MANDELBROT SET FRACTAL IMAGE VIEWER

The program allows a user to view a graphical representation of a portion of the complex plane such that those numbers which are members of the Mandelbrot set are visually differentiated from those that are not.

1. **Main Window**
   A. **The program opens with the window shown in Figure 1.**

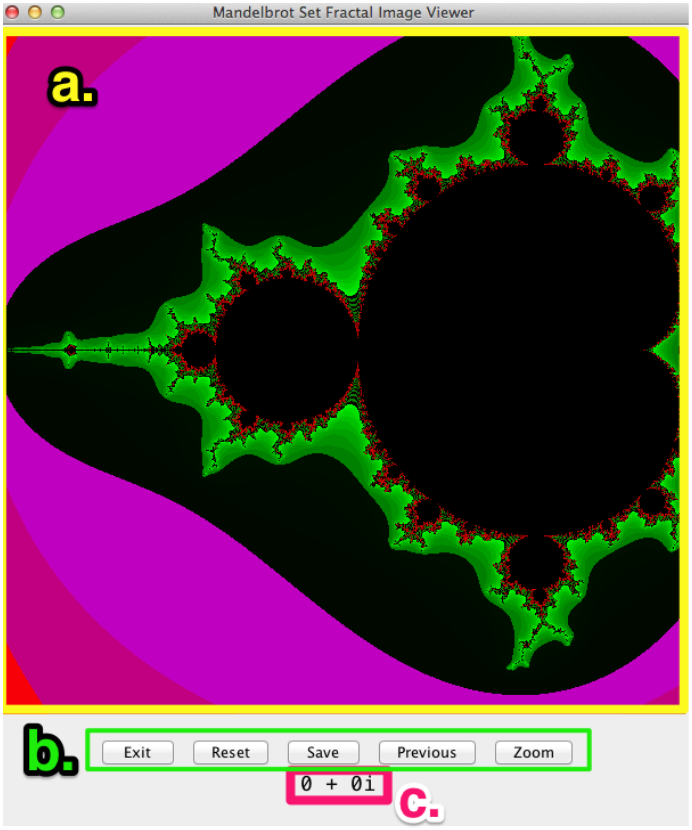

Figure 1

   B. **The labeled areas of the main window are**
      a. ***The image area***
      This area displays a portion of the complex plane. Each pixel represents a specific complex value. Those pixels that are colored black represent complex numbers that are in the Mandelbrot set. See paragraph 2 for further information.
      b. ***The control area***
      This area has buttons to control the program or the image view. See paragraph 3 for details.

c. ***The information area***
This area displays the value of the complex number at the pixel directly under the mouse's position, if the mouse pointer is over the image.

2. **Image Area**
   a. **Clicking on any portion of the image will move the view in the image area. The image will then be centered on the area that was under the pointer at the time of the click. To view a portion of the complex plane that is not currently displayed, repeatedly click in a direction. For example, to view complex values to the right of what is currently displayed, repeatedly click on the right side of the image until those values of interest are displayed.**
3. **Control Area**

Figure 2

The buttons in the control area do the following (see Figure 2):

a. ***Exit***
Selecting this button will cause the program to exit.
b. ***Reset***
Selecting this button will cause the view in the image area to return to the initial value on startup.
c. ***Save***
Selecting this button will allow the currently displayed view in the image area to be saved to the file system as a bitmap file.
d. ***Previous***
Selecting this button will cause the currently displayed view in the image area to revert to the displayed view just before the latest change, reverting either a move (via mouse click) or a zoom.
e. ***Zoom***
Selecting this button will cause the currently displayed view to show a smaller portion of the complex plane. This has the effect of zooming the view.