

Analytic Combinatorics Program V.1

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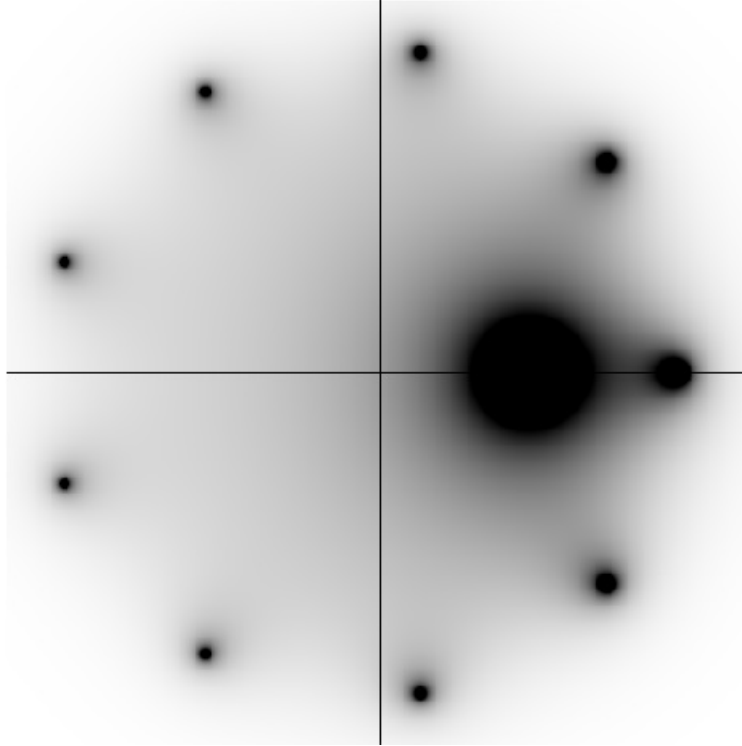
I wrote the following code to plot the generating functions. The variables spz and sqz are the generating functions $S_p(z)$ and $S_q(z)$ where $p = 0000000001$ and $q = 0101010101$.

```
public class BitStringPlot implements ComplexFunction {
    public Complex eval(Complex z) {
        final int maxPower = 11;
        Complex[] powersOfZ = new Complex[maxPower];
        powersOfZ[0] = new Complex(1, 0);
        for (int i = 1; i < maxPower; i++) {
            powersOfZ[i] = powersOfZ[i - 1].times(z);
        }
        Complex spz = ((powersOfZ[10].minus(z.times(2))).plus(powersOfZ[0]))
            .reciprocal();
        Complex sqzNum = powersOfZ[0].plus(powersOfZ[2]).plus(powersOfZ[4])
            .plus(powersOfZ[6]).plus(powersOfZ[8]);
        Complex sqzDenom = powersOfZ[10]
            .plus((powersOfZ[0].minus(z.times(2))).times(sqzNum));
        Complex sqz = sqzNum.divides(sqzDenom);
        return spz;
        // return sqz;
    }

    public static void main(String[] args) {
        Plot2Dez.show(new BitStringPlot(), 512);
    }
}
```

This resulted in the following plots, shown on the next page.

Here is the plot of $S_p(z)$:



Here is the plot of $S_q(z)$:

