In consultation with the course staff, each team submits a checklist of deliverables for their project. This is a comprehensive list of what you're planning to demonstrate at final project checkoff. Usually the list includes each of the major modules in the design with a sentence or two describing their functionality and how it will be demonstrated. The checklist should have three sections:

the commitment: the minimum that you hope to achieve; shows an adequate understanding of digital systems and Verilog. Complexity typically twice the complexity of the car alarm lab. Project grades are typical 10-19 out of a max of 35.

**the goal:** a fully functioning project meeting all the checklist items in this section. Demonstrates a superior understanding to digital systems and implementing complex systems - perhaps with multiple time domains, interface to external devices, flash memory, audio, etc. The implementation goes beyond what was in the labs. The project grades range from 20-29.

**stretch goal:** a top notch project that really stands outs with complexity, innovation and risk. In addition to the checklist, you will provide a status update near the end of November explaining the operational status of the blocks that you proposed to design and expected completion timeline, problems and solutions that you envision.

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|            | T1   | D. de la  | A :             |  |
|------------|--|---|-----------------|--|
|            | Task   | Details   | Assigned        |  |
| Commitment | Detect steering wheel bar                        | Isolate the shape of the green bar from video input, and apply skeletonization to turn the shape into a line.           | Jing            |  |
|            | Determine endpoints                              | Display the endpoints of the skeletonized bar   | Jing and Venita |  |
|            | Divider module                                   | From the two endpoints of the skeletonized line, calculate the slope by building a divider module                       | Jing and Venita |  |
|            | Calculate angle from slope                       | Create an arctan table to convert slope to approximate angle  | Jing and Venita |  |
|            | Detect acceleration                              | Turn on an LED on the labkit when car is accerating   | Venita          |  |
|            | Detect brake                                     | Turn on an LED on the labkit when car is braking  | Venita          |  |
|            | Functioning game states                          | Game will enter different states depending on the actions of the driver (accelerating, decelerating and constant speed) | Venita          |  |
|            | Show the road                                    | Generate a road that changes based on a pre-mapped input  | Janie           |  |
|            | Produce sound effects                            | Output different sound effects depending on the state of the car  | Janie           |  |
| Goal       | Environment changes relative to speed            | Show the markers moving at a faster rate after driver hits acceleration   | all             |  |
|            | Display deceleration                             | Show the markers moving at a slower rate after driver hits brake  | all             |  |
|            | Display constant speed                           | Show the speed of markers not changing  | all             |  |
|            | Output audio effects                             | For braking, accelerating and crashing  | all             |  |
|            | Display turning                                  | Image of road changes after driver turns left or right  | all             |  |
| Stretch    | Display dashboard                                | Display dashboard at bottom of screen with indicators for acceleration, brake, etc                                      | all             |  |
|            | Display steering wheel on screen                 | Display a steering wheel on the screen that turns as the player's physical wheel turns                                  | all             |  |
|            | Add obstacles to road                            | Display obstacles on the road that the driver has to navigate around  | all             |  |
|            | Allow player to change vehicle (car, horse, etc) | Change the vehicle displayed on the screen  | all             |  |
|            | Add trees to display to indicate movement        | Show trees growing in size as they get closer to the driver as they drive along the road                                | all             |  |
|            | Smoother road turns                              | Display a smoother transition when the car is turning   | all             |  |