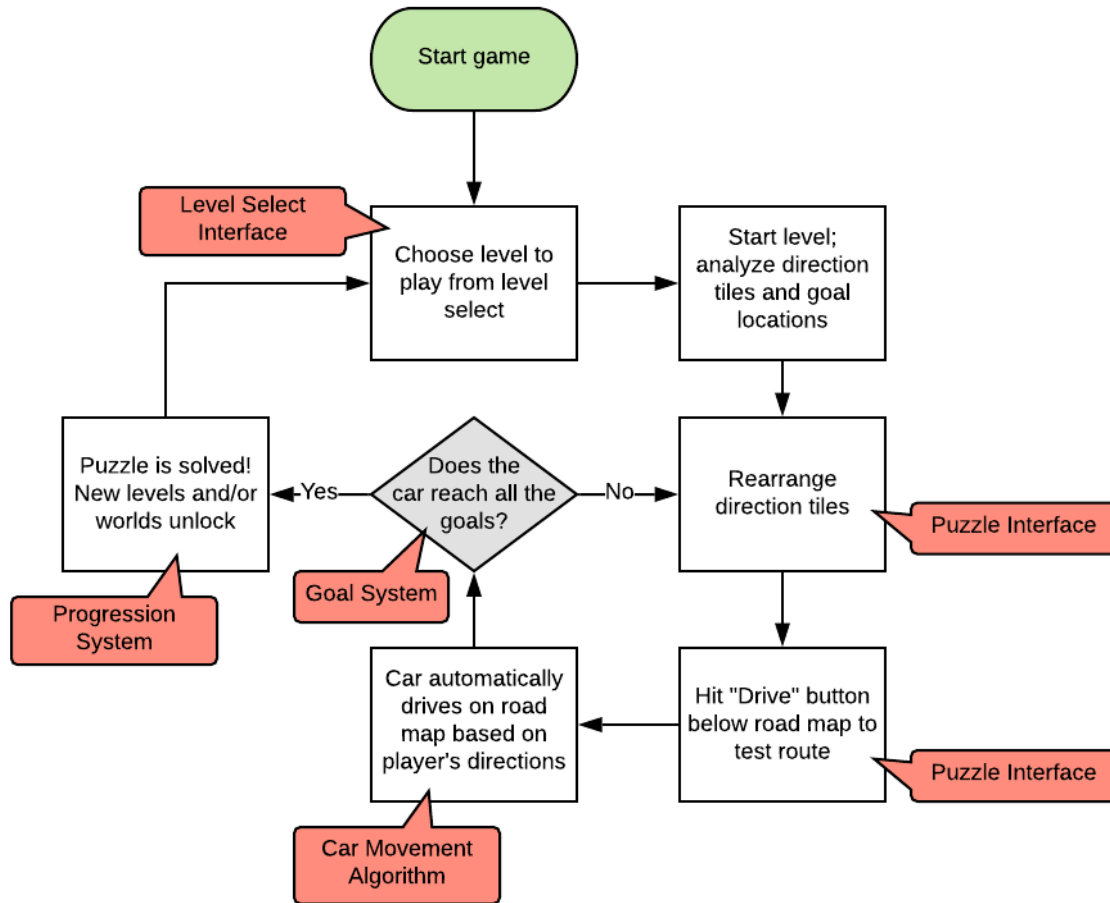
Sound Design

The sound effects in the game are meant to be similar to car sounds. For instance, clicking the Drive button to start or cancel a route plays a sound similar to a car engine starting and stopping. The background music is soft (although the volume can be adjusted via the settings menu) and filtered to sound like it's coming from a car radio. It's important that the game's music shouldn't be too obtrusive, or else it could disrupt the player's thinking.
