HPC: Homework 1

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Problem 1

(1) Command used:

```
vim dataset_HS.txt
```

Then I typed the numbers into rows.

(2a) Command:

```
awk '{print $5}' dataset_HS.txt
```

(2b) Command:

```
awk '{print $5*50}' dataset_HS.txt
```

(2c) Command:

```
awk '{if(NR > 2) print $0 }' datatest_HS.txt > datatest2_HS.txt
```

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(3) Command:

```
grep 'CPUtime - begin time' HPC1_Model1B.txt | \
sed -E 's/count = ([0-9]*).*CPUtime - begin time\) = \
([0-9]*\.[0-9,e,\+,-]*).*/\1 \2/'
```

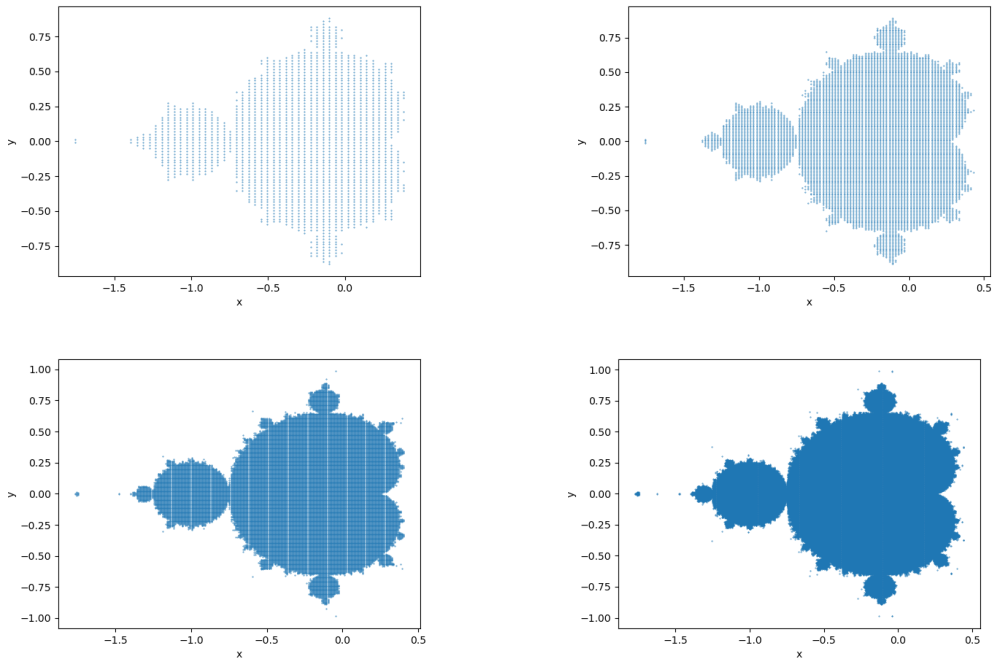

Figure 1: Estimates of the Mandelbrot set with 100, 200, 400, and 800 grid points along each axis. We see that the boundary of the Mandelbrot set gains more structure as the grid becomes finer.

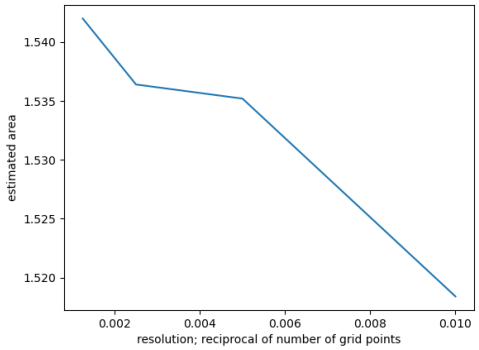

Figure 2: Estimate of area of the Mandelbrot set as a function of the grid resolution. We see that the area is roughly related linearly to the resolution as far as we can tell at this scale, and that the area is 1.50 as the resolution goes to 0.

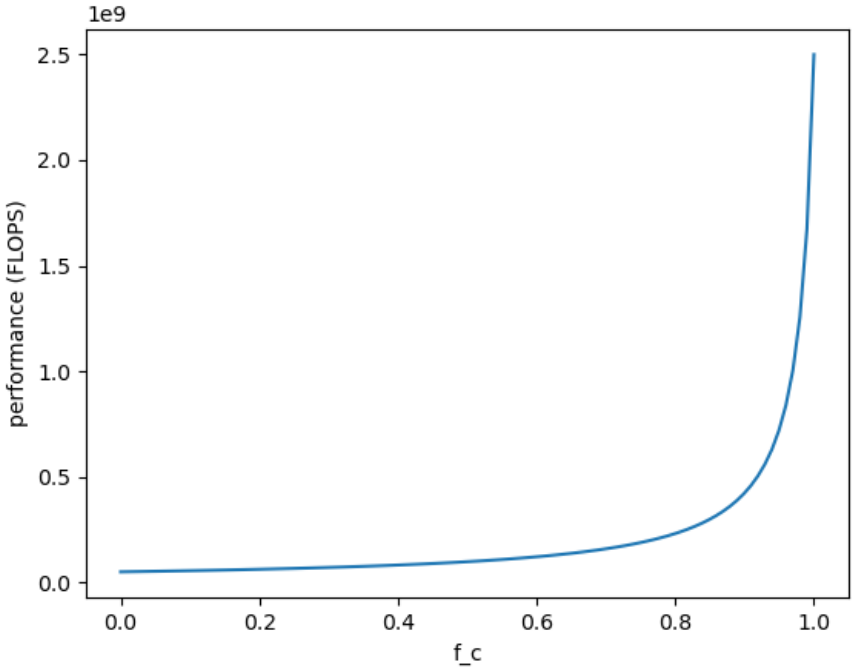

Figure 3: Performance in FLOPS for varying cache hit rates