

# iPaST

An application geared towards  
understanding Pascal's Triangle.

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# iPasT

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





Start Application



## The Landing Page

The landing page is what you see upon opening the application. To start generating your first Pascal's Triangle, enter the number of rows you desire to generate on the text field provided. Pressing the [Enter](#) key or clicking [Start Application](#) will take you to the canvas, where the triangle will be rendered.

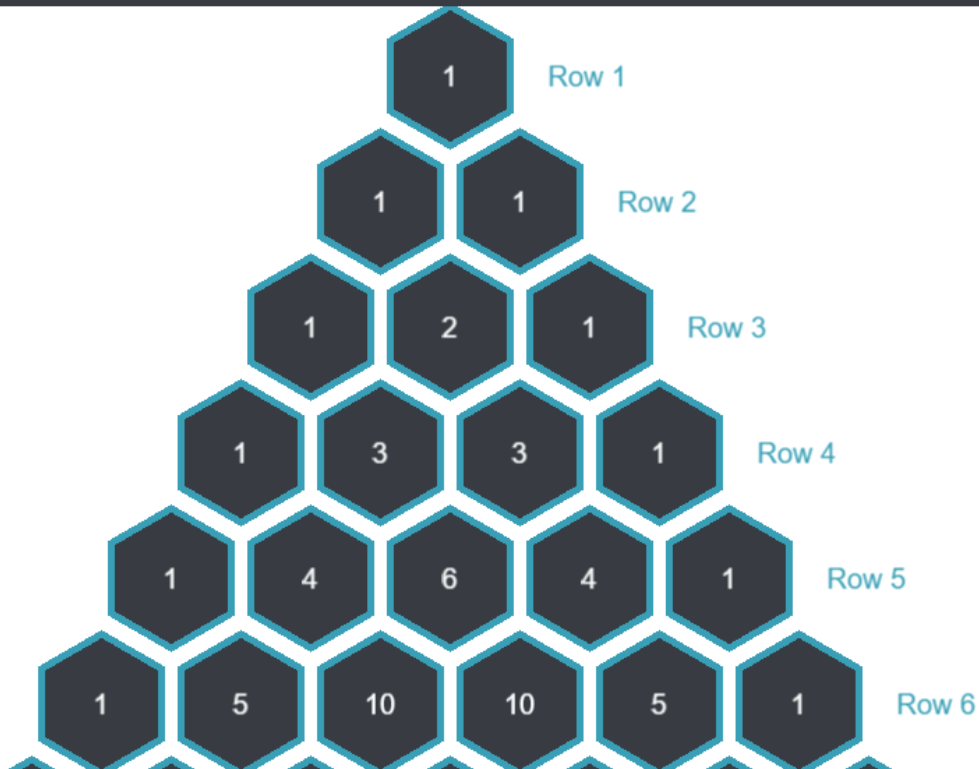
iPasT

(0, 0) 1.00x       

Generating a triangle with a large number of rows takes a relatively longer time to render, in which case you will see this screen.

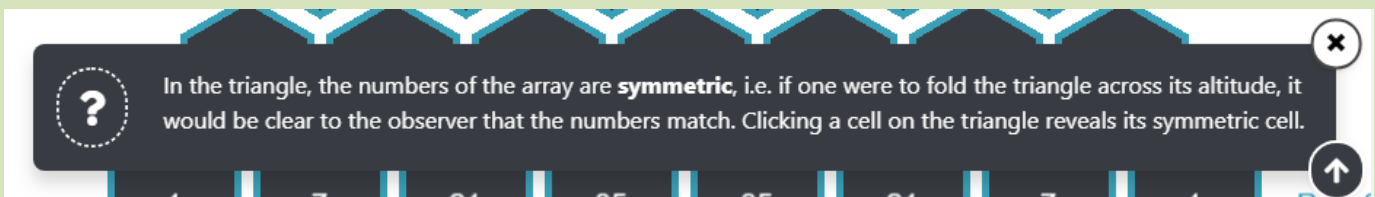
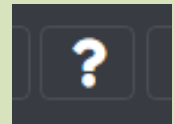


Generating...



