First ever!
Wooden,
Screen free,
Multi-Language,
STEAM Oriented,
Braille compatible,
Physically programmable,
Robot!

robol

Q & A for Aarohan

DOES YOUR PRODUCT HAVE A CLEAR TARGET MARKET OR AUDIENCE?
Yes definitely our many ideas is to make kids grasp the logic behind the programming/coding. So we would say our target audience are children. As our product allows children to perform programming within local languages like Kannada, Hindi etc including English. its widely acceptable in govt schools. And also our product is so designed that, even visually impaired children can learn programming.

DOES YOUR PRODUCT ADDRESS A CLEAR NEED, PROBLEM, OR OPPORTUNITY?
Yes, we address an opportunity to let the kids learn programming and explore all by themselves without using any additional gadgets like Tab, Laptop, Mobile, Desktop etc. This product can leverage the creativity of a child which helps one to come up with many new programs on their own and Our product is also eco-friendly, as of now we have used wood to build the body of the product.

DOES YOUR PRODUCT HAVE A POTENTIAL TO SCALE AND POSITIVELY IMPACT PEOPLE??
Absolutely Yes. as We all know the world is picking up with more automation, robotics, AI etc, both to stay and beat the competition its very much required to educate/train our children, who are our future and will be discovering the same platforms. Fortunately, few International private schools provide this kind of training for children at a younger age. However 77.9% of our existing schools are Govt and Govt aided Schools who learn in local languages.
Now this is where our product comes into the picture. This Product ROBOL can enable children, even situated in rural areas and with the regional languages can learn programming at a very young age. It triggers him/her to sneak into a whole new digital world waiting for him/her to discover.

DOES YOUR PRODUCT HAVE COMMERCIAL VIABILITY??
Yes. We can also come up with various foreign languages as well.

IS YOUR PRODUCT ECONOMICAL AND SUSTAINABLE?
Yes its economical, as we don't require additional gadgets to operate it and it's sustainable too.

DOES YOUR PRODUCT INCLUDE INNOVATIONS IN TECHNICAL DESIGN AND/OR IMPLEMENTATION?
By the mercy of the Supreme Lord inspiring within, we are able to come up with a unique design. Our product uses a new format with the existing technology to teach children programming especially for visually impaired through having various holes of 3 X 2 Matrix in the form of Command coins which is nothing but integrating Braille system in it, which is Unique and first of its kind.

Q & A for Aarohan

IS YOUR PRODUCT TECHNOLOGICALLY VIABLE?
We already have a working prototype with us so we would say 'Yes' it is technologically viable, Sir.

IS YOUR PRODUCT A FULLY FUNCTIONING PROTOTYPE, BEYOND A CONCEPT IDEA OR MOCK UP?
Yes, it is a fully functioning prototype and this was made possible by the great team we have.

IF THERE ARE SIMILAR PRODUCTS OR SERVICES IN THE MARKET, DOES YOUR PROJECT CLEARLY AND MEANINGFULLY INNOVATE BEYOND THOSE EXISTING PRODUCTS OR SERVICES?
Well, to be honest, No, Sir. There is no such product in the market similar to this one, which can help a regional language child, a visually impaired child to learn programming.

DOES YOUR PRODUCT PRESENT A NEW AND IMPROVED WAY OF SOLVING A PROBLEM?
We are giving a way to children, an opportunity, a window to peep in to the digital world. And preparing these kids for the future at the same time have fun while learning.

IS YOUR PRODUCT OR PROTOTYPE USER-FRIENDLY, SIMPLE AND INTUITIVE TO USE?
We are very happy to answer this question. Yes, its most simple yet most revolutionary, making a child 'future ready'.

DOES YOUR PROTOTYPE HAVE DURABILITY?
Yes, its durable. However there is a lot of room to enhance it, we may require expert guidance on the same.

DOES THE ENTRY PRESENT YOUR PRODUCT CONCISELY AND EFFICIENTLY?
As much we understand, we have tried it to present our product concisely with all the necessary documents attached.

**IS YOUR PRODUCT'S PURPOSE AND BASIC FUNCTIONALITY EASILY UNDERSTOOD?**
Yes , because our main Audience are the children, so we are presenting the product as simple as possible and easily understandable.

DOES YOUR PRODUCT EXPRESS A POSITIVE TONE?
Definitely yes, we are expressing through our product that, digital screens and laptops are not only the means to learn and prepare themselves for the future. But while playing toy like Bot can also teach them programming in an easier way. Which is highly appreciated and widely accepted under STEAM education model.

