Assessment B

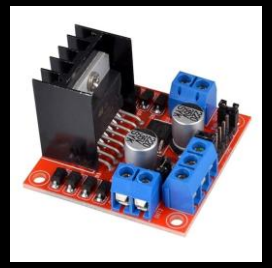
By Take Five

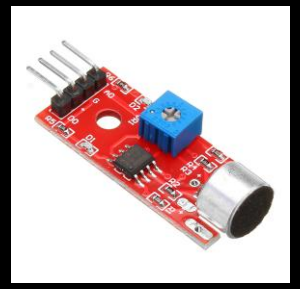
A list of the main resources such as hardware and software elements that are expected to be used

by Seehem

Main Hardwares:

H-Bridge DC Motor Driver





Arduino Sound Sensor

Arduino Uno R3

ESP-32S (Bluetooth and Wi-Fi Module)

I2C 16x2 Arduino LCD Display Module

7.4v Li-ION Battery Rechargeable

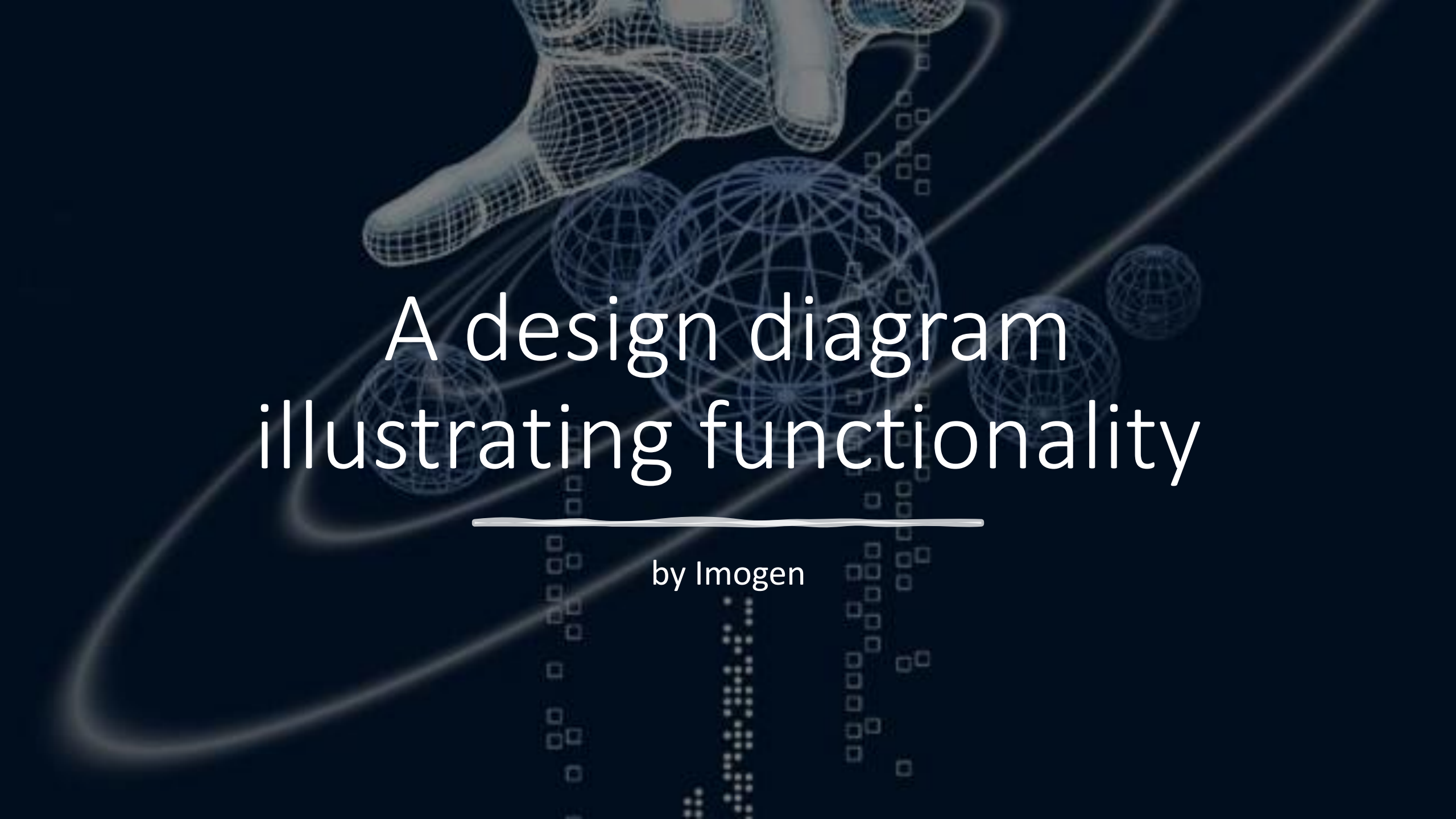
Arduino Camera Module 300KP VGA 640x480 OV7670

