

Furniture Layout Explorer

This assignment is meant to allow you to showcase your front and back-end skills. You may use any language or platform that you feel comfortable with to fulfill the assignment. Additionally, keep track of your time, and the decisions you make along the way when completing the challenge. We estimate that you will be able to complete a basic version of the challenge within 6-8 hours. If you are feeling inspired and want to spend more time, you are welcome to do so, but it is not required or expected.

Deliverable:

The final deliverable should be a .zip (less than 500MB) file that contains:

- **Front End project code:** with any supporting assets and README file explaining how we can run it.
- **Front End Video:** demonstrating the assignment is working. If needed, you can compress the video with open source software like Handbrake (<https://handbrake.fr/>)
- **Back End PDF:** architecture and how it would interface with the front-end.
- **PDF Summary:** Brief description of your efforts, any assumptions and/or interpretations, and the approximate time it took to achieve those results.

Your challenge

Front End

Design a system that allows furniture to be added to a room on demand. The system should allow the placement of new furniture and visualize their physical arrangement in the room.

1. Front-end Functionalities:

- a. Ability to add and remove furniture from a specified list of available furniture (i.e., chair, sofa, table, lamp, tv, fan). Additionally, each of them should have its own properties like size and states (i.e., lamp on/off, fan on/off, recliner reclined or not, etc.)
- b. Animate furniture as they are added to the view (starting in random positions inside the room)
- c. If furniture is added and is colliding with another object, move them and animate them so no objects are in contact with each other
- d. Add the ability to re-arrange furniture around the room
- e. Some items may have multiple states (lamp on/off, chair reclined/upright, fan on/off, etc.), make it somehow visible which state they are on

2. Front-end considerations

- a. Feel free to deviate from any of the previous functionality requirements if you feel it is an improvement for the end-user experience. Please indicate in the PDF summary.
- b. Feel free to hard-code or use dummy data that you would assume is provided by the back end, since there is no back end. Please indicate in the code.
- c. As this works like a prototype, feel free to use any design assets, coding libraries, or frameworks available to you and scope this assignment up or down where necessary

Back End

Provide a system architecture design for the back end that would allow us to support the front-end functionalities.

1. Back-end requirements:

- a. Back-end system architecture design
- b. Interface with the front end
- c. Identify and justify the technologies, libraries, services, db, etc. that the system would use
- d. Furniture can be updated by the organization manager at any time

2. Back-end considerations:

- a. Scalability: as if this would be deployed to an Ikea scale world-wide
- b. No back-end code is required, and it will not be taken into consideration, only system architecture and explanation of your choices and tradeoffs

Please note, the instructions above are open to interpretation. It is up to you to interpret and resolve any functionality issues that come up, i.e. UI/UX or animations, or add any additional screens if needed for a satisfactory UX. Please explicitly mention your intent and assumptions.

If some aspect of the task is challenging you beyond your capability, that is ok. Modify the design or functionality to help illustrate what you are comfortable doing. Make a note when you decide to do this. Similarly, you may expand the challenge if you feel inspired to explore.