Please formulate the mathematical model for the following business problem, stating the following in very clear terms:

- *Sets*
- *Parameters*
- *Decision Variables*
- *Objective function*
- *Constraints*
- *Necessary assumptions*

Instructions:

- *Please ensure that the formulation does not include any non-linearity.*
- *You can write the mathematical model in MS Word, MS Powerpoint, or any other medium of your choice. Alternatively, you can write the model on paper and upload the scanned image.*
- *Please make any assumptions which you feel are necessary for solving the problem.*
- *If you think there is any rule/metric which the model should try to attain, but is not mentioned in the document, please feel free to add that.*

Deadline: 6th February 11 PM.

Weightage: 15%

Business problem:

Round Robin match scheduling

Constraints/Objectives

- All teams should be playing twice with a team – one home match, one away match
- More interesting matches should happen on weekend (so that the viewership increases)
- > 1 interesting match should not be played at same time (to increase viewership)
- Matches played by a team should be distributed in time
- Min and max gap between two matches played by a team
- Distance travelled by a team for >1 consecutive away match should be minimized. This should be balanced across teams.
- Home and away matches played by a team should be distributed in time.
- Start and end dates of the tournament
- If the match is abandoned on a particular day due to rain, then the match would be played on the next day.
- Smaller stadiums should get the less interesting matches
- Do not schedule a match in a venue on a day if:
    - There is some big event in the city on that day: eg: Ganesh Chaturthi in Maharashtra

  - There is some event at the stadium on that day

- Number of Day & Night matches played by a team should be balanced across teams.
- Fairness with respect to match allocation in different zones (E/W/N/S)

Output

When and where should a match between 2 teams be scheduled