DC 200RPM 3-6v BO Gear Motor With Plastic Tire Wheel x4

Infrared Sensor (IR/PIR Motion Sensor)

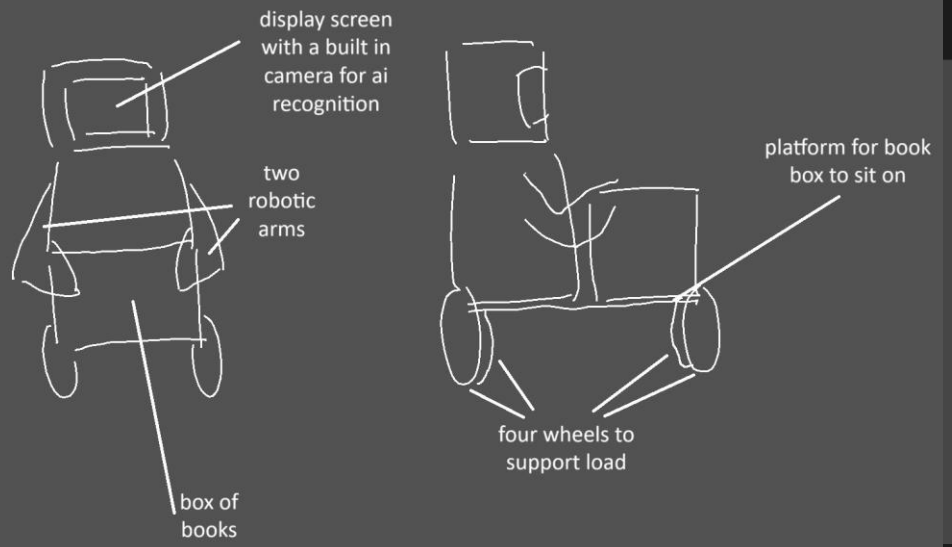
Softwares:


www
HTML5
CSS3
js
Cloud
XML
PHP
flat
iBROAD DIGITAL
header
.com
.org
.net
footer
database



A design diagram illustrating functionality

by Imogen



BookBot

Connect | Import map | Statistics | User guide

To connect to BookBot:

- Lorem Ipsum is simply dummy text of the printing and typesetting industry.
- Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book.
- It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged.
- It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

Model Code

Model Pin

CONNECT

BookBot

Connect | Import map | Statistics | User guide

It is a long established fact that a reader will be distracted by the readable content of a page when looking at its layout. The point of using Lorem Ipsum is that it has a more-or-less normal distribution of letters, as opposed to using 'Content here, content here', making it look like readable English.

