A. What is the URL of your narrative visualization?

1. **[1 point]** Does the URL connect to a functioning web page?

B. Upload a PDF file essay describing your narrative visualization as required by the assignment instructions.

1. **[5 points]** Does the essay state what messaging was intended by the narrative visualization?

* **Messaging.** What is the message you are trying to communicate with the narrative visualization.

This narrative visualization enables users to understand how India has been dealing with its population growth. The role of education in stabilizing the population of a country.

With this narrative visualization we leverage data visualization to communicate how India’s population compares to the top 10 populated countries of the world based on factors like - 'Population', 'Population Density', 'Fertility Rate', 'Growth Rate'. We then enable the user to explore and understand the decadal population growth of the states (categorizing them into EAG and Non EAG states) to identify key focus areas for the government to slow its population growth.

The message we communicate with this narrative visualization is the impact of education (literacy rate) with population control by demonstrating the correlation between fertility rate and literacy rate for all Indian states. It is important since overpopulation puts additional pressure on the environment, natural resources, and economy. The final message being the importance of putting the focus and introduce policies for the EAG states to improve the literacy rate to further reduce the fertility rate.

**Note:**

* **EAG state** refers to the eight socioeconomically backward states of Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttaranchal, and Uttar Pradesh which lag in the demographic transition and have the low literacy rate and high fertility rate.
* **Fertility rate** of a population refers to the average number of children that would be born to a woman over her lifetime
* This project aims to provide a narrative around how urbanization across the globe in different countries is driving GDP and mobilizing the population to certain big cities.  
  As a result of this the cities are getting bigger and bigger in area with each passing day and finally resulting in depletion of forest area. This trend might prove harmful by severly damaging the environment with less forests and incresed pollution in certain parts of the country.

C. Narrative Structure

1. **[2 points]** Does the essay indicate which structure the narrative visualization was designed to follow (martini glass, interactive slide show or drop-down story)?
2. **[3 points]** Does the narrative visualization follow that structure?

* **Narrative Structure.** Which structure was your narrative visualization designed to follow (martini glass, interactive slide show or drop-down story)? How does your narrative visualization follow that structure? (All of these structures can include the opportunity to "drill-down" and explore. The difference is where that opportunity happens in the structure.)

This visualization follows the ‘Interactive Slide Show’ structure which enables the user to navigate through the different slides/ scenes while giving them the ability to access/ interact with the data presented to them on each slide/ scene. This follows the hybrid structure mixing author led and reader led paths i.e. it follows an author led path through the slideshow – using link in the nav bar – ‘Home’, ‘Next’ and ‘Previous’ to enable the user navigate from one scene/ slide to another while also giving them an ability to interact with data presented using charts on each scene/ slide – like drill down (tool tip), change state of a chart by selected different parameters (buttons), etc (or they can chose to continue to the next/ previous slide).

3, 4Our narrative visualization follows “Martini glass” structure. This visualization has total three visible scenes. In first two scenes, we follow author driven approach where we begin the narrative visualization by showing interesting default views and annotations allowing very limited interaction. Here we summarize top level data of top 5 emitters’ contribution to world’s total CO2 emission and annotate that with interesting summary statistic to increase user interest in further exploration.

3, 4After conveying the message that few countries do most CO2 emission and their progress in fixing this problem in first two scenes. We move on to the next, reader driven stage where we allow user to explore data by interacting with visualization. At this stage (third scene), we allow user

* •  to use slider so that user can go back and forward in time and see trend of all countries together.
* •  to drill down specific country’s CO2 emission trend by allowing them to click on the country bubble.
* •  to filter countries based on their income group so that correlation between GDP and CO2 emission can be explored.
* •  to view summary of each country using tooltip.

D. Visual Structure

1. **[2 points]** Does the essay indicate what visual structure is used for each scene?
2. **[1 point]** Does the essay indicate how the visual structure ensures the viewer can understand the data?
3. **[1 point]** Does the essay indicate how highlighting is used to get the viewer to focus on the important parts of the data in each scene?
4. **[1 point]** Does the essay indicate how the visual structure helps the viewer transition to other scenes, to understand how the data connects to the data in other scenes? Linear

* **Visual Structure.** What visual structure is used for each scene? How does it ensure the viewer can understand the data and navigate the scene? How does it highlight to urge the viewer to focus on the important parts of the data in each scene? How does it help the viewer transition to other scenes, to understand how the data connects to the data in other scenes?

The visual structure used for this narrative visualization if of a form of a website where each webpage represents a scene. We have used a consistent visual structure to depict each scene where each scene follows the same template and color scheme to maintain consistency to keep our user oriented throughout the visualization.

1. Header: This section shows the title of visualization along with the author information. We have used light red color (Hex: #FF6654) for the background and while to display the visualization title, author information. The text is center aligned.
2. Navigation Bar: This section displays the links – ‘Home’, ‘Next >>’, ‘<< Previous’ to enable the user to navigate between the different scenes. The navigation bar is placed at header and footer of the template. We have used brown color for the background and white to display the text. The navigation bar links are right aligned.
3. Body: We have divided the body section into two columns – ‘Article’ and ‘Chart’. The article section is used to display the text we want the reader to read to convey the story. The chart selection is used to display the charts to enable to user to explore and interact with the data. We have used the while color for the background and black color to display the text. For buttons we have used green color for the background and while to display the button text. We have used different chart types to ensure we are able to present the data to our user in the most efficient manner.

