# Glossary

**Algorithms** The underlying evolutionary principle of the survival of the fittest is applied to an algorithm in order to create a solution to the proposed problem. Based on the first iteration: "some of the better candidates are chosen to seed the next generation by applying a recombination and/or mutation to them. Recombination is an operator applied to two or more selected candidates (the so-called parents) and results one or more new candidates (the children). Mutation is applied to one candidate and results in one new candidate. Executing recombination and mutation leads to a set of new candidates (the offspring) that compete—based on their fitness (and possibly age)—with the old ones for a place in the next generation," (Eiben and Smith 2003, p. 15).

**Arrays** Arrays are special variables that can contain more than one value. The index inside of square brackets for the array indicates which value is being used. `variableName[0]` is the first value, `variableName[1]` is the second value, etc.

**Big data** Most simply, big data is a collection of very large amounts of information that might include a variety of media such as text, images, video, and metadata (data about the data, such as the location and time it was collected). More formally, though still vaguely, big data has been defined in terms of its three "Vs": "Volume – large amounts of data 2. Variety – the data comes in different forms including traditional databases, images, documents, and complex records 3. Velocity – the content of the data is constantly changing, through



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the absorption of complementary data collections, and from streamed data arriving from multiple sources" (Berman 2013, p. xx).

**Data visualization** Attempting to understand data by placing it in a visual context. Historically this process has focused on charts and graphs, but may include any type of visual element. Programs such as Microsoft Excel and Tableau are frequently used for creating such visualizations.

**For loop** A for loop is a procedure that facilitates iteration by looping through the code that is contained in it multiple times. Variables in the opening line of the loop tell it how many times to run. In this case, it starts at 0 (`i=0`) and runs until `i` is equal to `rowCount`, which has been previously defined as the number of rows of data in the CSV file. `i` is increased by one (`i++`) each time the loop runs through one iteration.

**Generative design** A type of design approach that is based on the combination of repetition and variation.

**Information aesthetics** An approach developed by Lev Manovich (2001) that studies aesthetic approaches in context of the larger cultural forms that are specific to the contemporary information society.

**Iteration** A form of repetition, used here in the context of computer code. This can be created using a variety of approaches such as loops, addressed later.

**Media studies** The academic study of the history, content, and effects of media.

**Modulation** Modulation is a change or variation, and works particularly well in combination with repetition. For example, the lines in Image 1 were created by varying, or modulating, their location on the screen using a simple algebraic algorithm that alters each line's location slightly.

**Parameterization** A parameter is a value that sets the conditions of an operation and impacts the output. For example, the budget for a project is a parameter that places constraints on the possibilities for design. Reas and McWilliams (2010) explain this in relation to code: "Thinking about parameters provides a bridge between repetition and transformation… While transformation describes a parameter's effect on form, repetition offers a way to explore a field of possible designs for favorable variations," (p. 95).

**Repetition** Coding is particularly well-suited for repetition, or the repeating of particular design elements such as lines, text, images, or

sounds, because these repetitions can be created with only a few lines of code as part of a "for loop" (see below). Repetitions can create a sense of rhythm, depth, and/or motion depending on how they are used (Reas and McWilliams 2010). Image 1 Generative Design in this text is an example of the repetition of lines.

**Transformation** Transformation is, most simply, the moving of an object, but when done digitally can include shearing, stretching, reflecting, warping, and distorting (Reas and McWilliams 2010). Such transformation can be used in computer graphics and animation to create movement.

**Variables** Variables are named placeholders that can hold any value, much like the variables you may be familiar with from algebra. For example, x can be a variable that is assigned a numerical value. It can also be set to contain a string, which is a series of numbers and letters. Numeric variables can be used in calculations, while those containing strings cannot.

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