Lesson 23 – Coding Projects with mBot

Coding Projects with mBot

mBot is coded in three steps:

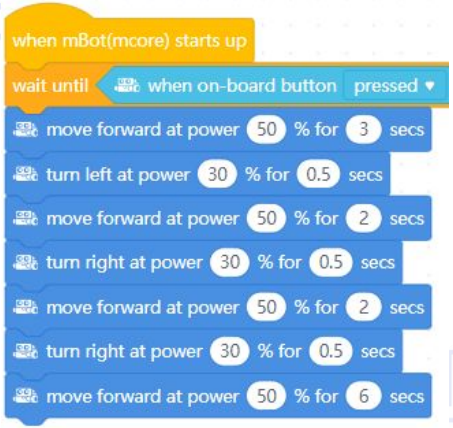
- **Assemble the mBot.**
- **Test it in manual mode.**
- **Start coding. Its procedure is like that for Codey Rocky.**

Project 60. Controlling the Basic movements of a Wheeled Robot

This project is designed to cover the various aspects related to movements of mBot.

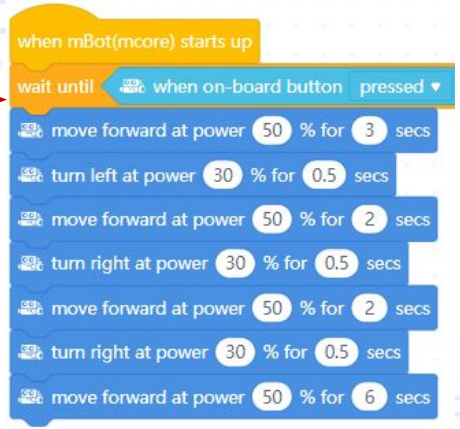
We can control:

- **Forward move.**
- **Left & Right turns.**
- **Speed of move by controlling its power.**
- **Duration of move.**



Notes: 1. Coding is done in upload mode.
Statement
in line 1 is displayed only in this mode.
2. Make statement in line 2 using sensing block.

3. This acts as the executive trigger
for the mBot.
2. Notice the effect in case this line is not put
in the code.

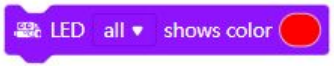


Project 61. Changing & controlling the color emitted by an LED

Aim of this project is to learn the changing of color of an LED through code. We want you to first try it yourself.

Say we want to change the color from red to purple, to green & finally to blue.

Think how it could be done. Try using this along with a suitable trigger.

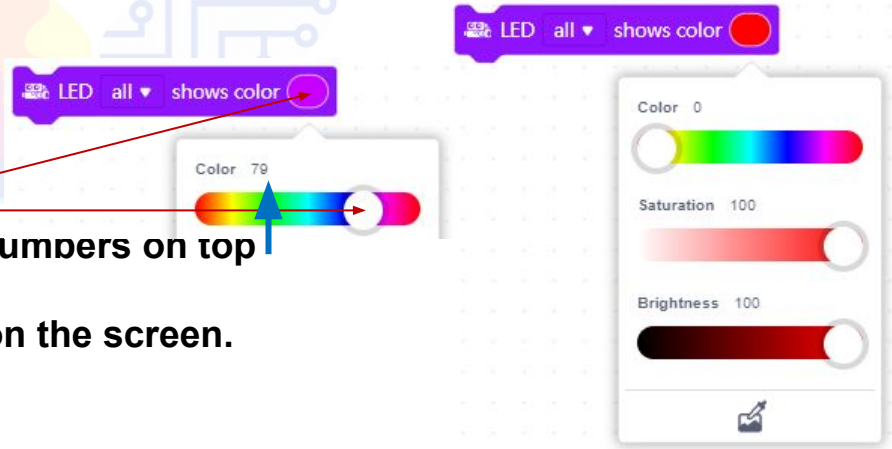


Note the options in its dropdown. Think when these could be used.

Now try changing its color from red to purple. Think how it could be done.

Yes, you are right. To change color, click on the color (red).