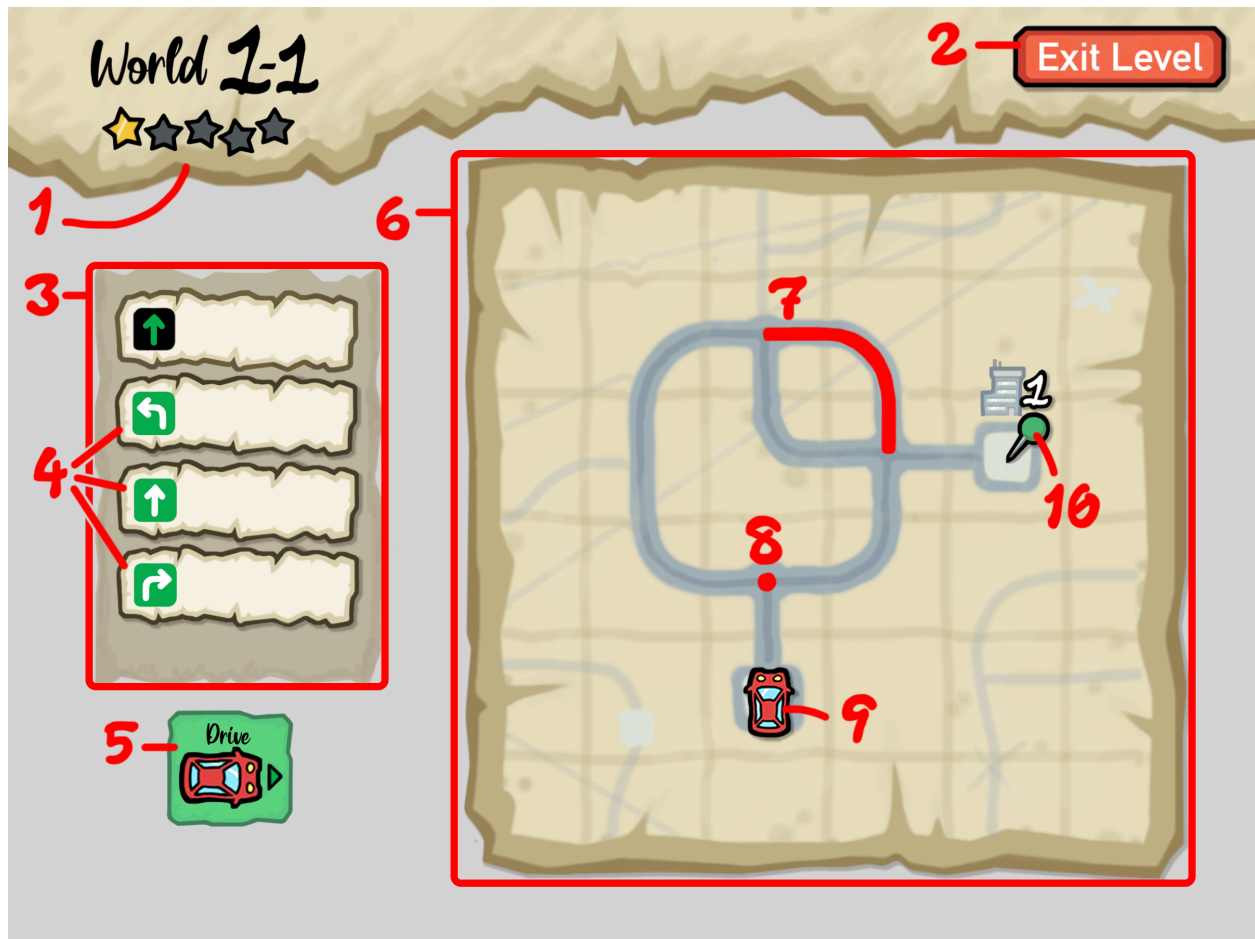
Untitled Car Game

Systems and Mechanics Specifications

Game Loop Overview and Essential Systems

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                            ┌─────────────┐
                            │  Start game │
                            └──────┬──────┘
                                   │
                                   ▼
  ┌──────────────┐         ┌──────────────┐         ┌──────────────┐
  │ Level Select │────────▶│ Choose level │────────▶│ Start level; │
  │  Interface   │         │ to play from │         │ analyze      │
  └──────────────┘         │ level select │         │ direction    │
                           └──────────────┘         │ tiles and    │
                                                     │ goal         │
                                                     │ locations    │
                                                     └──────┬───────┘
                                                            │
                                                            ▼
  ┌──────────────┐      ◇ Does the ◇        ┌──────────────┐
  │ Puzzle is    │◀─Yes─◇  car reach ◇──No──▶│ Rearrange    │
  │ solved!      │      ◇ all the   ◇        │ direction    │
  │ New levels   │      ◇  goals?   ◇        │ tiles        │◀── Puzzle Interface
  │ and/or       │         ▲                 └──────┬───────┘
  │ worlds unlock│      Goal System                 │
  └──────────────┘                                  ▼
  Progression           ┌──────────────┐    ┌──────────────┐
  System                │ Car          │    │ Hit "Drive"  │
                        │ automatically│◀───│ button below │
                        │ drives on    │    │ road map to  │◀── Puzzle Interface
                        │ road map     │    │ test route   │
                        │ based on     │    └──────────────┘
                        │ player's     │
                        │ directions   │
                        └──────────────┘
                        Car Movement
                        Algorithm
```

Puzzle Interface and Objects

- (1) Header: Shows which puzzle the player is currently in.