## The Application Proper

A generated triangle will look like the one shown in the figure above. The default *mystery* shown is the symmetry property. Clicking the question mark icon (see figure on the right) near the top right corner will prompt the appearance of a field explaining the mystery. In this example, clicking the question mark icon will result to having this at the bottom of the screen:

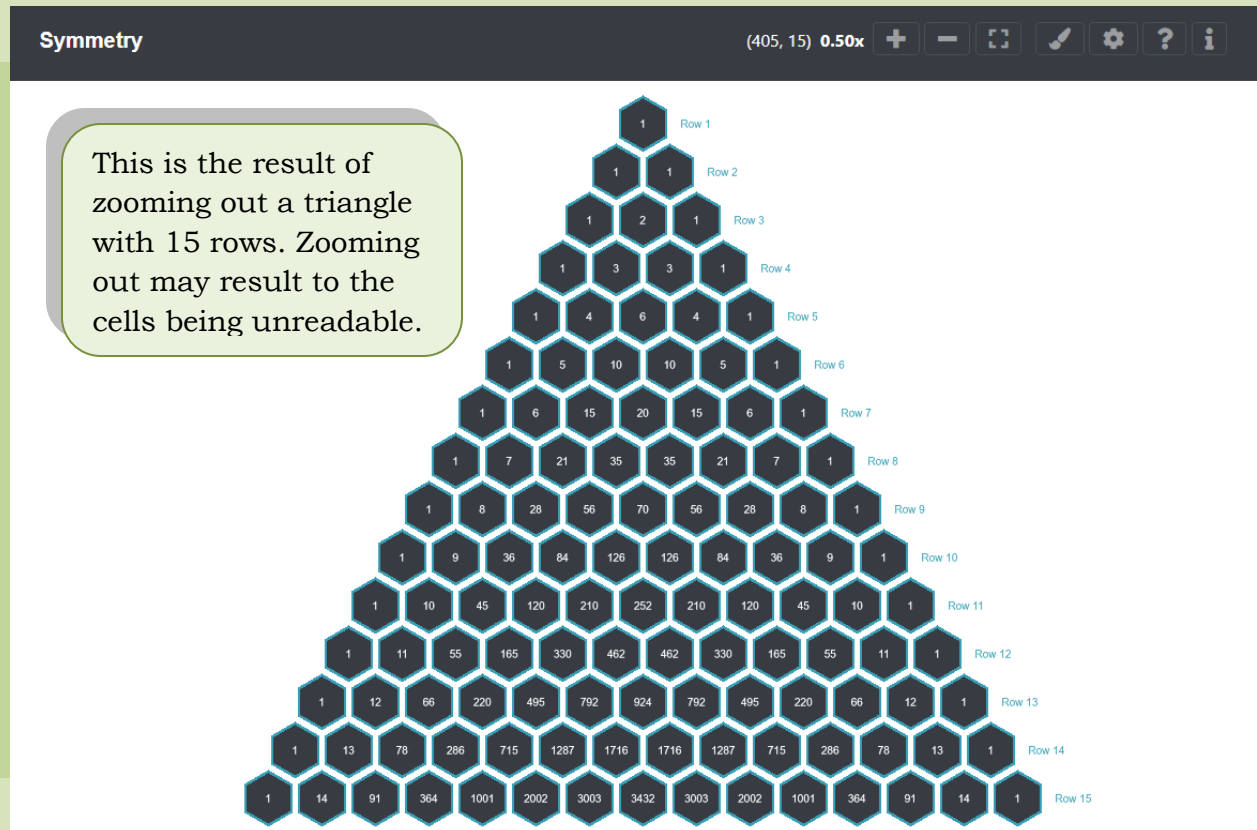


There are a number of things the user can do in the application proper:

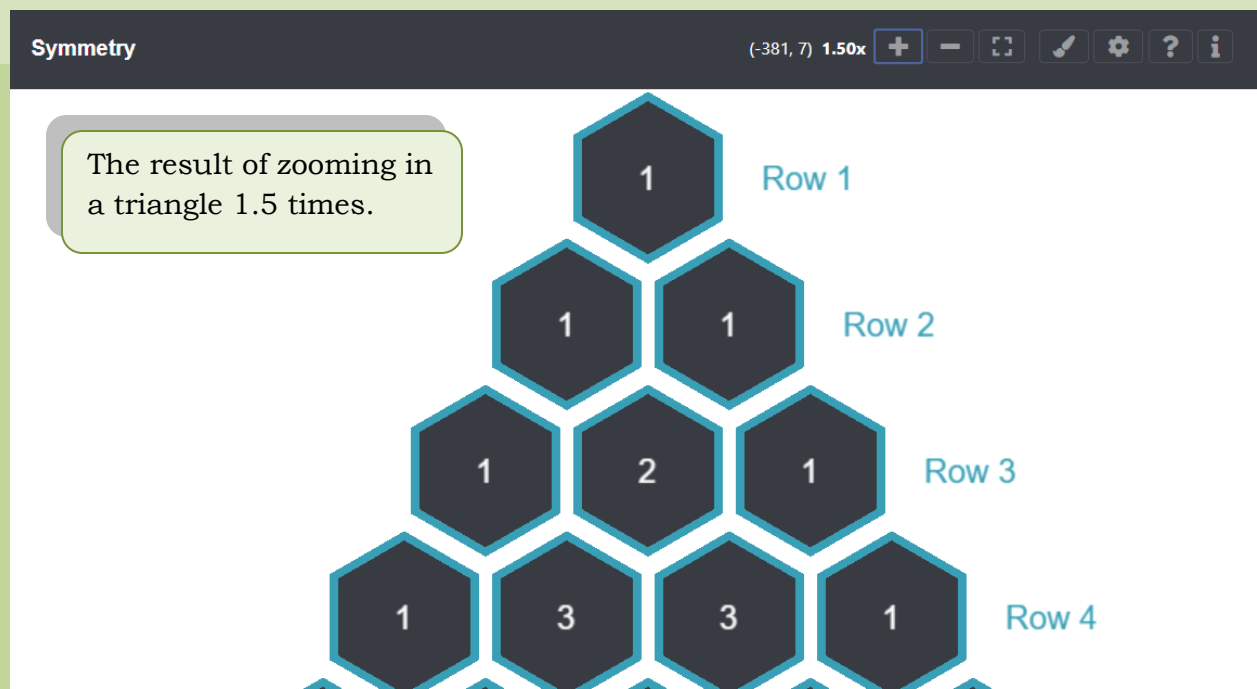
- 1 | Zoom In and Out
- 2 | Drag and Reposition
- 3 | Change Cell Properties
- 4 | Change Mystery
- 5 | Generate a New Triangle

## 1 | Zoom In and Out

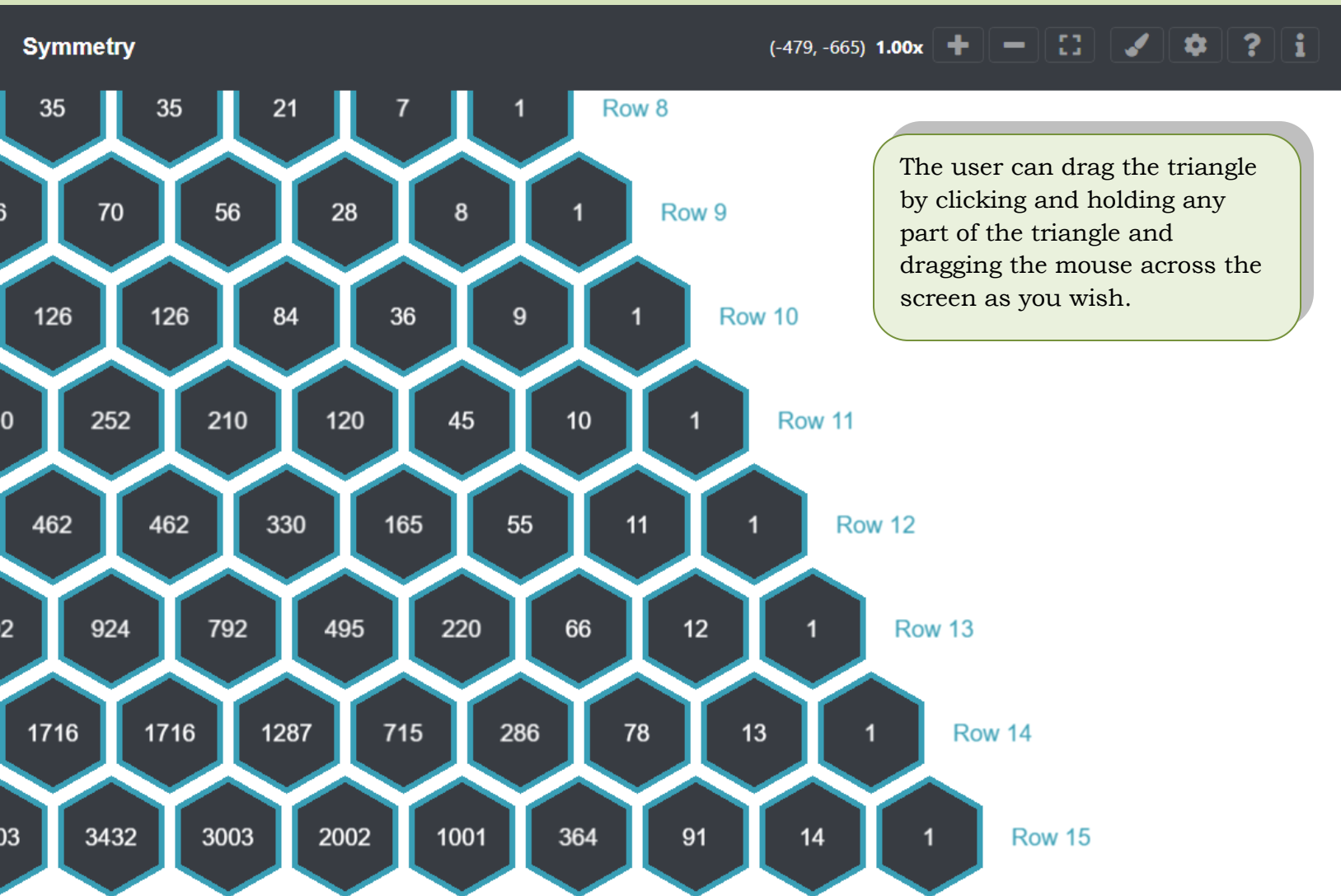
In most cases, the triangle will be too big to fit the user's screen. In order to see the whole triangle, the user may zoom out by clicking the minus icon.