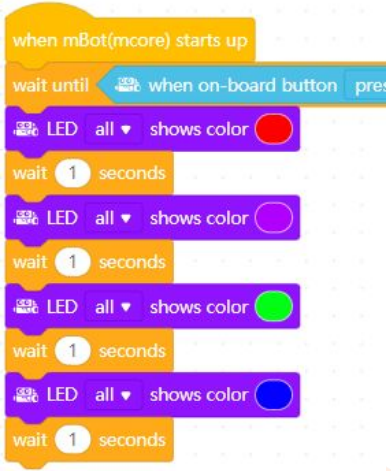
In the dropdown
move the white
circle to the left.
Its color keeps changing. So do numbers on top
(changed from 0 to 79)
Stop at the desired color & click on the screen.
Color is selected.



Play with Saturation & Brightness options.
Observe the effects they produce.

The final code for this is as shown here.

Note the use of wait blocks.
It is similar to voice bubbles in sprites.



Project 62. Making a Musical Keyboard through Code

We want mBot to play 8 notes – A2, B2, C2, D2, E2, F2, G2, & C4.

Give a thought on how it could be done.

Hint 1. Look at using 

or: 

Hint 2. Since each note requires a separate trigger, this will be available only if When space key pressed statement is used.
This statement is available only in live mode.

The Code for this project is shown here.

Now add more keys with different notes by selecting them from the dropdown.

Play the keys like a piano & see the effect.

Project 63. Mimicking a Cars Gear box containing Four Gears

Mimicking is the act of copying someone or something.

In a car as the speed increases, we keep changing the gear.

Now think if we need to do the same using an mBot, when what all actions we need to perform & in what sequence?

You are right.

We need to keep increasing its speed from say 20 % initially & going upwards in say steps of 20 %.

By doing this, we will be mimicking the actions of a gear box.

Now think how it will be done?

Hint 1:

IR remote has got many keys. Some of these can be used as a trigger to increase the speed of mBot from one to the next.

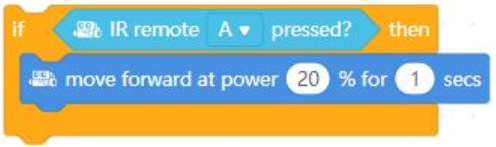
A suitable statement for this 

exists in the sensing blocks.

Now see how you could use this to code?

Hint 2:

Mimicking involves conditions, thus if statement is required for each action.



Now again think how the final code can be made?

Hint 3:

Now since we must change gears four times every time the mBot moves we need a forever loop.

Try adding one & doing it yourself.

Final code is as shown.

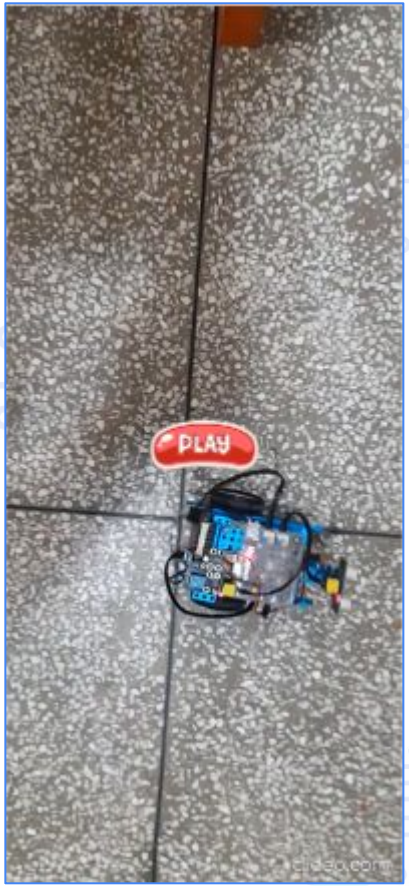
Project 64. Basic Dance Movements by a Mobile Robot.

In this we want the mBot to execute two basic dance movements.

These are, turn left with a jerk, & then turn right, & then keep repeating.