Report Contents:

- Product Description
- Statistics
- Using the product
- Product elements
- Product prototyping stages
- Product block diagram
- Mechanical designs
  - BOT and SLATE 2D designs
  - Coins design for different languages
- Hardware designs
  - Block Diagram
  - PCBs designed
- Software designs
  - Software architecture
  - Algorithms used
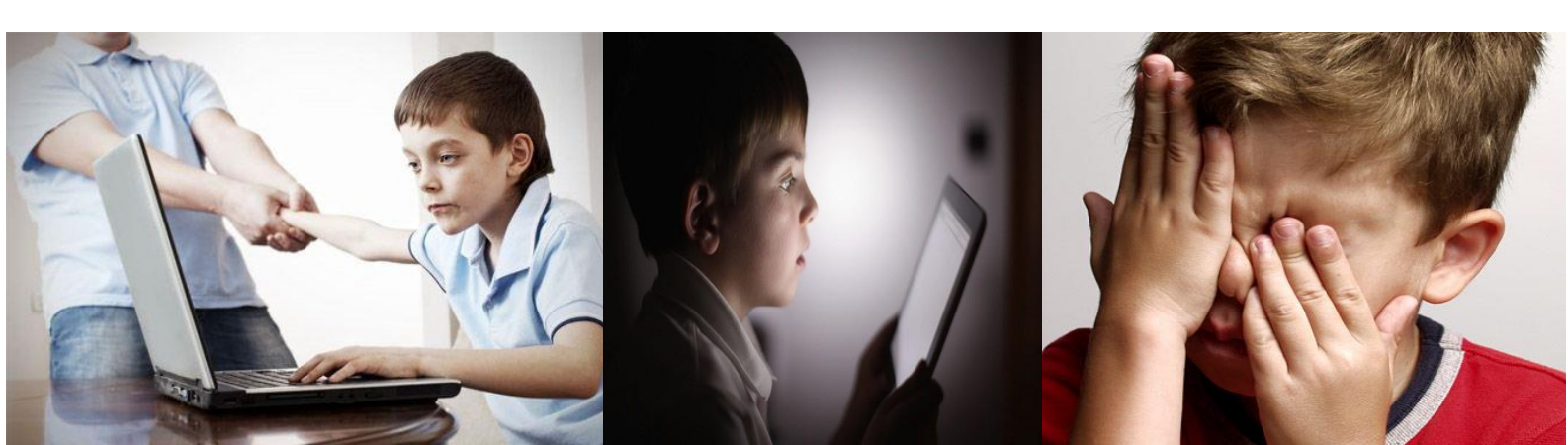
Product Description

Robol is a technology that helps children learn programming in a simple manner.

Today's children are immersed in technology from a very young age. This exposes them to some of the biggest vision-related risks; minimising this is our primary motivation in creating a "screen-free product." There is no radiation emitting display present in our product.

Our product comprises of 2 major parts - the bot and the slate.

The bot is given a set of commands by placing coins in the slate; each coin represents a specific keyword - this includes almost 40+ keywords directly taken from today's computer programming. Our Product is also capable of taking in input commands through different types of sensors such as touch, rain and obstacle detection, which are embedded in the bot.

We also cater to the needs of those who are visually impaired, by integrating the braille system into products.

It is also our mission to integrate all the local languages of our country. While we have a long way to go, we can proudly say that our product is already accessible in three different languages - English, Hindi and Kannada.

Product Elements

The **bot** is given a set of commands by placing coins in the slate. It is also capable of taking in input commands through different types of sensors such as touch, rain and obstacle detection, which are embedded in the bot.

The **slate** scans the coins when they are placed in their slots, and sends their commands to the bot.

Each **coin** represents a specific keyword - this includes almost 40+ keywords directly taken from today's computer programming.

Statistics

A majority of parents (52%) very often or occasionally try to cut down the amount of time they spend on devices.

SOURCE: COMMON SENSE MEDIA

CNN

There are 372.4 millions of children of age group 0 to 14 among which 273.6 million (73.46%) are from rural and 98.8 millions (26.53%) from urban areas.
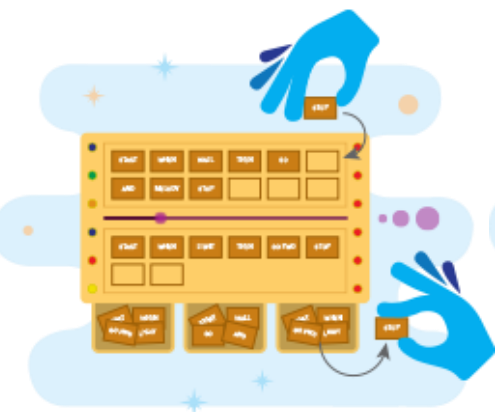
According to the ministry of statistics and programme implementation (MOSPI) govt of india 2011 census in india

40 computer related jobs were identified for Blind and Visually Impaired
persons. Of these, 38 were found viable (28 fully, 10 partially) for persons with total loss of sight.

- http://nivh.gov.in

Using the product

Steps For Play & Learn

INSERT COINS ON SLATE AND SLIDE THE SCANNER

SLATE WILL SEND COMMANDS TO RORA

OYA!! RORA RUN YOUR COMMANDS!!

Play Cards

Good Morning !!!!
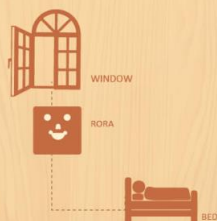
Program your Rora to wake you up in the morning.

PROGRAM

WHEN · LIGHT · FORWARD · FOR
10 · ROTATIONS · THEN · BUZZ
THEN · WAIT FOR · TOUCH · STOP

WINDOW
RORA
BED

Task: Place Rora near the window before sleeping. She will wake you up with an alarm tone as soon as sunlight falls on her

How: Measure distance, route and turns from the window to your bed. Rora has to sit near your window.

Run it's raining!!!

Program Rora to inform you when it starts raining.

PROGRAM

WHEN · RAIN · THEN · FORWARD · FOR
5 · ROTATIONS · THEN · LEFT · FOR
10 · ROTATIONS · AND · BUZZ · ●
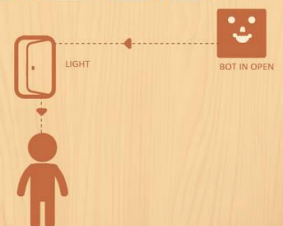WHEN · SOUND · THEN · STOP

It's raining
LIGHT
BOT IN OPEN

Task: Place Rora outside the door to check if it's raining. She will inform you as soon as she feels a splash of water on her head!

How: Measure the distance, route and turns for Rora to go from your balcony to you. Rora has to stand out.

Unique Doorbell

Rora will let you know if someone is knocking the door

PROGRAM

WHEN · SOUND · THEN · BUZZ · AND
REVERSE · FOR · 10 · ROTATIONS · THEN
BUZZ · BLINK EYES · AND · STOP

BUZZ
DOOR
BED

Task: PPlace Rora near the door facing your bed. As soon as someone knocks the door, she will buzz and inform you.

How: Place Rora near the door and measure the distance, route and turns from the door to your bed. Program your slate and let Rora do her job.

Birthday alarm

Program Rora to wish happy birthday to your dad

PROGRAM

WAIT-FOR · 8 · HOURS · THEN · FORWARD
FOR · 5 · ROTATIONS · THEN · LEFT · FOR
10 · ROTATIONS · THEN · LEFT · FOR · 2
ROTATIONS · THEN · B'DAY · AND · BLINK EYES
AND · PANDA DANCE