- (2) Quit Button: A button that lets the player leave the level.
- (3) Direction Board: Where the direction pieces live.
- (4) Direction Piece: The player's main method of interacting with the puzzle. Each one represents a direction that the car can follow. They can be moved up and down by clicking and dragging them.
- (5) Drive Button: The player can click this button at any time to switch between the route editing and route simulation modes.
- (6) Road Map: The network of roads that the car can navigate. Each world has a unique road map, which is used for every puzzle within the world.
- (7) Road: The basic building block of each road map. The car follows these to travel around.
- (8) Intersection: Any point where three or four roads meet. These are usually where the car reads new directions from the list of direction pieces to tell where to go next. Some intersections have landmarks, which allows them to be goals.
- (9) Car: In route simulation mode, this object automatically moves around the road map, following the list of directions the player creates.

- (10) Goal Marker: Designates a landmark as one of the goals that the player must reach to solve the puzzle. The numbers above goal markers indicate the order the player has to visit them.

Controls

The player is able to directly interact with these puzzle components:

- Direction Pieces: Except for the "Begin Route" piece, which appears at the beginning of every route, the player can click and drag any direction piece to move it. As they do this, the direction piece they clicked on will follow their mouse. Once they let go, the piece snaps back to the X position of the direction board, and all the direction pieces re-sort themselves by Y position. For instance, if the player drags the topmost direction piece (after Begin Route) to the bottom of the board, every other piece moves one space up and the selected piece takes the slot below them.

 Clicking on a direction piece without dragging it will bring up a short description explaining what the car does when given the direction.

- Drive Button: A button below the direction board. When the player presses it for the first time, the positions of the direction pieces freeze and the car starts driving around the road map, following the directions in the order the player placed them.

 During a route simulation, the Drive Button changes to say Cancel instead of Drive. Pressing it again will cancel the route, reset everything on the road map, and let the player go back to editing the route.

- Exit Button: A button on the upper-right of the screen that allows players to leave puzzles. When clicked, the player is sent back to the level select screen.

Direction Pieces

 The direction pieces are the player's most important tool in manipulating and solving puzzles. Every puzzle presents the player with a specific set of direction pieces to work with. The player has no way to add, remove, or modify direction pieces; they can only change the order in which they're arranged on the direction board.

 There are seven types of direction piece in the game:

- **Begin Route**: This is a special direction that appears at the top of every route and can't be moved. It doesn't actually do anything except communicate to the player that the car will begin the route by going straight forward from its starting point.
- **Go Straight**: The car continues straight through the next intersection it reaches. If the intersection only leads left or right, the car gets stuck and the route fails.
- **Left Turn**: The car turns left (relative to its current direction) at the next intersection. If the next intersection doesn't have a left turn, the car keeps going straight until it finds one.

- **Right Turn**: The car turns right (relative to its current direction) at the next intersection. If the next intersection doesn't have a right turn, the car keeps going straight until it finds one.
