Proceedings of the 42nd Hawaii International Conference on System Sciences - 2009

Forming Social Networks of Trust to Incentivize Cooperation

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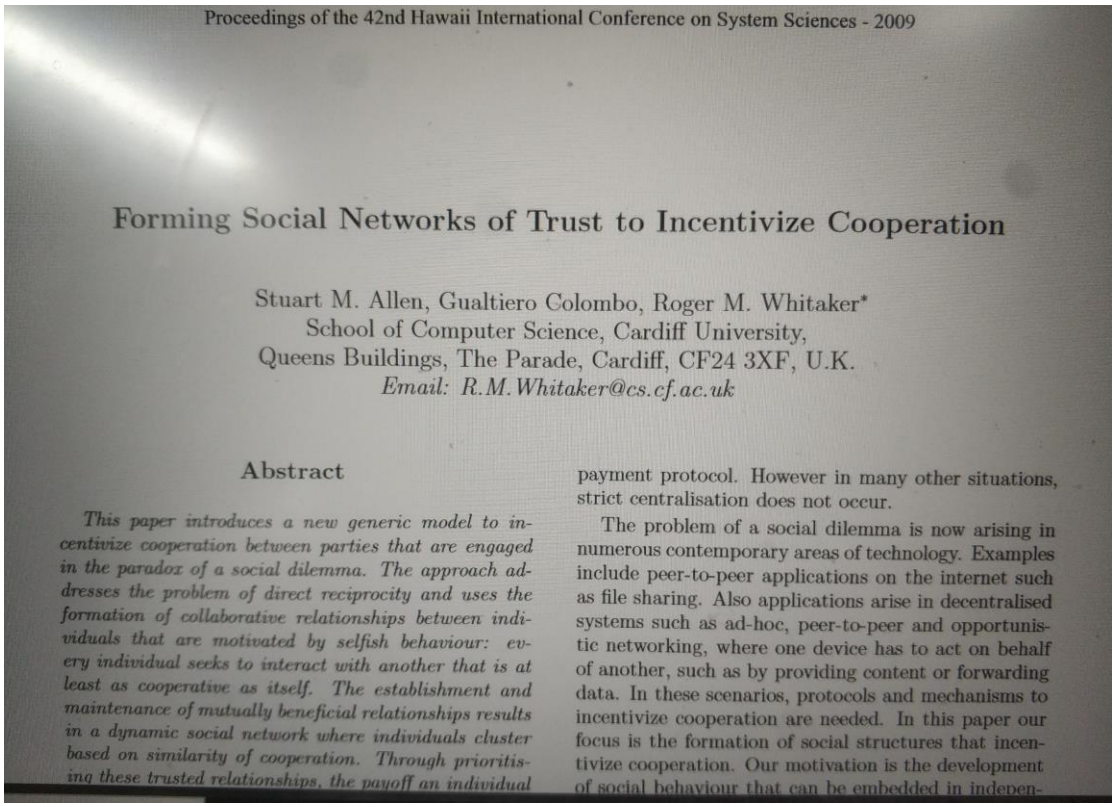

