Vectors with Riverboat Simulation App User Guide

Welcome to the user guide for the Vector with Riverboat Simulation APP!

Step-by-step Guide

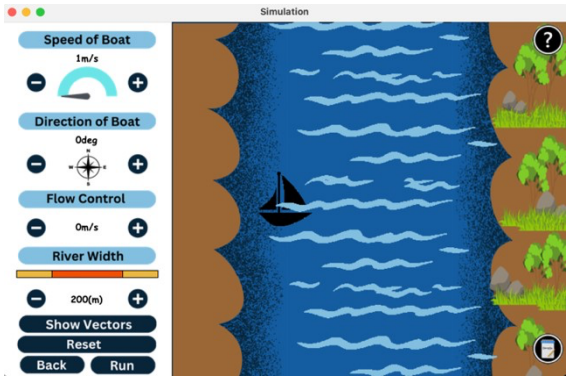
You would be guided step-by-step below on how to fully use the app:

1. Download and install the app

Whether you want to use Python 3.10.11 Idle or Visual Studio Code, download all the essential Python files to your own device. Prior to launching the app, make sure to install the Pillow program (https://www.geeksforgeeks.org/how-to-install-pil-on-windows/) and Fraction (https://pypi.org/project/Fraction/) by installing it via the command prompt. Launch the source code and then utilized the interface.

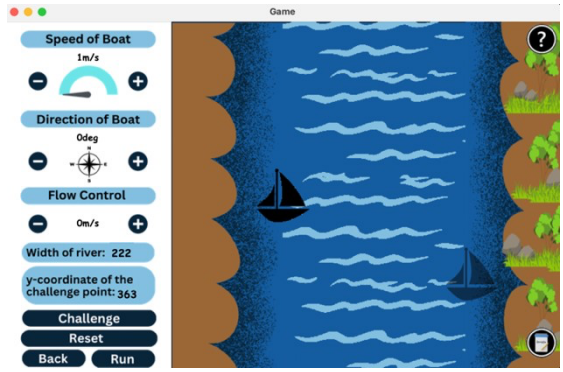
2. Home Page

Once the app is successfully installed, users can utilize three different buttons on the home page: simulation, start game, and equations. Click on the "Simulation" button to understand the basic values used to calculate the resultant speed, actual angle, and time. Click on the "Equations" button to proceed to the theory page which helps users to understand the basic theory as well as learn how to apply different equations. Lastly, users can click on the "Start game" button to proceed to the challenge page to test their understanding as the users need to do some calculations based on different values given to reach the challenge point.



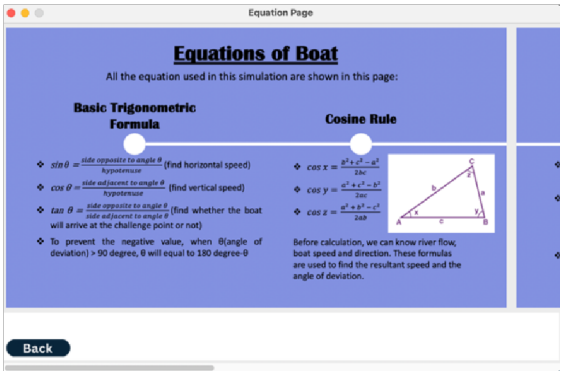
3. Simulation Page

The Simulation Page allows the user to input different values to stimulate a scenario of the process of a boat passing through the river. Users can make minor adjustments by using plusminus buttons and major adjustments by pressing the slider and dragging the mouse to left, right, up or down to input different values. By clicking on the "Run" button, an animation will be stimulated and the values for the resultant speed, actual angle, and time spent will be displayed. Users can click on the "Show/Hide Vectors" buttons to check or hide the vector of the boat. By clicking on the "Back" button, users will be led to the Home Page. The "?" button would lead the users to the Help Page. Users can click on the "bottom right-note book" button to know the steps of the calculation.



4. Start Game Page

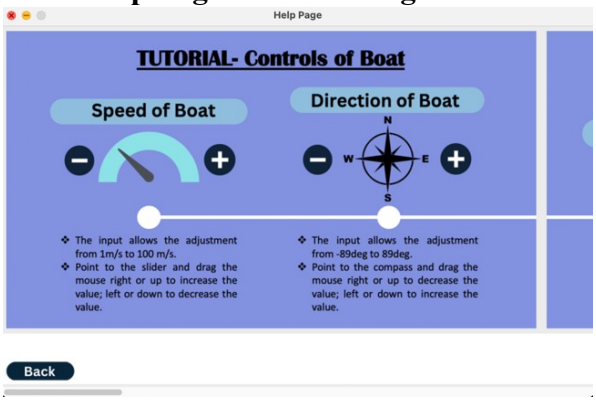
Click on the "Challenge" button to get the random number of the width of the river and the y-coordinate of the challenge point. Calculate and adjust all values using the plus-minus buttons or slider to reach the challenge point. After pressing the "Run" button, a message box will be shown to indicate whether the user succeed or failed in the game.

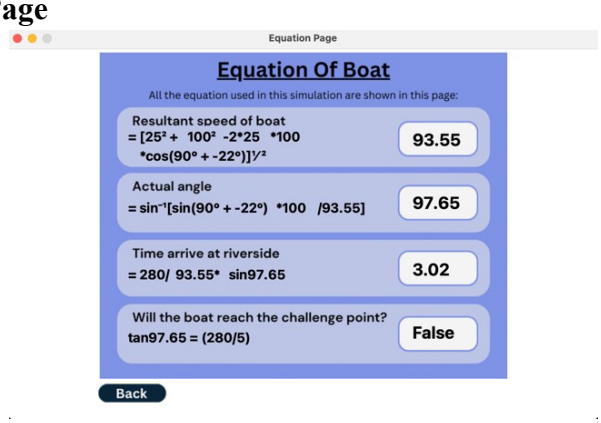


5. Equations Page

The Equations Page shows the theory and equations for the Basic Trigonometric Formula. Users can learn the theory of resultant speed, actual angle, and the time spent on vectors. By clicking on the "Back" button, users will be led to the Home Page.

6. Help Page & Bottom-right Notebook Page





Always refer to the Help Page if you encounter any problems while using the app as it contains answers to some of the Frequently Asked Questions and useful tutorials. The bottom-right notebook page allows users to know how different input values can be applied to the equations. Press the "Back" button to return to the 'Start Game' or 'Simulation' pages.

That is it. Enjoy and have fun!

Acknowledgment

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