Movie Scheduling in a Multiplex mall

A PROJECT BY POWER 3

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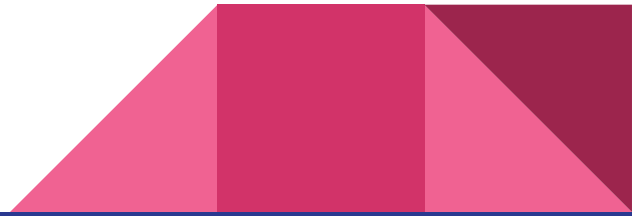
Problem Statement

To develop a **schedule** for screening of movies in a theatre, with factors such as no of screens, formats (2D/Dolby Atmos/3D/IMAX), languages, target audiences, budgets and release dates considered, to **maximise the profits** using a **web application** as a user interface that allows multiple theatres to store the details of their screens with their account and enter the movie inputs



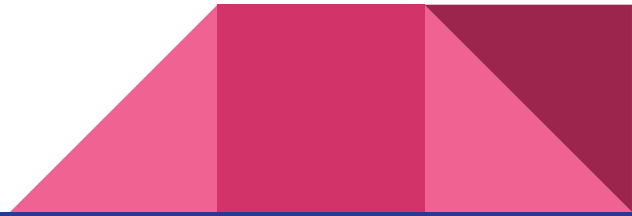
Input and Output

Input

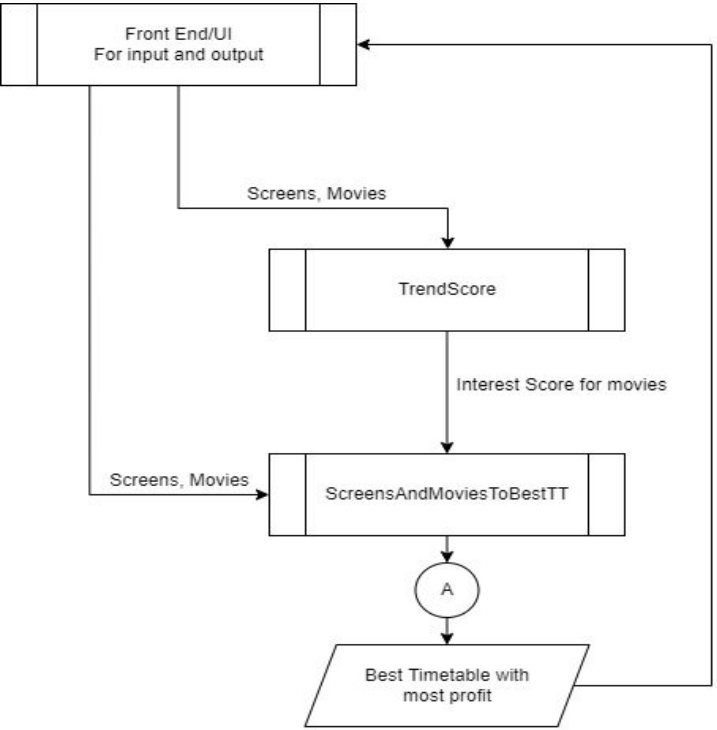
Screen inputs: Name of Screen, Showtimes for screen, Features of the screen (2D/Dolby Atmos/IMAX/3D)
Movie inputs: Name of Movie, Release date, Budget, Language, CBFC Certification (audience), Features required in a screen for the movie to be played.

