Project Related F.A.Q (for Interview)

**1. What is the Project Mean for you?**

This project is an overview of human-induced dynamic loading before building, a simulation tool in Python. The Duhamel Integral is a versatile and easy to deploy method of simulating the dynamic response of a single degree of freedom system. In this project, we’ll start from scratch and build up an understanding of how and why the Duhamel integral works. We’ll also look at how to solve it, analytically and numerically. Then we’ll use it to do something interesting - simulate the vibration response of a footbridge, induced by a pedestrian crowd.

2. What are the Project Features, project motivation behind this project, Impact of this project.

It impacts the concepts and undertaken the understanding of a Structure loading concept via visualisation such an animation and simulations.

We can built much more impact by practical module using same programming language with more civil related projects.

This project creates impact on how we think we can design a structure or analyses a structure throw coding and gets a medium of visualisation.

In a long run we can include a module such this to built or to summarise the sensibility and serviceability of a bridge.

3. What Language or What Framework, what Library, what function you have used or other technical stuff that will be asked.

In this project the main programming language used as Python, we are using the Jupiter NoteBook environment as there is inline graphic support is there built in. Which help me to do visualisation with certain library to use such as NumPy and MatPlotLib.

Matplotlib is more aimed toward making publication-quality graphics, whereas pyqtgraph is intended for use in data acquisition and analysis applications. So I use MatPlotLib.

4. Did you do this project as alone or in a group?

Yes I did the project assign to myself, without help of college teachers this project can not been done successfully.

5. Why you are using this technology?

This kind of similar projects can be done in many other programming language or platform or may be Civil Engineering based software. But, In this project most of the thing are related to numerical calculation and data visualisation included the simulation and for the help of further library use cases I choose Python and python related libraries in use which will help me ease of use to calculate and simulate this project.

6. Challenging part of this project for me? What are the difficulties that I face during this project.?

There is a portion where I need to calculate dynamic load factor of human body based on Indian Body. For that I take encounter some research papers from MIT press that Indian Body dynamic load factor can be taken as 30% to 40% of body weight.

Another thing I have faced about to calculate Pacing frequency to determine, also in that section there is no indited code. But I did some study from 2-3 research paper which I also mentioned about reference section of this project. In that study I come across a topic where I have seen many concepts various walking velocities of Human,

It varies from place to place and country to country, e.g. Indian Humans are walk much higher pace compared to Non-Indians. Also a pedestrian bridge is near to the park or a resting place people tends to move slowly or if a market or train station near people used to walk faster and walking velocities will be higher

There are sudden challenges where I face difficulties to overcome such as error in sudden calculation, plotting formula with equitation to diagram.

7. Future Implementation of the project?

In order to address the some of the further work, a parametric study of the proposed virtual crowd-structure interaction model can be carried out in cycle and moving portions. More complex structure can be addressed with help of more dynamic response.

1. A much needed bridge has other concepts like Cycling Pedestrian, running pedestrian, etc as classification can be added.
2. Those who are not moving frequently in bridge or acting as deal load stereotype can be added in future.
3. Bridge/Structure Categories or structure state limit can be added in future with dynamic material in study.

8. How to do the whole of this project and END to END flow of this project to be?

9. What I learn from the project?

After Completed I have a simulation tool for assessing the vibration serviceability of any structure that experiences pedestrian loading. Specially I have learned and addressed different case types for Pedestrian loading and harmony to build

10. Deploy the project to

I will upload it on Git as a reference of deploy