CSE 015: Discrete Mathematics
Laboratory #6
Report

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Experiments

1. **Experiment 1:**

   (a)
   - NUMITERS = 25
   - XMIN = -2
   - XMAX = 2
   - YMIN = -2
   - YMAX = 2

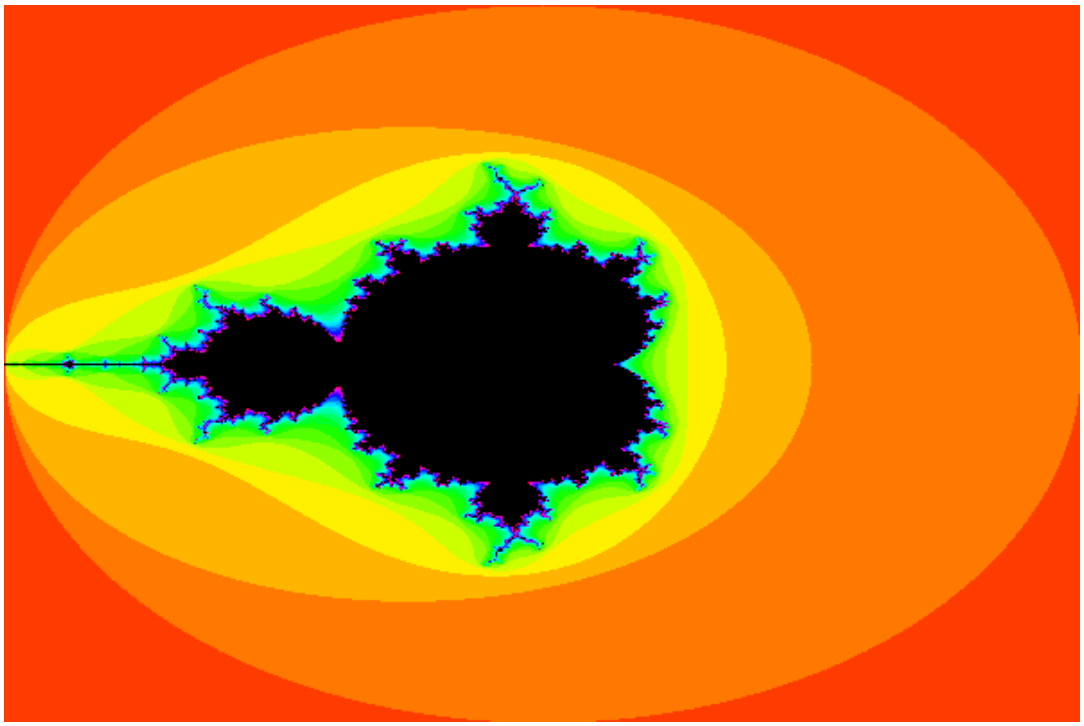

Figure 1: Figure's name

(b)

(c) some observations here: The figure looks like the game called agar.io where the user tries to eat others' users cells where you control a cell to eat other cells and gain mass by eating food. It looks like when a big cell split up into smaller cells, and it is trying to get back together into one cell. It also looks like it is from a microscope, because certain cells from an organism look quite like this without regard for the colors.

2. **Experiment 2:**

(a) You provide the parameters here.

- NUMITERS = 50
- XMIN = -1
- XMAX = 5
- YMIN = -5
- YMAX = 10

(b) You provide the plot in eps format that corresponds to the parameters above.

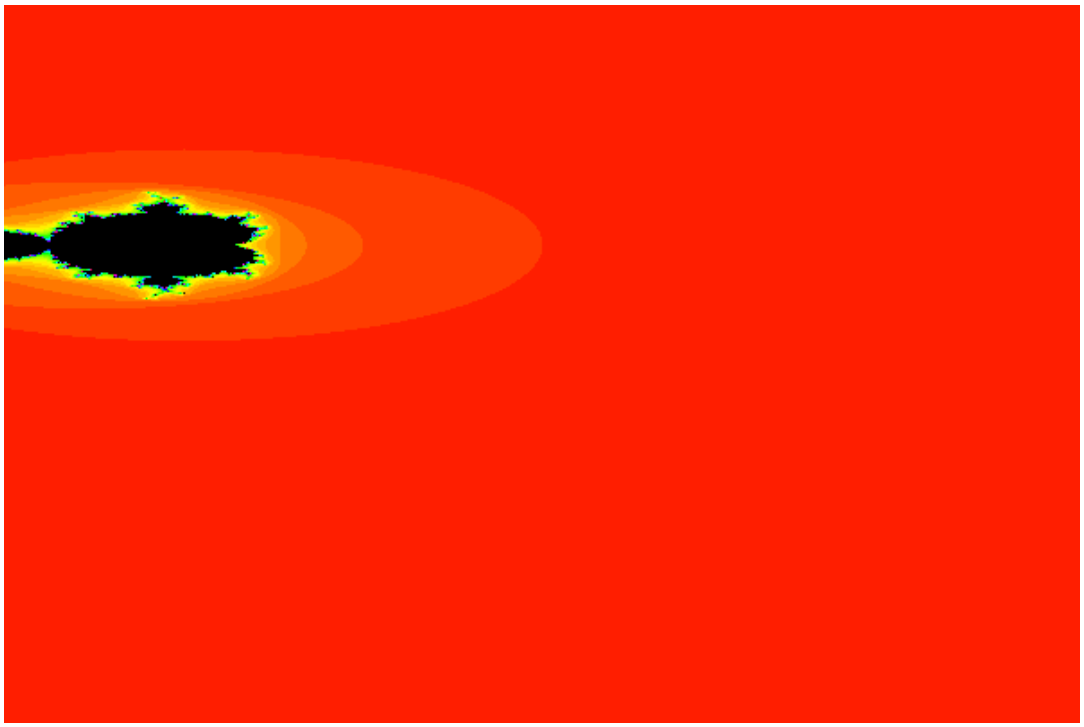

Figure 2: Figure's name

(c) some observations here - It looks as though the image is taken up mostly with the red coloring, and the image is more flattened with the increased y values in height, and the figure in black is much smaller compared to the first experiment. It still has the aura of different colors, but it is less since it has a higher NUMITERS. The small object in black is on the left and does not take up the entire image because of the fact that it is mostly in the values of -2 to 2 in x and XMAX going to 5 results in more red heading out to the right end of the picture.

Conclusion

Describe your observations here.

1. How does the plot change when the MAXITERS parameter is changed? - The plot changes in that for the increase with the MAXITERS, it seems as though the colors are pushed closer into the figure in that there is much more red covering the image compared to the varying colors shown on the original plot with the figure in black. So it is like the aura with multiple colors of the figure from 1a has a more contained aura when increasing the MAXITERS such that the multiple colors take up less space and are taken up more by the color of red.

2. How does the plot change when the XMIN, YMIN, XMAX, YMAX parameters are changed? - When those XMIN, YMIN, XMAX, YMAX parameters are changed, we see that when the parameters are changed, the image stays the same size, but the dimensions change accordingly. Dimensions increase when the XMAX and YMAX parameters increase and XMIN and YMIN parameters decrease, and vice versa when decreasing the dimensions (XMAX and YMAX parameters decrease and XMIN and YMIN parameters increase).

3. What is the range (x, y) of the Mandelbrot set, i.e., in what region on the coordinate plane is it located? - The range of x and y of the Mandelbrot is from x = -2 to 1 and y = -1 to 1. This is the image of 1a.

4. Find the parameters to reproduce the Figure 1b. - Parameters: NUMITERS = 1000, XMIN = -2, XMAX = 1, YMIN = -1, and YMAX = 1.