DAD'S ROOM
DOOR
RORA   BED

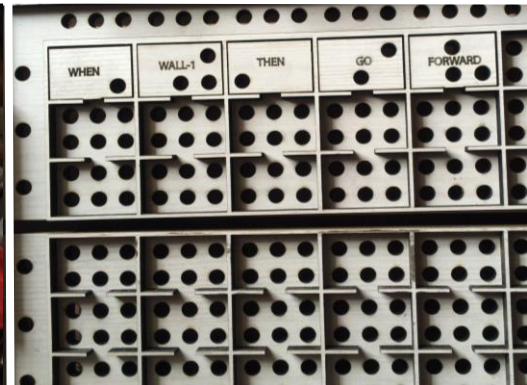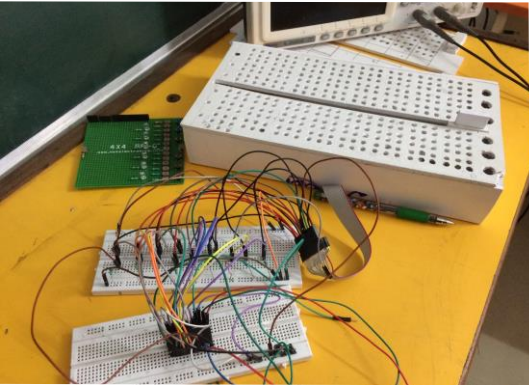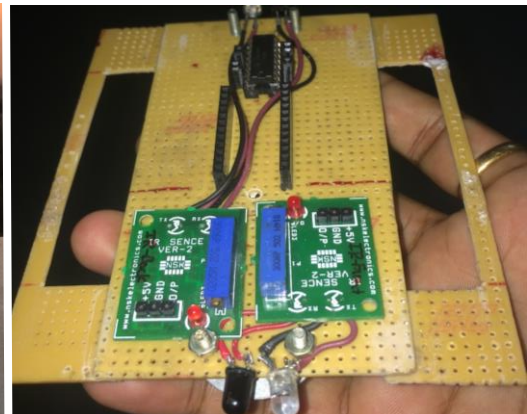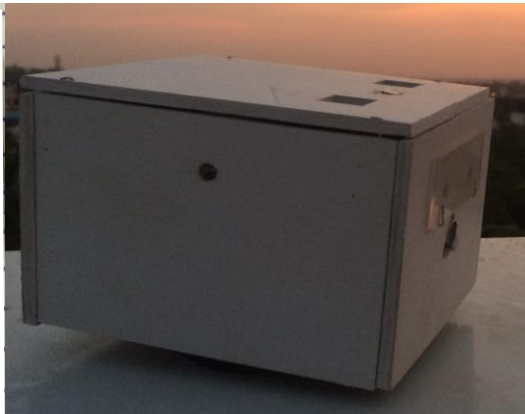Task: Rora will wish your Dad at midnight, making him smile at your simple act of Love.