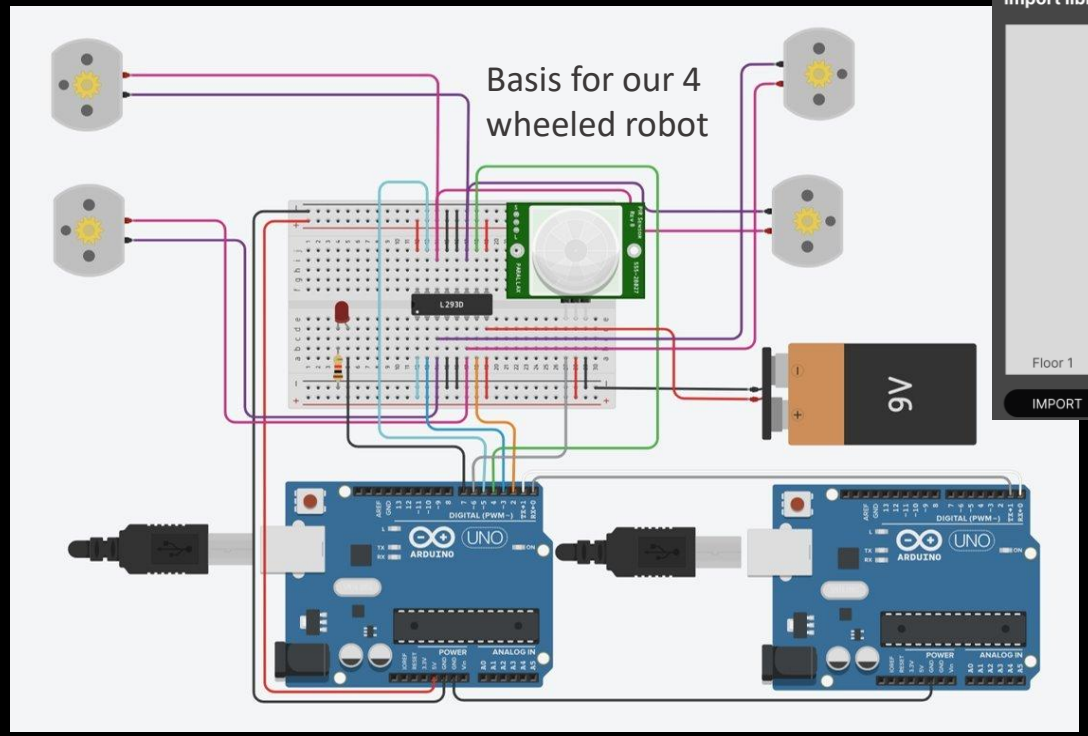
Many desktop publishing packages and web page editors now use Lorem Ipsum as their default model text, and a search for 'lorem ipsum' will uncover many web sites still in their infancy.

Various versions have evolved over the years, sometimes by accident, sometimes on purpose (injected humour and the like).

Contrary to popular belief, Lorem Ipsum is not simply random text. It has roots in a piece of classical Latin literature from 45 BC, making it over 2000 years old.

Richard McClintock, a Latin professor at Hampden-Sydney College in Virginia, looked up one of the more obscure Latin words, consectetur, from a Lorem Ipsum passage, and going through the cites of the word in classical literature, discovered the undoubtable source.

Lorem Ipsum comes from sections 1.10.32 and 1.10.33 of "de Finibus Bonorum et Malorum" (The Extremes of Good and Evil) by Cicero, written in 45 BC.



BookBot

Connect | Import map | Statistics | User guide

Import library map

Floor 1 | Floor 2 | Floor 3

IMPORT

BookBot

Connect | Import map | Statistics | User guide

Today's completed jobs

Floor 1

Books received: 111
Books returned: 111
Students guided: 0

Floor 2

Books received: 52
Books returned: 52
Students guided: 2

Floor 3

Books received: 5
Books returned: 5
Students guided: 1

Noise levels

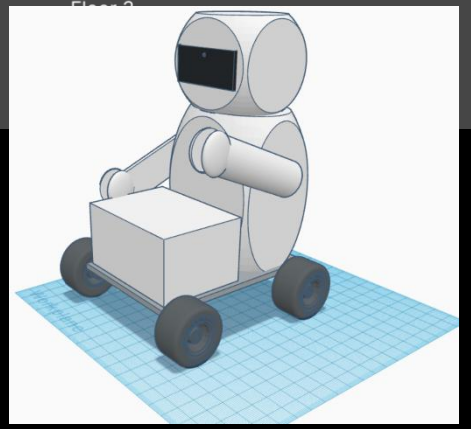
Floor 1

Quiet zone: regular noise level
Silent zone: went above expected noise range 3 times today

Floor 2

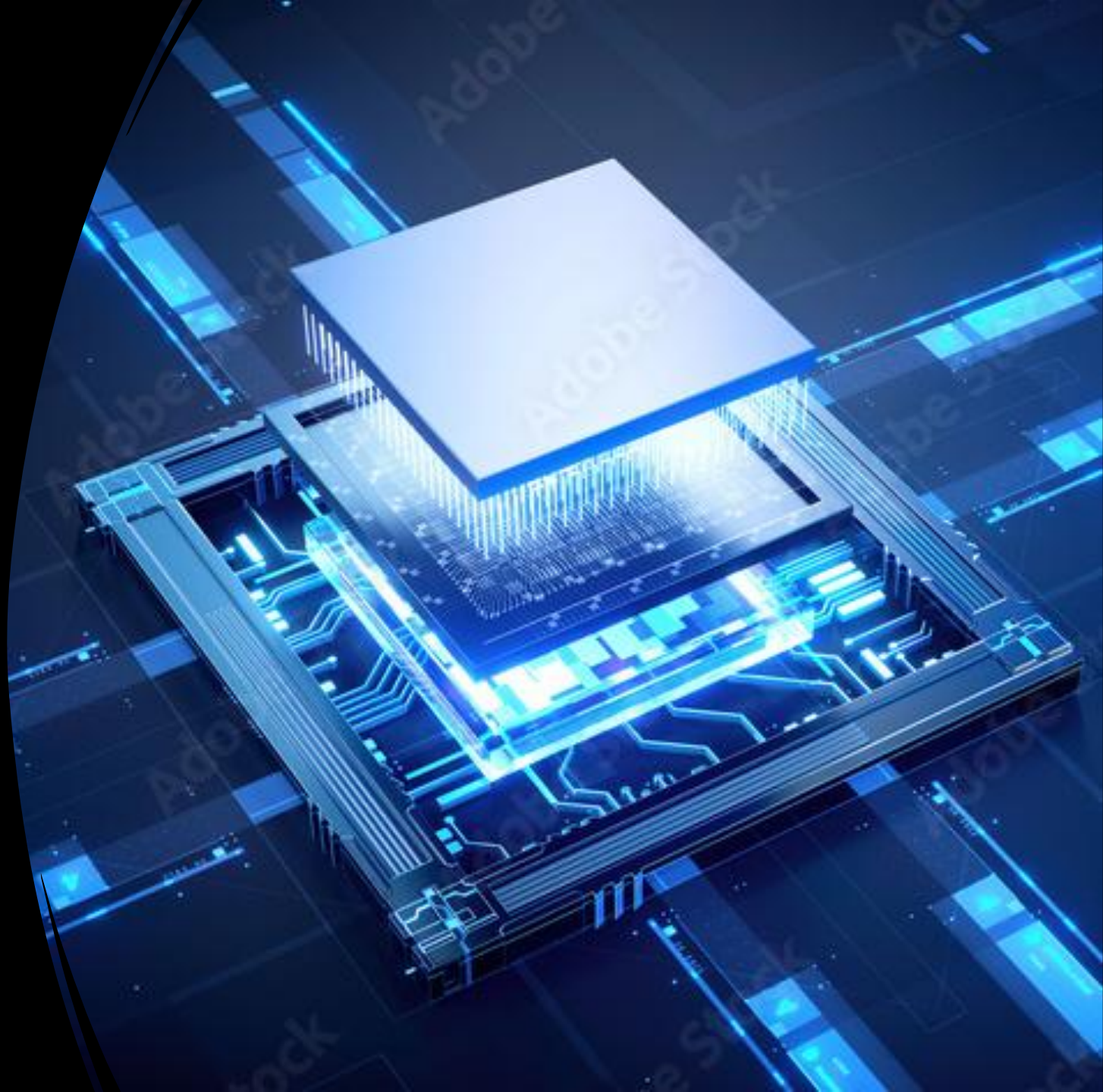
Quiet zone: regular noise
Silent zone: regular noise

A draft of what we want the website to include
(includes text boxes full of dummy text / Lorem Ipsum text)



