# **Cs 100 RS MATLAB Project Report:**

MATLAB Project: 2D Coaster Maker

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**Summary:**

This is a coaster maker game. In this game you have to make the path of the coaster and then I will run on it. While making path you have to keep this in mind that you can only make 4 lines and physical rules are applied i.e. speed decreases while going up and vice versa. Also the levels are locked and you have to unlock them by taking 2 coins in each level. Use bonus levels to unlock further levels beforehand.

**Usage:**

Start the game from ***runme.m.*** You will be asked your name and then you will select the level.

**Options:**

1. There is option of name you can input.
2. There is option of mute and sound given in the game.
3. There is the option of selecting level but they are initially locked.
4. There is always option of quit and draw mode.

**Features:**

1. There is perfect GUI.
2. The instructions of the game are clearly written.
3. There are 2 bonus levels.
4. The bonus levels are opened when you get all of the coins in the level.
5. Each of first two levels has its own bonus level.
6. The train runs on our own path.
7. The dragging feature of the path is useful to make appropriate path.

# **Theory:**

There are several equations of motion are used like ***T.E=constant***, ***Vf^2 – vi^2 = 2gs*** , ***vx=vi.cos(th)*** and ***vy=vi.sin(th)*** etc. Also I used several equations of calculus and transformations to ensure the correct rotation of the coaster. Also I used vector equations to define correct coordinates of the upper part of the coaster and the tiers of coaster.

# **Programming:**

## Unusual Features:

To ensure that no one gets the bonus level and next levels before fulfilling the requirements, I have used some conditions which no one can crack unless he knows my coding.

## Structure:

## 

1. Main file is run by ***runme.m***.
2. ***Start2.m*** has the partial GUI.
3. ***Train(x1,y1)*** makes the train of the program.
4. ***Level1.m*** has first level.
5. ***Level2.m*** has 2nd level.
6. ***Level3.m*** has 3rd level.
7. ***bonuslevel.m*** has first bonus level.
8. ***Bonuslevel2.m*** has 2nd bonus level.

# **What I Did:**

I did following works in order to make my project;

1. Formed graphics with GUI and pictures.
2. Make 3 levels and 2 bonus levels.
3. Tried to run train according to physical rules.
4. Added sound.
5. Divided my program into different scripts and functions.

# **What I Learned:**

I learned;

1. To divide problem in small pieces.
2. To make different types of functions and scripts.
3. Different commands of MATLAB.
4. How to work on a specific problem without any initial conditions provided.

# **Personal Experience:**

My personal experience was great and I am very excited to work on MATLAB and other programing languages because I would pick CS major for myself. I did my level best to achieve my goal but some other problems of my T.A I couldn’t get enough guidance which I really regret. Over all course was very fine and great and I learned a lot from this. But I am little offended with the T.A.’s (some of them) which were not cooperated toward us. Also the office hours of instructors were not enough for us to get proper guidance. I completed all of my labs and remained very enthusiastic towards them. If my project didn’t fulfil your requirement please don’t judge me on this because I had not enough knowledge (both about physics and CS) to make this difficult project.