How: Place Rora near the bed 8 hours before the midnight and measure the distance, route and turns from your bed to your dad's bed. Program your slate and surprise your dad.
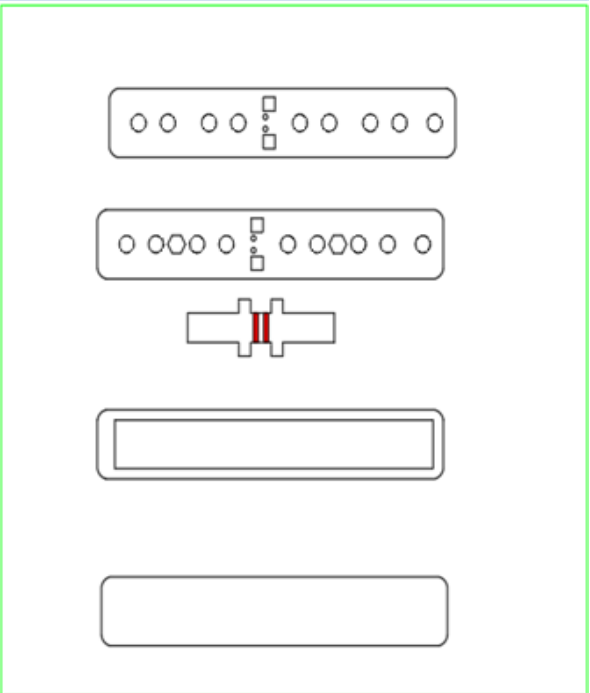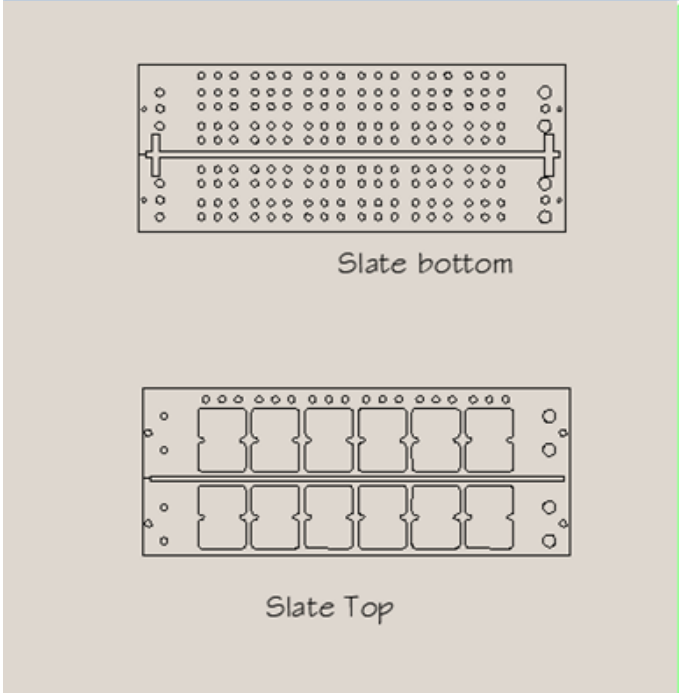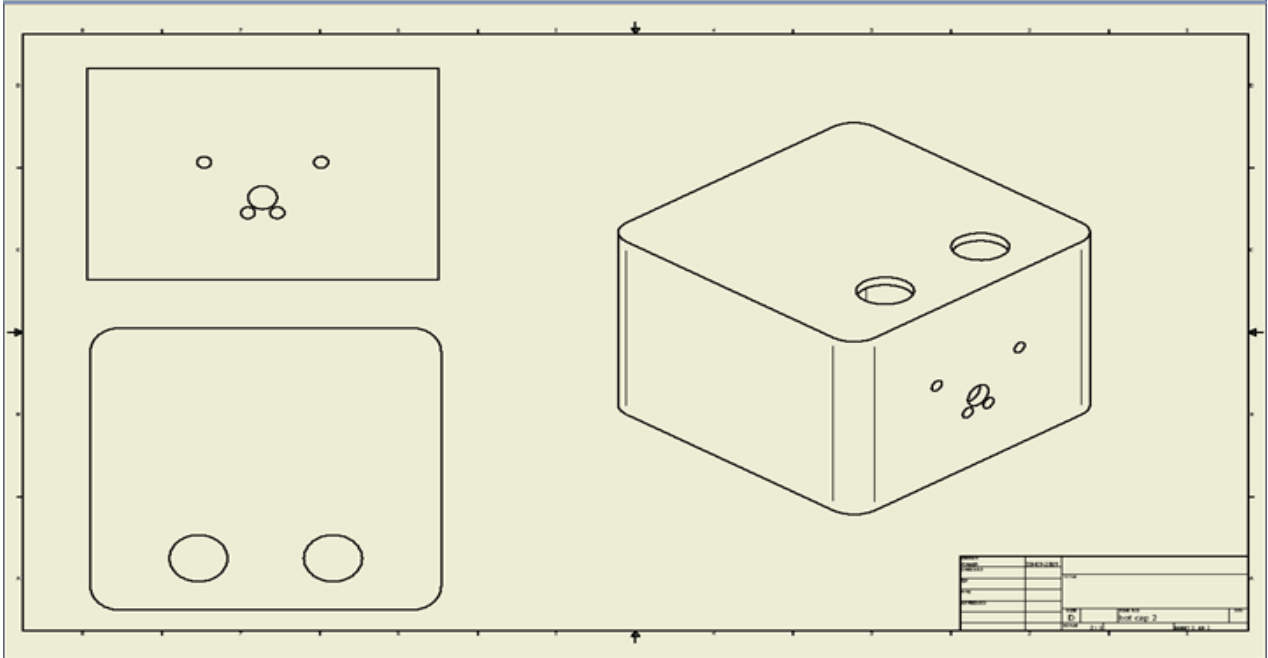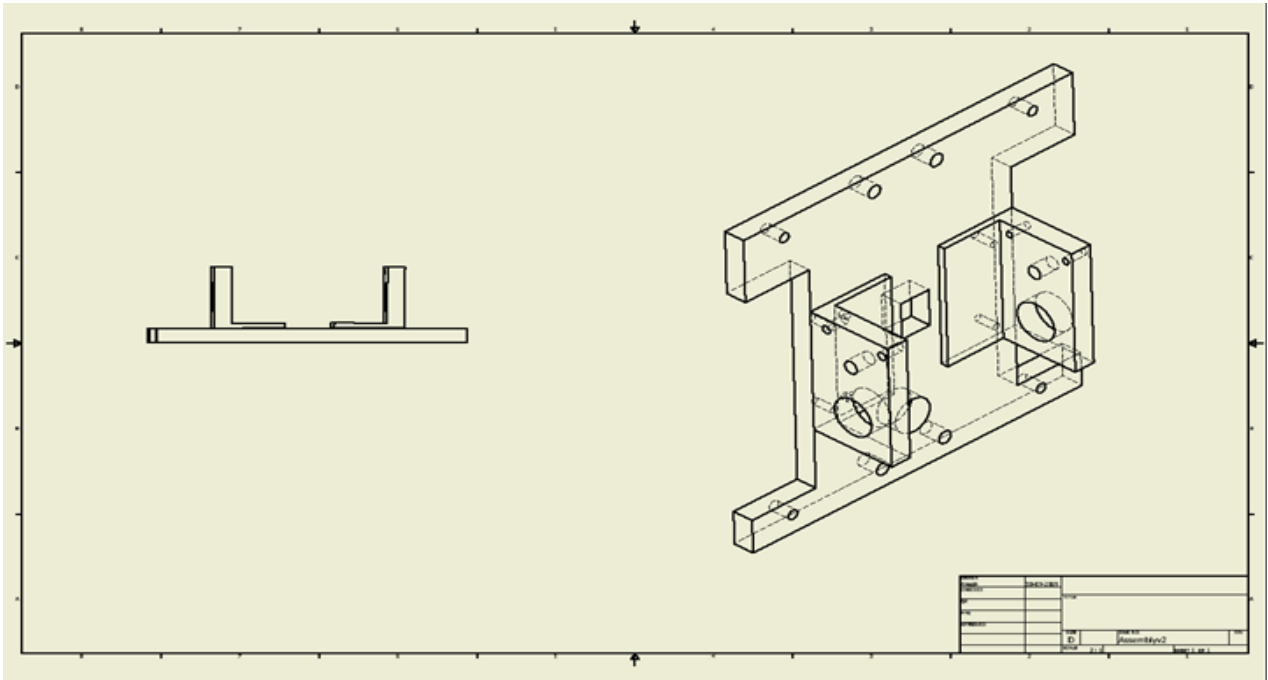
Product prototyping stages