An outline of test plan which lists the main types of inputs and expected outputs

by Valeria



Test No.	Test Data	Purpose	Expected Result	Actual Result
1	Scan the book with a RFID scanner	To test whether the robot can place the book to its destination shelf.	The robot screen should display the book title and location of its shelf.	
2	Ask the robot to place the book on its designated shelf trolley.	To test whether a robot can navigate its way to the designated shelf and place the book there.	The robot should be able to get to its destination (each shelved trolley) within the library using the map.	
3	Detect the noise level	To test if the robot can detect noise level to see if it's above the expected and give a warning to those who are disrupting.	The robot should measure sound level and give a warning through the speaker if the certain level of noise exceeds the expected sound level.	
4	Get speaker to say something	To test the speaker functionality.	The robot's built in speaker would give alerts to students to quiet down.	
5	Get BookBot to go to a shelved trolley	To check if the AI recognised system can identify the book's designated shelf.	The robot should use camera and AI systems to detect the book and its shelf area and place it on the shelf.	
6	Ask BookBot to guide the student to requested destination within the library	Testing whether the robot can guide the student to their destination within the library.	The robot accurately navigates the library floor, identifies the student's requested destination, and guide them to it.	
7	Import map to website	To make sure the map has been imported in website so the robot can use to navigate itself.	The map should be successfully imported into the website, allowing the robot to access and navigate the library environment effectively.	

An up-to-date risk register

By Jasmine and Disha

Risk	Description	Individuals affected	Impact	Probability	Severity	Measures to prevent	Further plan
Privacy Concern	It is crucial to maintain and follow the safeguarding rules and respect the privacy of other individuals in the library. Due to the robot having a camera attached to it (required for navigating), it is most likely to unintentionally capture the faces of the students, which would violate their privacy and cause miscommunication.	1) Students in the library, while they are borrowing books, studying etc. 2) The library staff. 3) Any library visitors, for example during open days.	It can have a huge impact because individuals, particularly students and staff members may not feel comfortable with their faces being captured in the camera, thus it will violate their privacy.	Most likely	9/10	- If any complaints arise, we should try to explain to the individuals, the purpose of this robot and highlight the benefits of using this robot and how it assists the library staff and explain to them that all this footage is not going to be saved.	- Ask users for some feedback, regarding any issues. -Clearly communicate to users how their data is handled, stored and used, fostering trust and reducing privacy concerns.
Misuse & Security Concern	There is a risk for the robot being vandalised or stolen, this includes any physical damage to the components of the robot. Moreover, vandalisation of the robot could also lead to the robot being misused in different ways.	1) Library Staff 2) Students	If the robot is misplaced from the library, it will no longer be able to serve its function. If vandalised and misused, the more it will not be able to serve its function as it is expected to.	Possible	8/10	- Add a GPS Arduino microcontroller, which would help to check where the robot currently is and additionally, it could make a sound whenever it is grabbed/ placed outside the library, as it would help to notify the user that the robot has been misplaced, through a message being sent to the user's mobile phone.	- Using a website application, we can ensure the safety of the robot, by adding a feature which asks for a password/ pin code on the website, so that only specified users are able to access the robot and connect to it. This will ensure that the robot doesn't go out of the library.
Running into obstacles	It is possible that the robot unintentionally runs into students, while it is moving around the library.	1) Students 2) Staff	The robot could easily run into obstacles and individuals, which could also cause damage to its physical components. In addition, if the robot accidentally hits a student, who isn't aware of its purpose and functionality, they might be quite shocked or unhappy about this, and for example, in a worst-case scenario, the individual might accidentally kick the robot (due to shock/ instant reaction).	Likely	7/10	- A sensor, such as the Passive Infrared Sensor can be utilised, which will assist to ensure that the robot doesn't run into any potential obstacles.	-The robot could be only programmed to specifically navigate on the designated map of the library.