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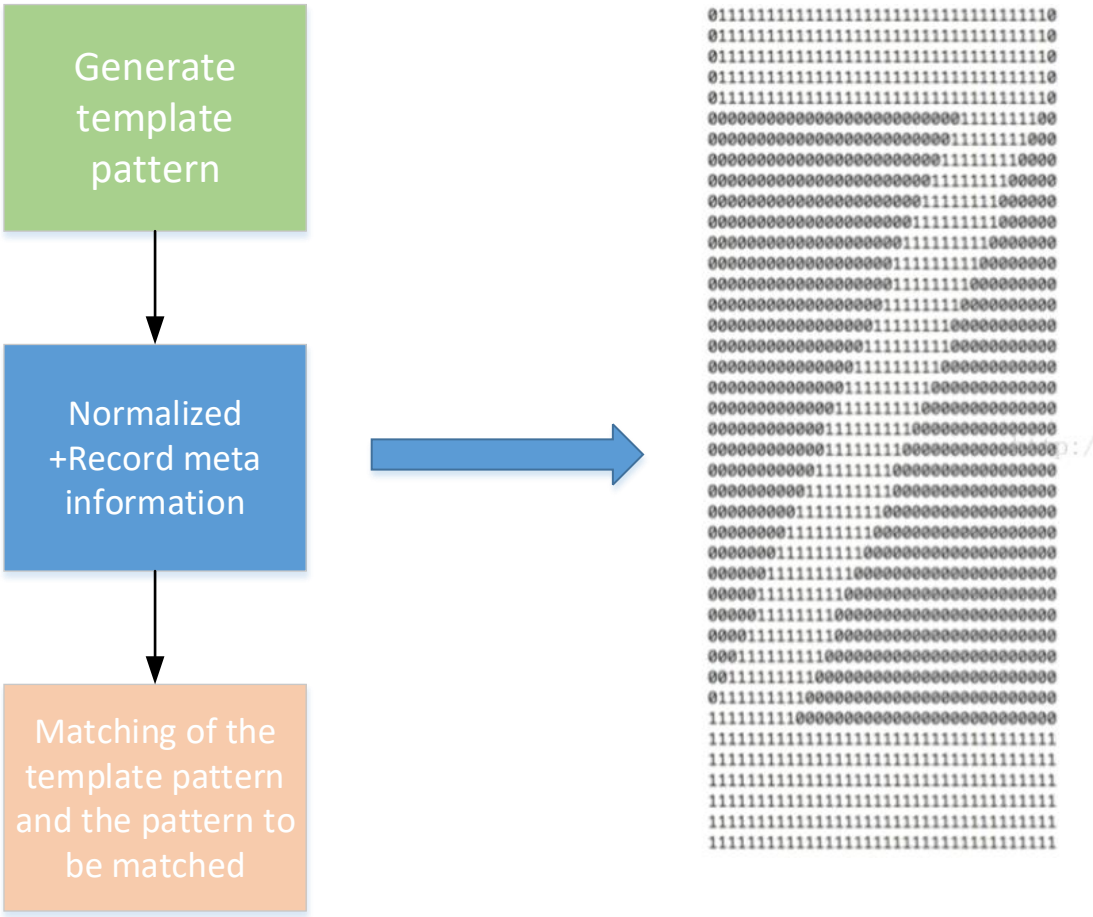
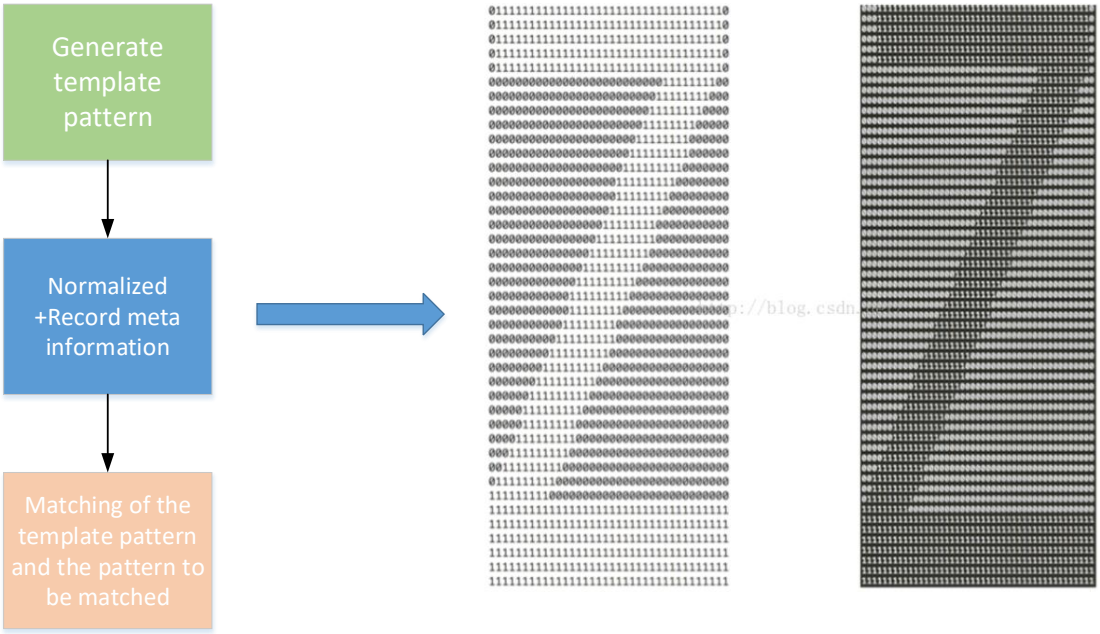
Abstract