- **Go to End of Road**: Introduced in World 2. The car will travel forward to the end of its current road. It continues straight through every intersection until it reaches one where it can't go straight anymore. If this direction is used at a point where the car is already at the end of a road, it simply has no effect. If this direction is used while the car is on a road that loops in on itself, the car keeps driving around the loop forever, and if it is unable to reach its destinations, the player must cancel the route.
- **Repeat Previous Action**: Introduced in World 4. The car repeats the direction that was given in the previous direction piece. If this is the first direction in the list, it interprets the preceding Begin Route direction piece as Go Straight.
- **U-Turn**: Introduced in World 6. At the next intersection, the car turns 180 degrees, going back on the road it came from. In the rare case that this direction is used immediately after the player comes out of a one-way road, it cannot turn around and the route fails.

Road Map

- **Intersections:** Points with three or four direction pieces branching off of them. When the car reaches one of these, it reads a direction piece to determine where to go next.
- **Turns:** The car automatically turns left or right to follow these curved roads. This does NOT require a Turn Left or Turn Right direction.
- **Bridges:** Introduced in World 3. A bridge is basically two straight roads which cross over each other without counting as an intersection.
- **One-Way Roads:** Introduced in World 5. road segment that the car can only travel through in one direction. The exit side of the one-way road connects to the empty side of what otherwise functions as a three-way intersection.

Car Movement

Every time the player starts a route simulation, the car reads the direction pieces, in order from top to bottom, and drives around the road map based on those directions. At any time during the route simulation, the player can press the Drive Button again (which changes to say "Cancel" instead of "Drive") to cancel the route. This resets the car's position and all collected goals, and allows the player to rearrange direction pieces again.

The car automatically moves straight and turns to follow curved roads, regardless of the player's direction pieces. When it reaches an intersection, it briefly stops, then does whatever the next direction in the list tells it to.

The route can fail before all the directions are followed, if the car ends up in a situation where it can't do what a direction tells it to (for instance, it's supposed to go straight but the intersection only leads left and right). If this happens, the car gets stuck and stops. Also, in certain situations, when the the car can't fulfill the conditions of certain directions, it can get caught driving in an infinite loop, unable to reach its goals. In either case, the player is forced to cancel the route.

Once the car has followed every direction on the board, it can continue travelling until it reaches another intersection. After that, it doesn't know where to go, and again, the route ends.