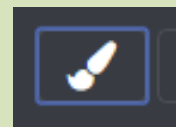
Likewise, the user can also zoom in when the cells are too small to read. This is done by clicking the plus icon.



## 2 | Drag and Reposition



To reposition the triangle means to return it to its original position, with the very first cell of the very first row at the top center of the screen. To do this, click the paintbrush icon (as seen on the right) and click the [Reset Position](#) button at the bottom of the menu.



Cell Size: 100 Font Size: 20 Change Sizes

Fill: #343a40 Text: #ffffff Stroke: #17a2b8 Select: #007bff Highlight: #28a745 Disabled: #6c757d

Apply Colors **Reset Position** Reset Zoom ☒ Show Row Labels

### 3 | Change Cell Properties

Various cell properties can be changed, including cell size, font size, and cell colors. This can be done by clicking the paintbrush icon (as shown in the previous page). A menu will be shown (see figure below), and the user is free to change the values in all fields as they wish. Note that the user must click [Change Sizes](#) or [Apply Colors](#) in order for the changes to be seen.

The screenshot shows the 'Symmetry' settings panel. At the top, there's a title 'Symmetry' and a status bar with coordinates '(-479, -665)', zoom '1.00x', and icons for zoom in, zoom out, reset, paintbrush, settings, help, and info. Below the status bar, there are two input fields: 'Cell Size' with the value '100' and 'Font Size' with the value '20'. To the right of these fields is a 'Change Sizes' button. Below the input fields, there are six color selection boxes: 'Fill' with '#343a40', 'Text' with '#ffffff', 'Stroke' with '#17a2b8', 'Select' with '#007bff', 'Highlight' with '#28a745', and 'Disabled' with '#6c757d'. At the bottom of the panel, there are three buttons: 'Apply Colors', 'Reset Position', and 'Reset Zoom', followed by a checkbox labeled 'Show Row Labels' which is currently checked.

### 4 | Change Mystery

The *mysteries* are the bulk of the iPaST application. Each *mystery* pertains to a certain property or characteristic that the Pascal's Triangle intrinsically contains. To see all available *mysteries*, click the gear icon (see the image to the right). A drop down *mystery* menu will be shown. The initial *mystery* upon loading the program is the symmetry property.



The screenshot shows the 'Symmetry' settings panel with the 'Mystery' dropdown menu open. The dropdown menu lists several options: 'Symmetry' (selected), 'Powers of 2', 'Powers of 11', 'Divisibility By Prime', 'Counting Numbers', 'Triangular Numbers', 'Tetrahedral Numbers', 'Hockey Stick Pattern', 'Fibonacci Numbers', 'Combinatorics', and 'Modular Arithmetic'. To the right of the dropdown menu, there is a 'Triangle Height' input field with the value '15' and an 'Apply' button. Below the input field, there is a partial view of a Pascal's Triangle with rows labeled 'Row 8', 'Row 9', and 'Row 10'. A callout box on the right side of the image contains the text: 'Once the user has chosen a mystery, he or she must click [Apply](#), otherwise the mystery will not be loaded.'

## 5 | Generate a New Triangle

When the user wants to change the triangle's number of rows, he or she must generate a new triangle. To do this, click the gear icon (as shown in the previous page) and enter the new number of rows in the field labeled **Triangle Height**. The user must then click **Apply**, otherwise the change will not happen.

Symmetry

(-479, -665) 1.00x

Mystery

Symmetry

Triangle Height

15

Apply