The consistent theme and ordering (we have placed the scenes in the story telling structure) across all scenes help in setting up the context for visualization. It allows the users to get familiarize with the visualization. This narrative visualization follows a journalism format to tell user a story to keep them engaged and help them understand the data for them to interact with them. For example, the first scene tells a story of how India compares to the top 10 most populous countries of the world. It sets a context (article section) to enable the user to start exploring the charts (Interactive Bar Chart and Line Chart) and interact with the data presented to them to visually see how India compares with the remaining countries (chart section). We have also used explicit (set of instructions on each scene) and implicit (buttons, links, etc) affordances along with highlights like annotations to assist the user further understand and interact with the data. This allows users to freely navigate through the scenes is the visualization and understand and connect to the data and presentation. As mentioned above, we have used this template and color scheme across each template to keep our user oriented and engaged with each scene i.e. while navigating they can only focus on the data and message communicated using the text, visual charts since the general visual structure remains the same.

The visual structure is based on web pages/scenes .Each scene is depicted using similar kind of layout and same template for visual consistency.  
The title/text for each scene is placed above the visualization and helps in setting up the context for visualization.

The visualization container which displays the data consistent for same type of chart with height 510px, width 980px, and semilar kind of text color for each scene of the narrative visualization.  
the graph varies as per the requirement of the scene to convey the narrative of the data in a proper way.The color in each visualization is consistant.

The scenes were designed for consistency to keep the viewer from getting disoriented through transitions.  
the order of the scenes are placed in a story telling structure.

5We have used consistent visual platform across the scenes. The layout has five elements 1) Visualization title and summary on the top. 2) Radio buttons to navigate between scenes. 3) Scene information and short summary on the left. 4) Legend on the top right side of the visualization and 5) the visualization itself in the center. All elements are placed at same location in each scene. We have ensured similar level of consistency while defining tooltips as well.

6, 7We have used radio buttons with chart label as a tool to navigate between scenes. This allows users to freely navigate between scenes and know where they are in the presentation. As user steps through, the visualization changes only the scene and its description while other general layout remains intact. It allows users to quickly become familiar with the visualization structure and allows them to focus on the data, visual and messaging. Short text in the left panel contains crisp summary which aids user to understand overall narrative of the scene.

7We have used color, size and length to highlight different important aspects of data. In the first scene (donut chart), our main goal was to indicate size of large CO2 emitters vs others. We intentionally combined data of all but 10 nations to visually highlight the fact that most countries together emit very less compared with top 10 emitters. Furthermore, we show percentage data for only top 5 countries, letting user focus on most important countries only. In second scene, we show top 5 emitters with colored annotations to show if country has reduced CO2 emission or not along with its income group. This helps user to quickly understand that rich countries are improving on CO2 emission. In third scene, we wanted to show relationship between income group, population and CO2 emission. We highlighted income group by different colors and population by size of circle. This helps user to visually focus on type of countries they want to analyze.

8In all three scenes, we show different details of data but at the same time focus on top 5 emitters. With this scheme, when user transitions from one chart to another, they do not loose context of the story and are still focused on top 5 emitters even when diving in details or looking at other countries data.

E. Scenes and Visual Ordering

1. **[2 points]** Does the essay identify the scenes of the narrative visualization?
2. **[1 point]** Does the essay discuss ordering (e.g. the order of elements in a chart or the ordering of scenes)?
3. **[2 point]** Do the charts used as scenes effectively present the data?

* **Scenes.** What are the scenes of your narrative visualization? How are the scenes ordered, and why

F. Annotations

1. **[2 points]** Does the essay discuss annotations?
2. **[1 point]** Does the essay discuss a template for the annotations?
3. **[2 points]** Are the annotations in the narrative visualization effective and consistent?

* **Annotations.** What template was followed for the annotations, and why that template? How are the annotations used to support the messaging? Do the annotations change within a single scene, and if so, how and why

G. Parameters and States

1. **[1 point]** Does the essay identify the parameters of the narrative visualization?
2. **[1 point]** Does the essay identify the states of the narrative visualization?
3. **[1 point]** Does the essay indicate how are the parameters are used to define the state and each scene?
4. **[1 point]** Does the narrative visualization use parameters to control its state?
5. **[1 point]** Does the narrative visualization use parameters to control each scene?

* **Parameters.** What are the parameters of the narrative visualization? What are the states of the narrative visualization? How are the parameters used to define the state and each scene?

H. Triggers

1. **[2 points]** Does the essay indicate the triggers that connect user actions to changes of state in the narrative visualization?
2. **[1 point]** Does the essay indicate what affordances are provided to the user to communicate to them what options are available to them in the narrative visualization?
3. **[1 point]** Does the narrative visualization implement and respond to user events properly?
4. **[1 point]** Does the narrative visualization make any effort at all to communicate what options are available to the user?

* **Triggers.** What are the triggers that connect user actions to changes of state in the narrative visualization? What affordances are provided to the user to communicate to them what options are available to them in the narrative visualization?