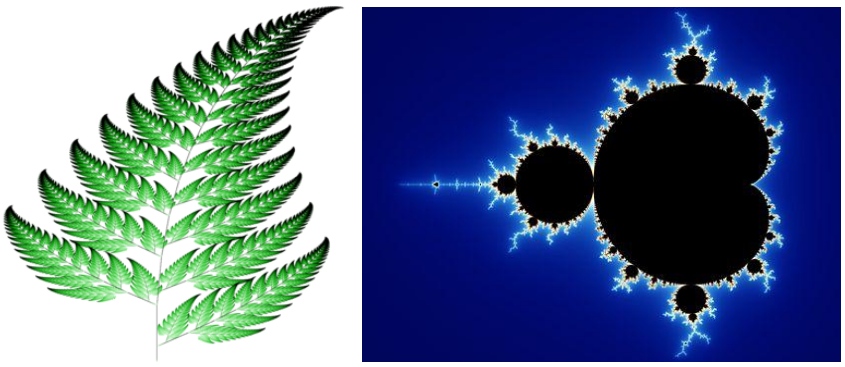
Requirement analysis

The goal of this project is to create a software that is able to generate nice-looking images about various fractals (Fern, Mandelbrot), with different resolutions and zoom (See Figure 1.). Later, these images can be used as eye-pleasing wallpapers.

What is a *fractal*? “A fractal is a never-ending pattern. Fractals are infinitely complex patterns that are self-similar across different scales. They are created by repeating a simple process over and over in an ongoing feedback loop.” [1]

Barnsley fern: This fractal was named after the british mathematician *Michael Barnsley*, who was the first one to describe it. He created it in such a way to be similar to the black spleenwort.



Left: “Barnsley fern” fractal [2]. Right: Mandelbrot set (black) [3].

Mandelbrot set: This is probably the most famous fractal. It was named after the mathematician *Benoit Mandelbrot*, in honour of his major contribution to the evolution of fractal geometry.

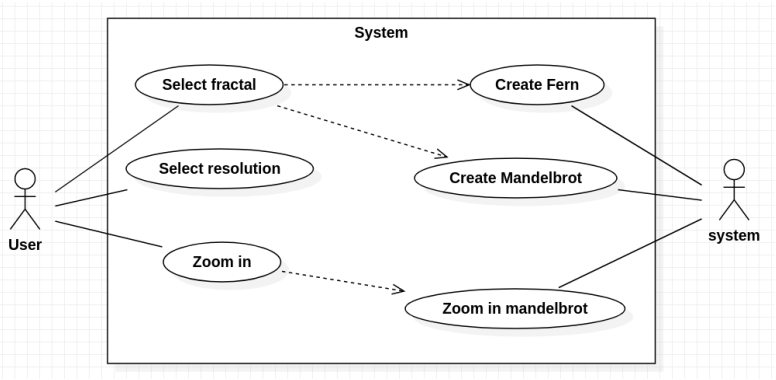


Figure 1.: Use case diagram of the project. It is required that the user be able to select the desired fractal, it’s resolution. The system will create the fractal based on the information provided by the user. The user will also be able to zoom into the mandelbrot fractal. The system will produce the zoomed in picture on request.

Resources:

[1]: Fractal Foundation, webpage: https://fractalfoundation.org/resources/what-are-fractals/
[2]: Barnsley fern, Wikipedia: https://en.wikipedia.org/wiki/Fractal
[3]: Mandelbrot set, Wikipedia: https://en.wikipedia.org/wiki/Mandelbrot_set