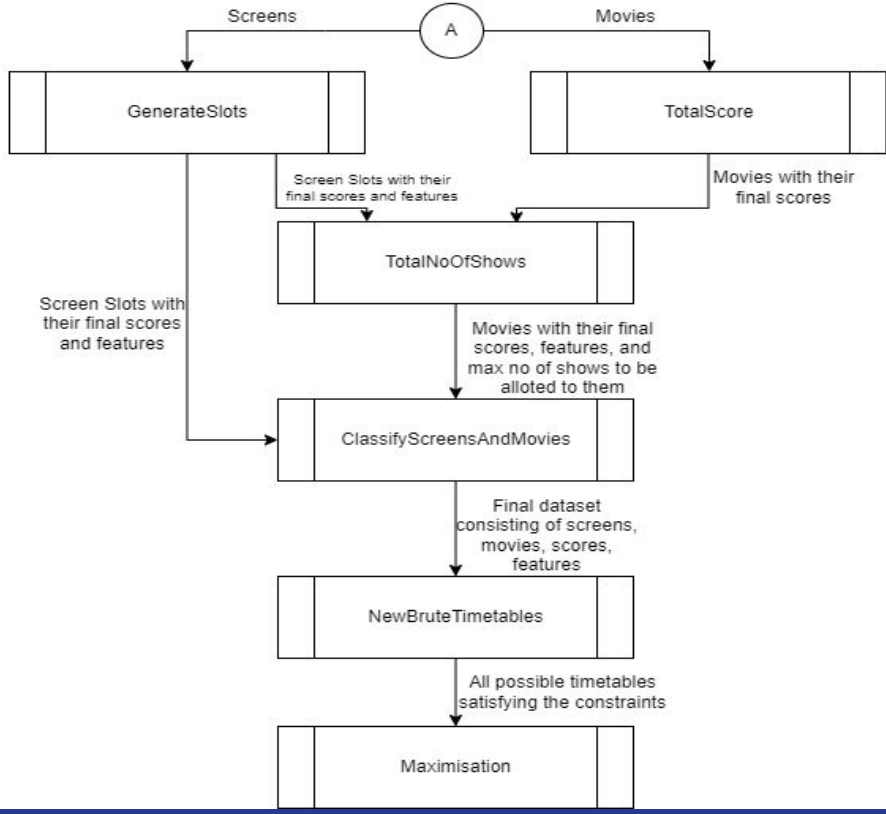
Output:

Best Time Table. The most profitable timetable taking into account the input factors and the compatibility of movies playable in a particular type of screen.



Architecture Diagram





Approach/Technique

- For generating the final Best Timetable, we have used a modified Brute Force method to generate all possible timetables after taking into account the input factors and screen-movie compatibility
- The process follows the sequence:
- We generate a score out of 20 for each Screen-Slot based on the features of the Screen and the timings of that slot. (3D screens have higher scores, Evening shows have higher score).
- We also generate a score out of 10 for each movie.
    - 30% of the score relies on **real-time data** from google trends
    - 30% score for normalized budget
    - 10% for Language
    - 10% for release date
    - 20% based on Target audience.

Approach/Technique

- We classify movies and screens based on their features as 2D/Atmos/IMAX/3D.
- ★ We find out the maximum number of shows allowed for the movies proportional to their scores.

  We generate multiple timetables using our brute force algorithm where the screen-movie compatibility is taken care of (Dolby Atmos movies in Dolby Atmos enabled screens only. 3D movies in 3D enabled screens only, etc)

  We evaluate those Timetables to find one Timetable where the sum of (slot score * movie score) is the maximum.

- We repeat the above process for each feature-type of screens and movies and join the four BestTimeTables.
- The result is THE BEST TIMETABLE.

Approach - Front end (Web Application)

- The team has extended the timetabling system to a web application.
- When a new user signs up, they enter the specifications of the screens in their theatres.
- (Screen Name, showtimes of each screen, Features of the screen).
- This detail is saved in a json file in the form of a dictionary for each theater.
- When the user logs in again, he/she is shown the previously entered screen details in the profile page and is asked whether they want to proceed with those specifications or alter the same.
- Once the screen details are finalized, the movie inputs are taken and added one-by-one to a pane on the side.
- After adding the required movies, user clicks the submit button, it invokes the backend program and the output-timetable is displayed on a fresh page.

Constraints

HARD CONSTRAINTS:

- 2D-only movies can be played in 2D-only screens alone.
- 2D-Dolby Atmos movies can be played in 2D-Dolby Atmos screens alone.
- 2D-IMAX movies can be played in 2D-IMAX screens alone
- 3D movies can be played in 3D screens alone.
- A movie cannot be played for more than a stipulated amount of screenings. (the threshold is a derived quantity from an algorithm the team designed)
- Most importantly, generating the maximum profit

SOFT CONSTRAINTS

- Evening shows of a screen have higher score.
- 3D/IMAX/Atmos/2D screens have slot scores in descending order.
- Movies in Tamil have higher score than movies in other languages
- Movies with higher budget invested in distribution have a higher movie score
- Movies with Certification U or U/A have higher score than A.
- Movies released recently will have a higher score than movies released earlier.

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Django Tutorials by Corey Schaffer

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