Venturi Meter Experiment Simulation using JavaScript

Project Documentation and Test Cases.

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INTRODUCTION

The venturi meter experiment simulator is JavaScript version of Simulator written in java3D.

ABOUT THE EXPERIMENT:

The Venturi meter used in this experiment consists of successive converging, uniform and diverging sections equipped with pressure taps at selected locations. A Venturi meter is a device for determining the flow-rate of a fluid down a pipe. One measures the pressure difference between the venturi inlet and neck, and from this the flow-rate can be determined

LANGUAGES USED:

- HTML
- CSS
- JavaScript

Frameworks Used:

- Bootstrap: It is a CSS framework.

Libraries:

- jQuery: It is a JavaScript library.

OVERALL DESCRIPTION:

- Venturi meter: The heading of the experiment “Venturi meter” is at the top of the page.
- BODY: The body is bordered with dark blue color. Inside the body at the top there are Three Buttons that are:

1.Start: The start button is used to start the simulation.

2.Restart: The restart button is used to bring back the simulation to its initial state, and then again click “start” button to again start the Simulation.

3.Calculations: when the calculation button is clicked a modal will be displayed in which some values are to be entered(The values should be only positive integers less than 10,000) to get the coefficient Cd. After entering all the values click on the submit button then an alert will be displayed showing the value of coefficient Cd according to the

given values. Then click on close button to close the modal.

- Venturi Meter Pipe: After the buttons at the top a svg path is used to display the shape of Venturi meter pipe.

CODE REVIEW:

- For representing the Venturi meter I have used “<svg>” and the flow inside the venturi meter when clicked on start button is due to “<linearGradeint>” inside “<defs>” inside<svg>.As on clicking start button the Venturi meter path is added with style with attribute "fill:url(#progress)" where “progress” is the id given to the <linearGradeint>.And hence the

properties of linearGradeint are applied to venturi meter path.

- The two pipes are aligned vertically due to “transform:rotate(270deg);”.
- The progress in two vertical pipes is due to move () and move2() in “main.js”. In which an interval is set and the width of flow is increased vertically upwards.
- The dashed flow of lines inside the venturi meter when clicked on start button is set by “strokeDasharray=length+’ ’+length” and strokeDashOffset is set from 0 to length of the line and for the transition to happen the path.style.transition is set to

'stroke-dashoffset 12s ease-in-out' in the relative function of each line.

- When clicked on “calculations” button a modal is opened. In which each input field is validated that the value in each input field is a number that is the keycode is between 48 to 57 and there is no space that is the keycode is not equal to 31.

Test Cases:

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1. Area of measuring tank in cm2(a)=144
2. Height differences in pyrometer in cm(h)=40

3. Time to collect water for a height difference of h cm, measured in Seconds(t)=11
4. The area at inlet side in cm2=154
5. The area at throat in cm2=112
6. Head difference in the manometer, converted to cm of water (Hw)=30

After filling these input fields click on submit button then coefficient Cd is calculated and given an alert saying: “Coefficient Cd: 0.013226544255163493”

- If any field is left empty then an error is displayed saying “Please fill out this field”.