

0. State your names. Only one of your needs to submit this.

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1. Present the problem statement. For example, an average homeowner designing a new house wants to play with options for installing solar panels.

An average homeowner is building a new house and wants to play with options for the house layout and design. This includes the layout of wall placement, furniture, rooms, doors, windows, and stairs.

2. Explain who the intended user is. It can be you or a fictitious entity you will represent. For example, the user is a homeowner building a new house.

The intended user is a prospective homeowner who is not comfortable with more advanced 3D modeling design tools.

3. Describe why the user has this problem. For example, there are decisions to make and many options, which are difficult to manage for the average user.

The homeowner is having a hard time trying to visualize how much space is needed for each section of the home. The homeowner is deciding where to put each room and there are too many options. It is hard for the homeowner to draw a sketch with paper and pen because they lose track of the scale.

4. Describe how a solution would benefit the user. For example, maximizing the solar generation while minimizing the cost saves the homeowner money. Stay within the scope of the problem; e.g., do not consider climate change because the connection is too indirect.

The homeowner will be able to come up with a plan that they love with ease. The homeowner could communicate to others more clearly about the layout that they want. Creating the basic design of their home will save the homeowner time in creating an intricate design. The prospective homeowner is saved money by minimizing wasted space and maximizing use purchased materials and furniture purchased.

5. Describe the general flow for addressing the problem. The existing (or imagined) flow does not have to involve a computation solution. For example, the user defines the property and house layout and expected energy needs, then the system proposes solutions that best satisfy the criteria. This used to be done on paper by expensive expert contractors.

The homeowner first decides on the dimensions of the home. They then pick elements from the “Standard Items” bank or creates elements that are of a custom size to put into the house, which are scaled to the house appropriately. The homeowner then modifies the plan to ensure that the house comfortably fits all the elements that the homeowner wants.

6. What is the general nature of the solution? For example, app, standalone program, website, plug-in.

App or standalone program.

7. List the general software components you envision playing a role. For example, web server, database, game engine.

Game engine or front end designer for a desktop application.

8. List the general hardware components you envision playing a role. For example, drone, VR headset, tablet. You are responsible for your own hardware, so be reasonable.

Desktop computer.

9. Describe similar solutions, if any, and justify (or make up a justification) for why they are inadequate. For example, SolarBlaster 9000 does something similar, but its cost and complexity are prohibitive. Do not get detailed with software engineering aspects. Requirements and specifications, for example, come later in the process, unless they are directly relevant to the proposal and have a justification. For example, an Android app because you have an Android device and want to become an app developer.

Google Sketch-Up and many similar 3D modeling tools have a steep learning curve and is intended for use by professional-level designers and architects. Additionally, while other modeling tools are very thorough, they may provide too much information for a user that wishes to “play” with the design of building mapping but does not want to create a technical blueprint document. 3D modeling software can also be taxing on an average computer that doesn’t have much CPU.

WORKBENCH	Layout1	Layout2	STANDARD ITEMS	
<div>House 64' x 58'</div> <div><div><div>Couch 60" x 2'</div><div>Bedroom 1 10' x 9'</div><div>Master Suite 20' x 30'<div>King Bed 76" x 80"</div></div></div></div> <div>Create PDF +</div>			Kitchen Sink <div>2'6"1'</div>	<div></div>
			Bathtub <div>5'2'6"</div>	<div></div>
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