Lack of resources	If the resources aren't all available or if the budget is over because of unexpected costs in development, hardware, or software.	1) Team members	The robot may not implement all the functionalities we originally wanted it to, affecting its performance and impact. Hence, it may exceed the original balance, therefore affecting our financial concerns for this project.	Likely	7/10	-Research what components are needed in advance.	- Order a few weeks ahead, and order more than one, in case they are faulty.
Not all team members attending the meeting	One or more team members not attending the group meetings for this project, both in the timetabled lessons and meetings outside of the sessions.	1) Team members	It can lead to miscommunication upon the current ideas and tasks, which might also lead to uncomplete work, so tasks might take longer than required to be completed, therefore affecting the team's performance.	Possible	5/10	-If a situation where a team member cannot attend the meeting, it is essential for them to reply to emails and let the members of the team be aware in advance. -Using collaboration tool such as Notion and Teams, to communicate with each other and check each other's work, alongside communicating with each other. -We can order more just in case it is faulty.	-The team leader should set deadlines each week, which would assist to keep a track of everyone's progress, by for example asking them to submit all of the work they have done so far in this week (even if it's yet incomplete) and ensure that none of the members are running behind the current week's schedule. -We can test them ahead of the implementation of the robot in the library.
Damaged Hardware	Hardware component not working.	1) Students 2) Library staff 3) Visitors	If the hardware is not working properly then this would affect the robot's performance, which affects its purpose for which it was designated for. Inaccuracies in sensors could affect the robot's ability to navigate and interact with the environment.	Possible	7/10	-We can order more just in case it is faulty.	-We can test if the components work regularly to avoid any malfunctioning. -We can test them ahead of the implementation of the robot in the library.
User interface challenge	Difficulties in understanding or interacting with the robot's interface and website application.	1) Library staff	This could impact user satisfaction as users are not comfortable with using the robot and the website because they may find it complicated to use, which means that in the future they may resist to use our robot, which affects its adoption.	Possible	7/10	-Make the user interface user-friendly so that it is easy and simple to navigate through.	If there are suggestions that the robot and website is not widely used because of this problem, then we will work on making the robot and website simpler to use.

Lost code/ Misplaced components	This risk involves the unintended loss or misplacement of crucial code segments crucial to the robot's operation.	1)Students 2)Library staff	Lost code may result in data integrity issues, leading to inaccuracies in book tracking, user records, compromising its reliability.	Possible	7/10	-We can restrict access to sensitive areas to authorised users only. This will help prevent unauthorised handling or modifications that could lead to lost code. -We can assign clear ownership of specific codes or hardware components to team members. This will promote responsible handling and will reduce the chances of code being misplaced.	-Conduct a thorough risk assessment early in the project to identify potential areas of vulnerability related to code and component management. -We can prioritise the risks based on their likelihood and impact, giving more attention to those associated with the code and the components.
Environmental Changes	This refers to the potential impact of external factors like changes in the library settings.	1)Students 2)Library staff.	-Changes in the library environment may affect the robot's performance, posing challenges for its sensors and mobility. -Poor adaptability to varying lighting conditions may affect the robot's perception, potentially leading to navigation errors.	Possible	7/10	-Regularly update the robot's environmental mapping data for any structural changes within the library. This helps in maintaining accurate navigation information for the robot. -Include a user-friendly manual control option for library staff to intervene and guide the robot in case of navigational uncertainties caused by lighting changes or environmental changes.	-Integrate sensors that can detect ambient lighting conditions and adjust the robot's internal lighting or visual perception settings accordingly. This will ensure optimal performance in different lighting environments. -Stay informed with the library's facility management team to stay informed about any planned changes or renovations within the library.
Energy Consumption	Potential challenges associated with the robot's power requirements and usage. These are factors such as inefficient energy, insufficient power supply or the environmental impact of the robot's energy consumption.	1)Students 2)Library staff	High energy consumption by the robot could lead to increased operational costs and environmental concerns if sustainable powers sources or energy-efficient designs are not prioritised.	Possible	4/10	-We can select energy-efficient components and hardware for the robot to minimise power consumption while maintaining optimal performance. -Develop and optimise software algorithms to reduce computational load and lower energy consumption during the robot's operation.	-Involve users in sustainability initiatives by showcasing the robot's energy-efficient features and promoting eco-friendly practices within the library. This would also be helpful as users will be given an insight to how to use the robot

Project planning to include work allocation by each peer on a time-line

By Imogen

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innovation project planning

progress view | timeline view | calendar view | + | Filter | Sort | New

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