This paper introduces a new generic model to incentivize cooperation between parties that are engaged in the paradox of a social dilemma. The approach addresses the problem of direct reciprocity and uses the formation of collaborative relationships between individuals that are motivated by selfish behaviour: every individual seeks to interact with another that is at least as cooperative as itself. The establishment and maintenance of mutually beneficial relationships results in a dynamic social network where individuals cluster based on similarity of cooperation. Through prioritising these trusted relationships, the payoff an individual

payment protocol. However in many other situations, strict centralisation does not occur.

The problem of a social dilemma is now arising in numerous contemporary areas of technology. Examples include peer-to-peer applications on the internet such as file sharing. Also applications arise in decentralised systems such as ad-hoc, peer-to-peer and opportunistic networking, where one device has to act on behalf of another, such as by providing content or forwarding data. In these scenarios, protocols and mechanisms to incentivize cooperation are needed. In this paper our focus is the formation of social structures that incentivize cooperation. Our motivation is the development of social behaviour that can be embedded in indepen-

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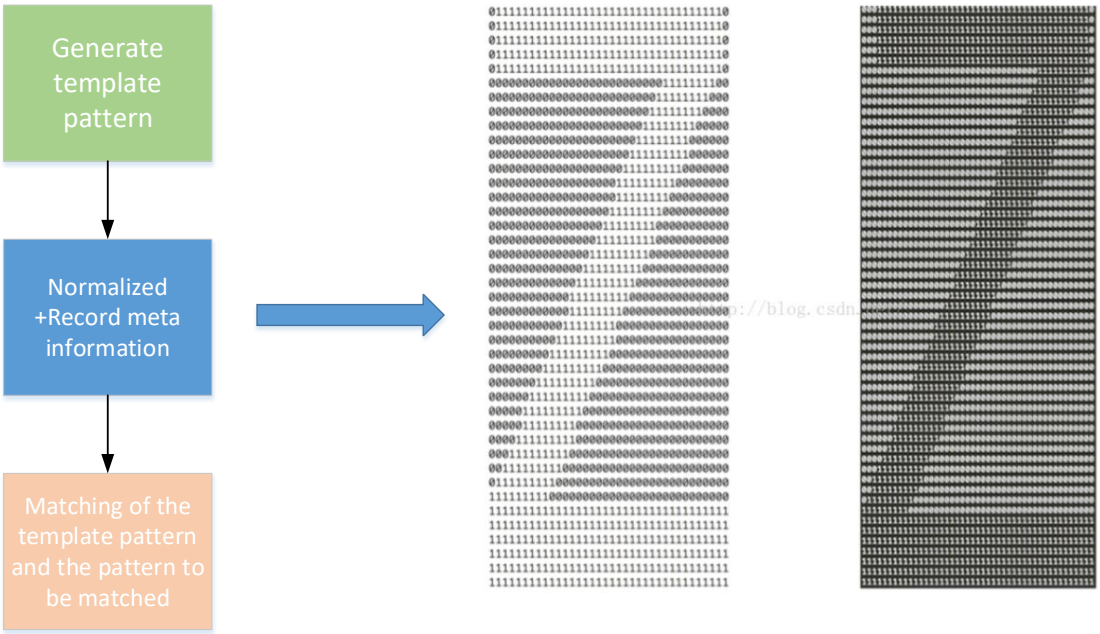
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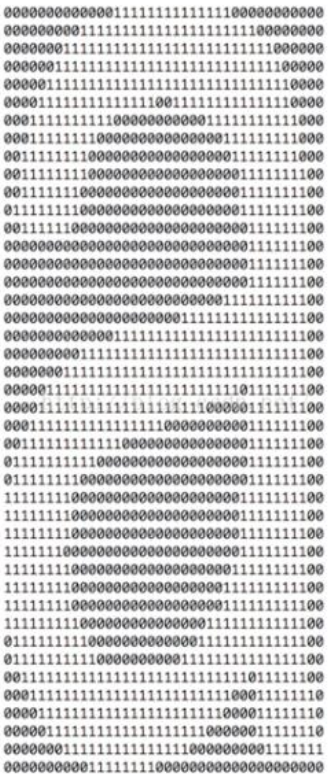