While the game is in drive mode, a pointer on the direction board indicates where the car is in the route. Every time the car follows a direction, a check mark is added next to that direction and the pointer moves down to the next one.

Untitled Car Game- Car Movement Algorithm
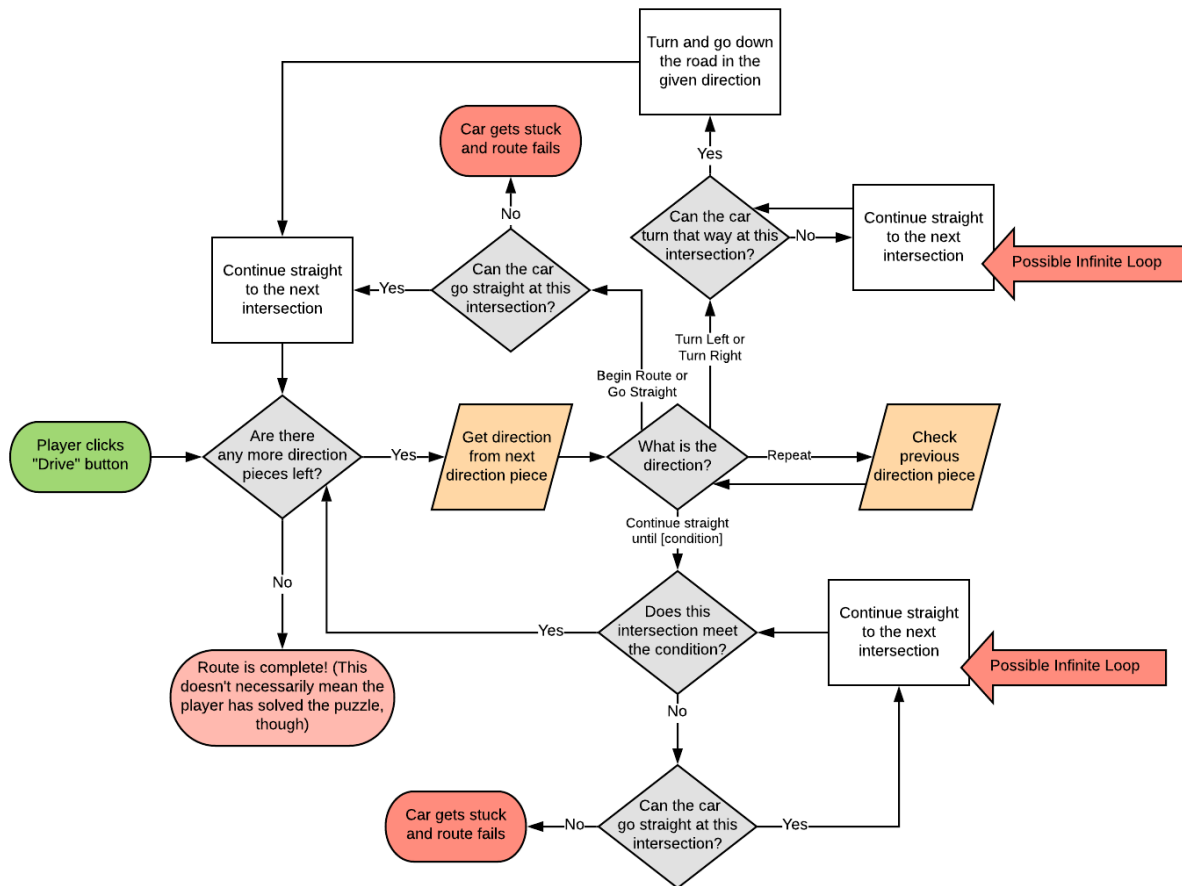
Goals
Every level has between one and four numbered goal points positioned on landmarks on the road map. The objective of every puzzle is to guide the car to all the goal points in order.

Whenever the car goes to an intersection with a goal, the goal is collected and removed from the map, *if* all lower-numbered goals have been collected already. Visiting a goal out of order doesn't cause the route to fail; the goal just becomes transparent as the car drives over it and doesn't get collected.

The moment that the last goal in any puzzle is collected, at any point during the route, the player has solved the puzzle and immediately wins. Winning a puzzle locks all the buttons and controls in the puzzle interface, so the player can't do anything else after the puzzle is

already over, then displays some congratulatory text and a button leading back to the level select screen.

Level Select Interface
Untitled Car Game's levels are arranged in two tiers: the whole game has a number of worlds, and each world contains a number of puzzles. Each world has its own road map with a unique road layout, landmarks, and visual aesthetic, and that map is used for all the puzzles within the world. The two factors that change between puzzles are where the goals are on the road map, and what direction pieces the player has to work with.

The level select system starts with a world select menu, which contains one button for each of the seven worlds in the game. World buttons the player has not unlocked yet are grayed out and, when hovered over, tell the player how many total puzzles they must complete before they can access the world. Clicking on an unlocked button opens a submenu with more buttons, one connecting to each puzzle within the world. Clicking on any puzzles that the player has unlocked brings the player into the puzzle.

Unlocking Levels and Worlds
In each world, the individual puzzles are arranged in a branching pattern, similar to the example shown here. Each individual level keeps track of which other levels it can be unlocked by. For example, when the player completes 2-1, the button for 2-2 notices and unlocks itself, and after 2-2 is solved, 2-3 and 2-4 do the same. This network is visible in the level select menu, so the player knows which puzzles will unlock more levels.

Entire worlds unlock in a much simpler way. The first level of each world is unlocked not by a specific level, but after the player has solved a total number of levels in the whole game. So, in this example, although World 1 only has one puzzle, once the player solves that puzzle they can move on to World 2. From there, they need to solve four more puzzles in World 2 to unlock World 3.