Mechanical designs

Slate bottom

Slate Top
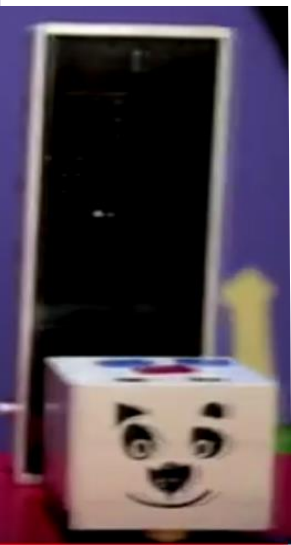
Mechanical designs | Coins design for different languages

और	अगर	जब	जन्मदिन	0	8
पलक मारना	दोहराये	दायाँ मोड़	बजर	1	9
ताली	उल्टा चल	रुके	चक्र	2	
अंधेरा	बाएं मोड़	तब	बारिश	3	
अन्यथा	मिनट	स्पर्श	रोशनी	4	
फीट	फिर /(आगे)	आगे बढ़ो	इंतज़ार	5	
जालो	या	दीवार	डिग्री	6	
घंटे	नृत्य	वापसी	सेकंड	7	

Hindi

ಮತ್ತು	ಒಂದು ವೇಳೆ	ಯಾವಾಗ	ಜನ್ಮದಿನ	0	8
ಕಣ್ಣು ಮಿಟುಕಿಸು	ಪುನಃ ಮಾಡು	ಬಲತಿರುವು	ಬಜರ್	1	9
ಚಪ್ಪಾಳೆ	ಹಿನ್ನಡೆ	ನಿಲ್ಲಿಸಿ	ಚಕ್ರ	2	
ಕತ್ತಲೆ	ಎಡತಿರುವು	ಅವಾಗ	ಮಳೆಬಂದಾಗ	3	
ಇಲ್ಲದಿದ್ದರೆ	ನಿಮಿಷ	ಸ್ಪರ್ಶ	ಬೆಳಕು	4	
ಆಡಿ	ನಂತರ	ಮುನ್ನಡೆ	ನಿರೀಕ್ಷಿಸು	5	
ಹೆಜ್ಜೆಗಳು	ಅಥವಾ	ಅಡ್ಡಗೋಡೆ	ಡಿಗ್ರಿ	6	
ಗಂಟೆ	ನೃತ್ಯ	ಹಿಂತಿರುಗಿ	ಸೆಕೆಂಡ್	7	

Kannada

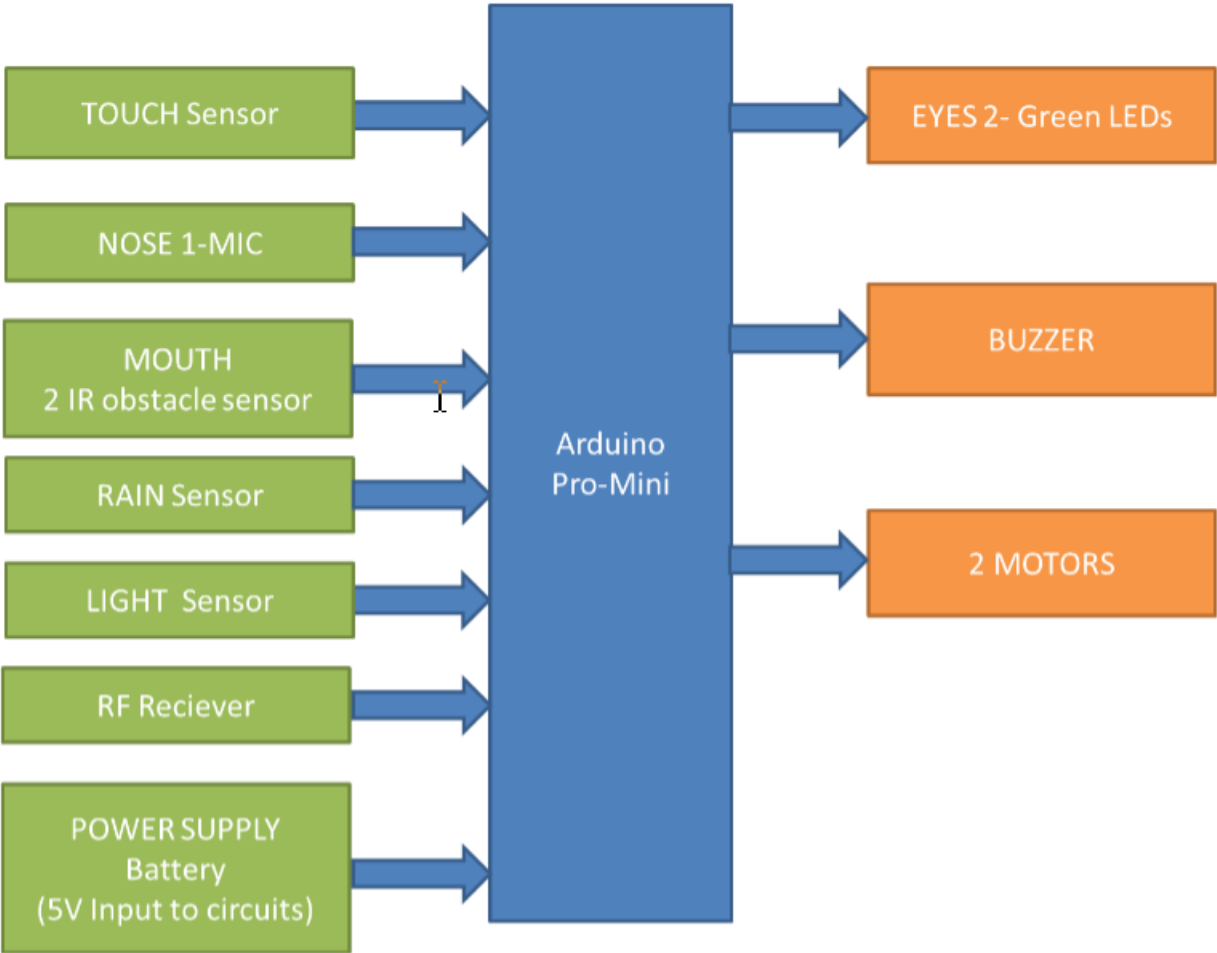|					
AND	IF	WHEN	B'DAY	0	8
BLINK EYE	REPEAT	RIGHT	BUZZER	1	9
CLAP	MOVE REVERSE	STOP	ROTATION	2	
DARK	LEFT	THEN	RAIN	3	
ELSE	MINUTES	TOUCH	LIGHT	4	
FEET	NEXT	MOVE FORWARD	WAIT FOR	5	
GO	OR	WALL	DEGREES	6	
HOURS	DANCE	RETURN	SECONDS	7	

