Here is a very short explanation of some of the symbols used in Chapter 2 of Eiben and Smith's book "*Introduction to Evolutionary Computing*". Courtesy of Maarten Lamers of the Media Technology MSc program, Leiden University.

ε	A symbol that is commonly used to denote some a-specific (very) small positive value. For example, $x = 1/(4+\varepsilon)$ means that x is slightly smaller than 1/4, such as 1/4.0001. Actually, the typographic symbol used by Eiben and Smith is not exactly the same, but Microsoft Word does not support it.
Δ	A symbol that represents a change. For example Δw represents a change in value w.
$\sum_{i=a}^{b}$	Summation over values $i \in a \ldots b$. For example, if $a = 2$ and $b = 4$ then $\sum_{i=a}^{b}(i \cdot 2) = \sum_{i=2}^{4}(i \cdot 2) = (2 \cdot 2) + (3 \cdot 2) + (4 \cdot 2) = 18$.
$n!$	The faculty operator. For example, $5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$.
$A \Rightarrow B$	B follows from A. This means that if statement A is true, then statement B is also true. For example, we know that $x \le 5 \Rightarrow x < 9$.
$\{\ldots\}$	Represents a set, which is a collection of distinct items. For example, $P = \{1,2,\cdots,9\}$ means that P is a set containing each of the integer numbers 1 through 9.

In the examples below, assume that set $P = \{1,2,\cdots,9\}$.

$p \in P$	Means that p is a member of set P. Given our example set P, p can be any of the integer values 1 through 9.
$\{\ldots \mid \ldots\}$	Means *such that*. For example, $Q = \{q(p) \mid p \in P\}$ means that Q is the "set of all values $q(p)$ such that $p \in P$", or $Q = \{q(p) \mid p \in P\} = \{q(1), q(2), \cdots, q(9)\}$. Another example: if N is the set of all natural numbers (integers) then, $\{2 \cdot x \mid x \in N\}$ is the set of all even natural numbers.
$P \setminus G$	Set exclusion. For two sets P and G, $P \setminus G$ is the set containing all elements of P that are not in G. For example, if $G = \{3,4,\cdots,99\}$ then $P \setminus G = \{1,2,\cdots,9\} \setminus \{3,4,\cdots,99\} = \{1,2\}$.
$(0,1)$	All possible real values between 0 and 1, *excluding* 0 and *excluding* 1.
$[0,1)$	All possible real values between 0 and 1, *including* 0 but *excluding* 1.
$(0,1]$	All possible real values between 0 and 1, *excluding* 0 and *including* 1.
$[0,1]$	All possible real values between 0 and 1, *including* 0 and *including* 1.