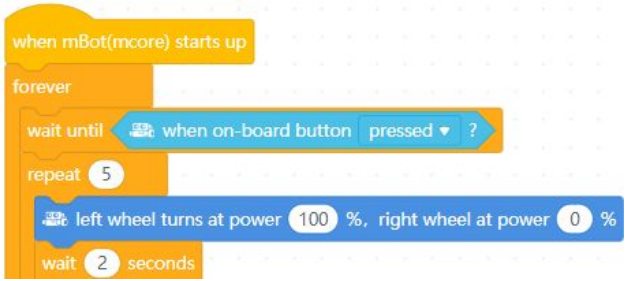
To do this, first see this video.

Now think how you can code it.



Hint: First code for only one movement.
This code is as shown:

Now complete it yourself.



Project 65. Robot Mimics a Child following its Mother.

In real life when a child sees its mother, it starts to follow her. In this project, we want our robot – mBot to do the same when it sees us.

To do this, first think of the possible steps involved.
If you do not get an answer, click & see the hints.

Hint 1. Use an ultrasonic sensor as the eyes of the child.
Click for next hint.

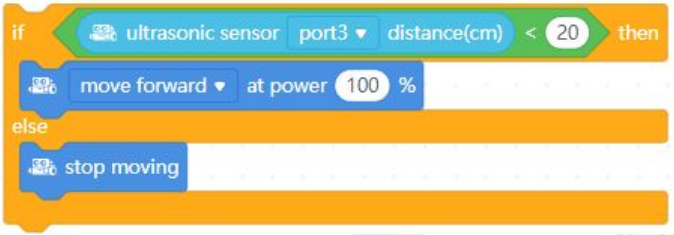
Hint 2. Bring your hand in front of the sensor to ensure the child seeing its mother (you).

Click again, to understand the making of this interesting code.

No problem if you did not get the code. Kindly follow the steps:

1. First code the part – When a child sees its mother it starts following, & if it does not see, it stops.

The code for this part is as shown here.
Note we have specified <20 as the distance at which the child starts seeing its mother.
It could be increased.

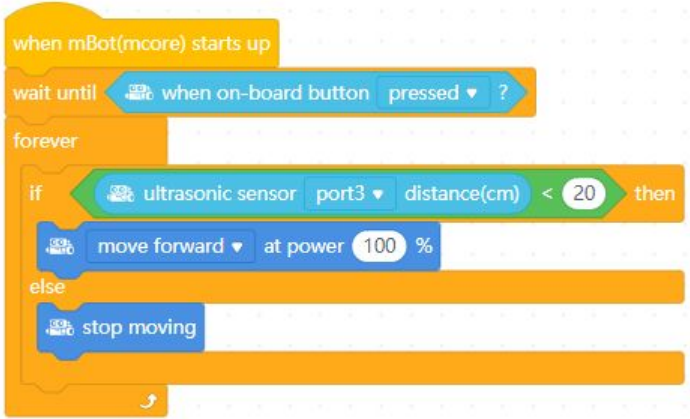


Because the child must do so forever put this in a forever loop.

3. Now add the trigger.

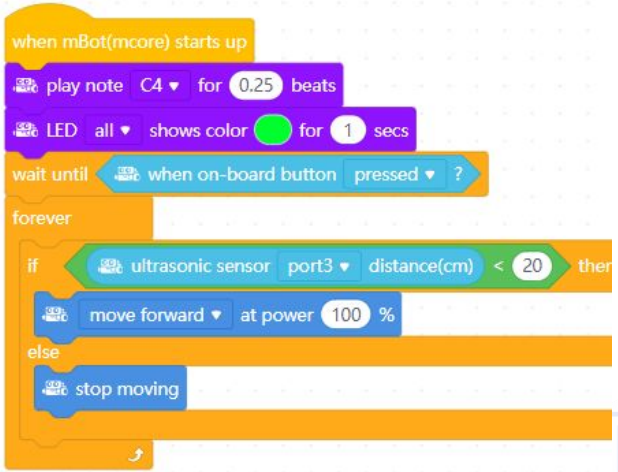
The basic code is ready.

Upload & try.



Now if desired
you could add some frills
(lines 2 & 3).

Upload & try.



Project 66. Robot Moving in Geometric Shapes - Square

This is similar to the project 59 we did with Codey Rocky. Kindly try it yourself.

Try other shapes as well.

