Pattern of the Strings of the *n*-th Order Limit Language

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Abstract. The splicing system is a study that associate with formal language theory in Mathematics and informational macromolecule in Biology. In addition, the splicing system is modelled based on the biological process where DNA can be cut into fragments and later can be pasted to form the same or new DNA. The splicing system model comprises of important components such as alphabets, strings, and rules. Previously, the formation and the properties of a type of splicing language which is the extension of limit language known as *n*-th order limit language was presented. Its formation is depending on the rules in the splicing system given that each rule must be equal in term of length despite the initial strings. Therefore, the study is aimed to find out the pattern of the string when finite initial strings is considered and its relation to the *n*-th order limit language.

INTRODUCTION

Head in 1987 [1] laid a framework about the mathematical modelling of splicing system that involve the biological process of cut and paste of double-stranded deoxyribonucleic acid (dsDNA) with aid from restriction enzyme and other chemical substances. Its existence makes the important information such as biological instructions can be passed from the one cell to another [2]. The component of DNA [3] is given as follows.
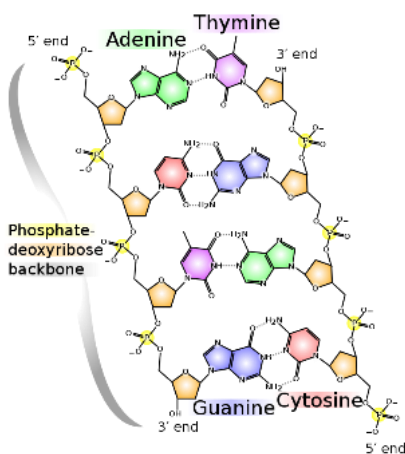

FIGURE 1. The Component of DNA

Based on Watson-Crick complementarity, A is paired with T meanwhile C is paired with G, and vice versa [4]. The pairs are presented as *a, c, g,* and *t,* respectively. Restriction endonuclease or restriction enzyme can halve the DNA at its restriction site. [5].