English

Braille : Default, Coin holes are designed with Braille style
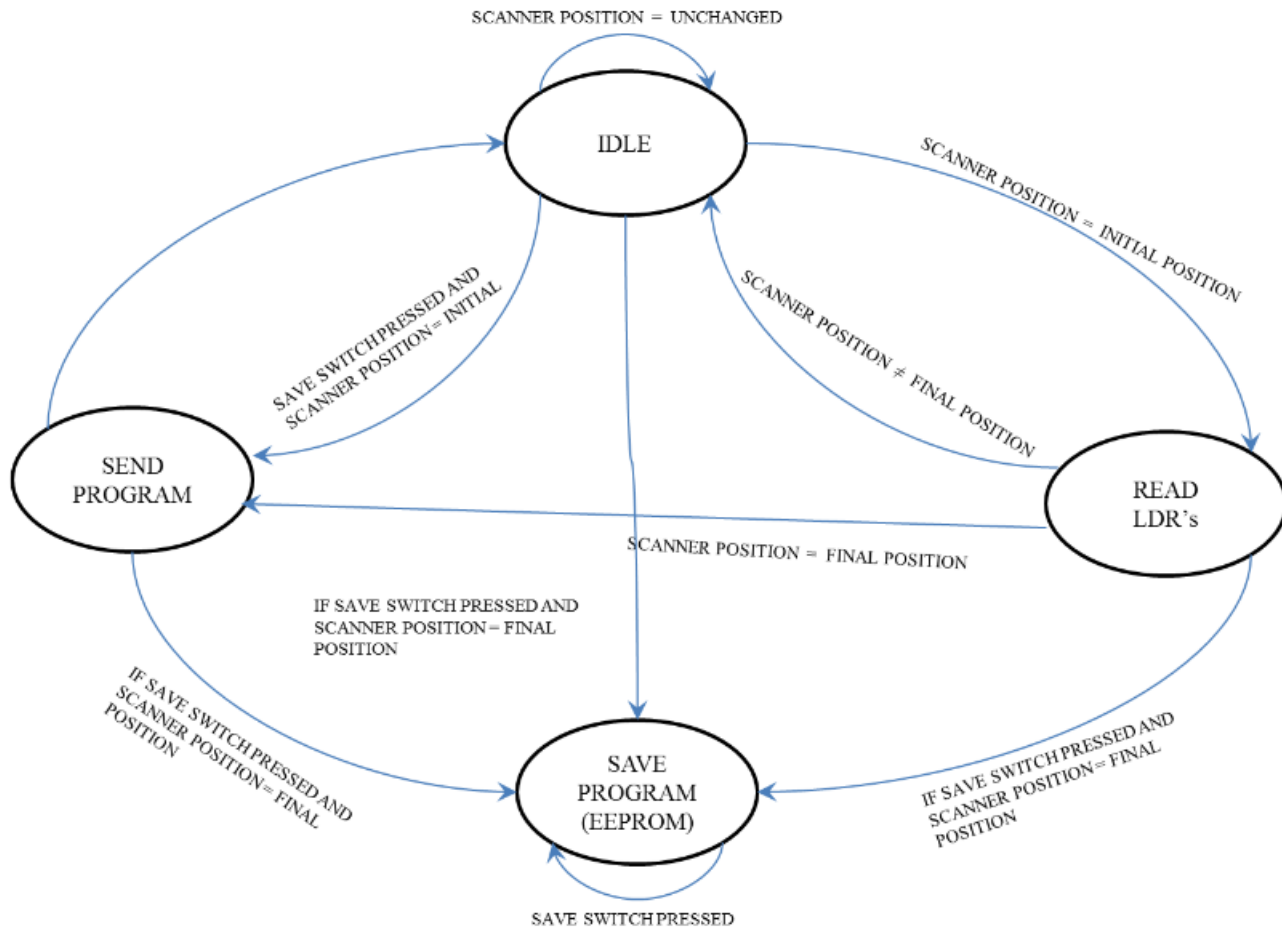
Hardware Design | Slate Hardware Block Diagram

Inputs	Arduino 2560 (MEGA)	Outputs
Scanner (9 IR Transmitters)		Scanner (9 IR Recievers)
Save Switches (4 Tic-tac Switches)		Erro LEDs (4-5V Tricolor LEDs)
Scanner start IR Sensor		Scanner end IR sensor
POWER SUPPLY Adopter/Battery (5V Input to circuits)		RF 433MHz transmitter

BOT Hardware Block Diagram

Inputs	Arduino Pro-Mini	Outputs
TOUCH Sensor		EYES 2- Green LEDs
NOSE 1-MIC		BUZZER
MOUTH 2 IR obstacle sensor		2 MOTORS
RAIN Sensor		
LIGHT Sensor		
RF Reciever		
POWER SUPPLY Battery (5V Input to circuits)		

Hardware Design | Slate and BOT PCBs

Software Design | Slate Software State machine

BOT Software State machine

*BIN – BOT IDENTIFICATION NUMBER
*SIN – SLATE IDENTIFICATION NUMBER
*prev_check – PREVIOUS DATA CHECKSUM
*curr_check – CURRENT DATA CHECKSUM

Thank you!