Project 67. Understanding clockwise or anti clockwise Movements of robots & machines.

This is similar to the project we did with Codey Rocky.
Hint: **In clockwise the left wheel must move faster than right.**

Kindly try it yourself.

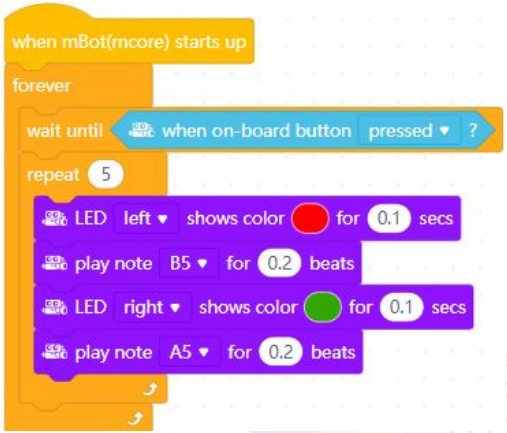
Project 68. Making a Simple light & sound show through Code.

This is a mix of project 60 & 61 above.

Run the code and see for yourself.

Now think of how you can add more fun into this project like:

- **Making more & better music.**
- **Adding more colors.**
- **Changing durations etc.**



Project 69. Controlling Actions of a robot Based on Light Intensity

In this project, mBot changes the musical notes it plays based on the intensity falling on it.

Kindly see the video to understand.

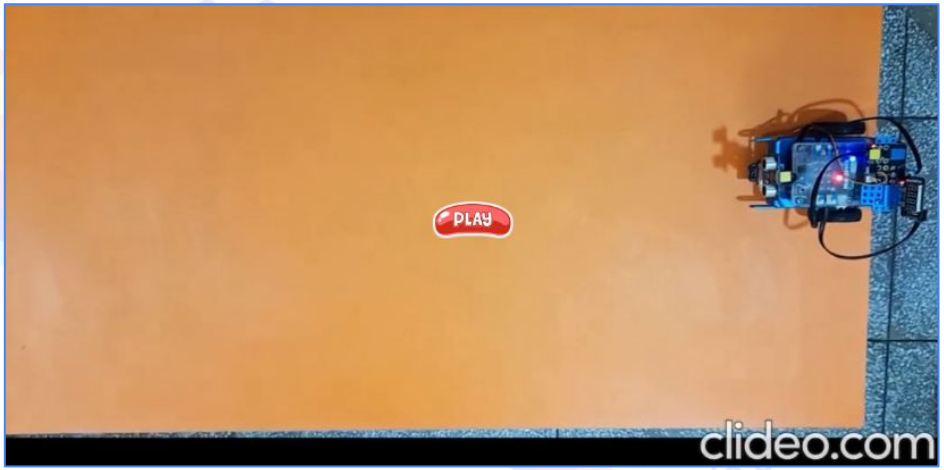
Try it yourself.

Experiment more by adding more musical notes.

Project 70. Movement of a Robot along a zig zag path

Kindly see the video
to understand the project.

Try it yourself.



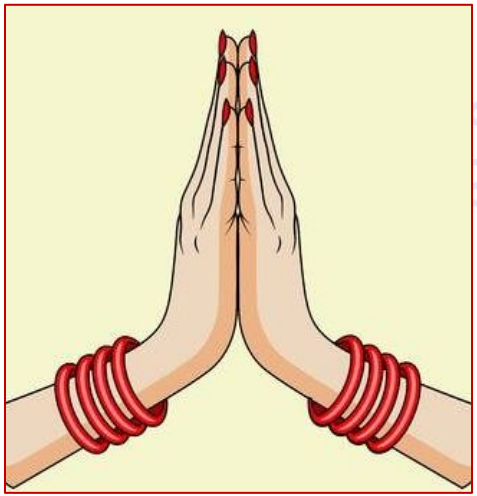
Having done this now try doing it in reverse.

Next, try mixing with other projects above, to come out with imaginative solutions.

Takeaways…

- This is just the start of what you can do & learn from using mBot.
- It has the potential to place you on the path of international robotic competitions.

End of Lesson 23



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