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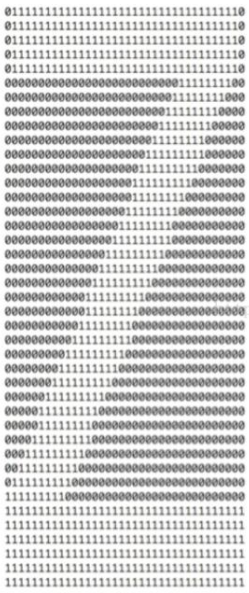

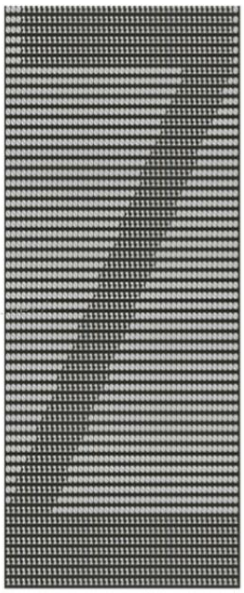

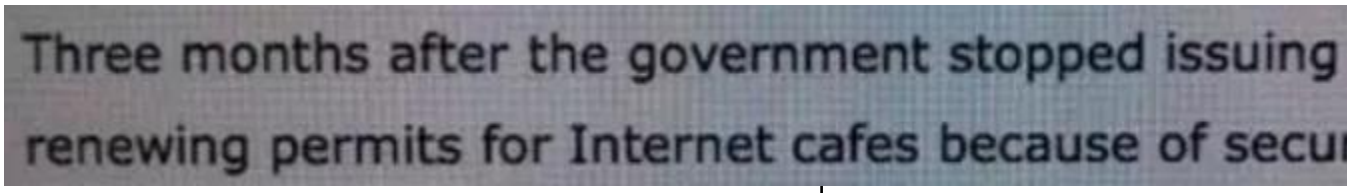

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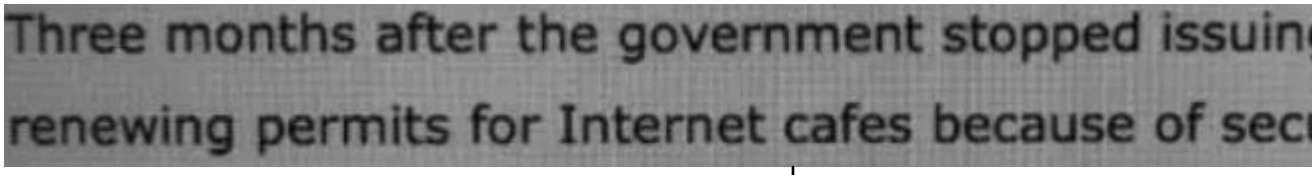

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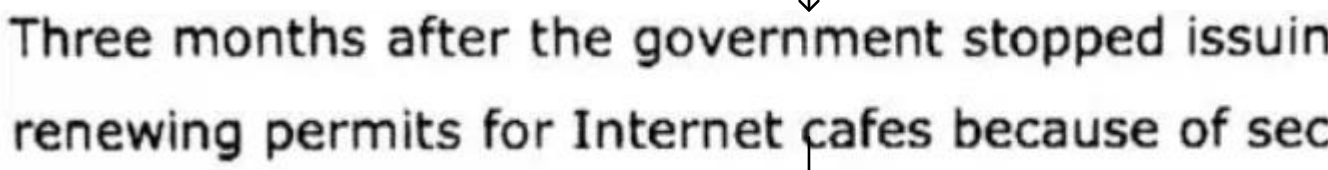

Denoising

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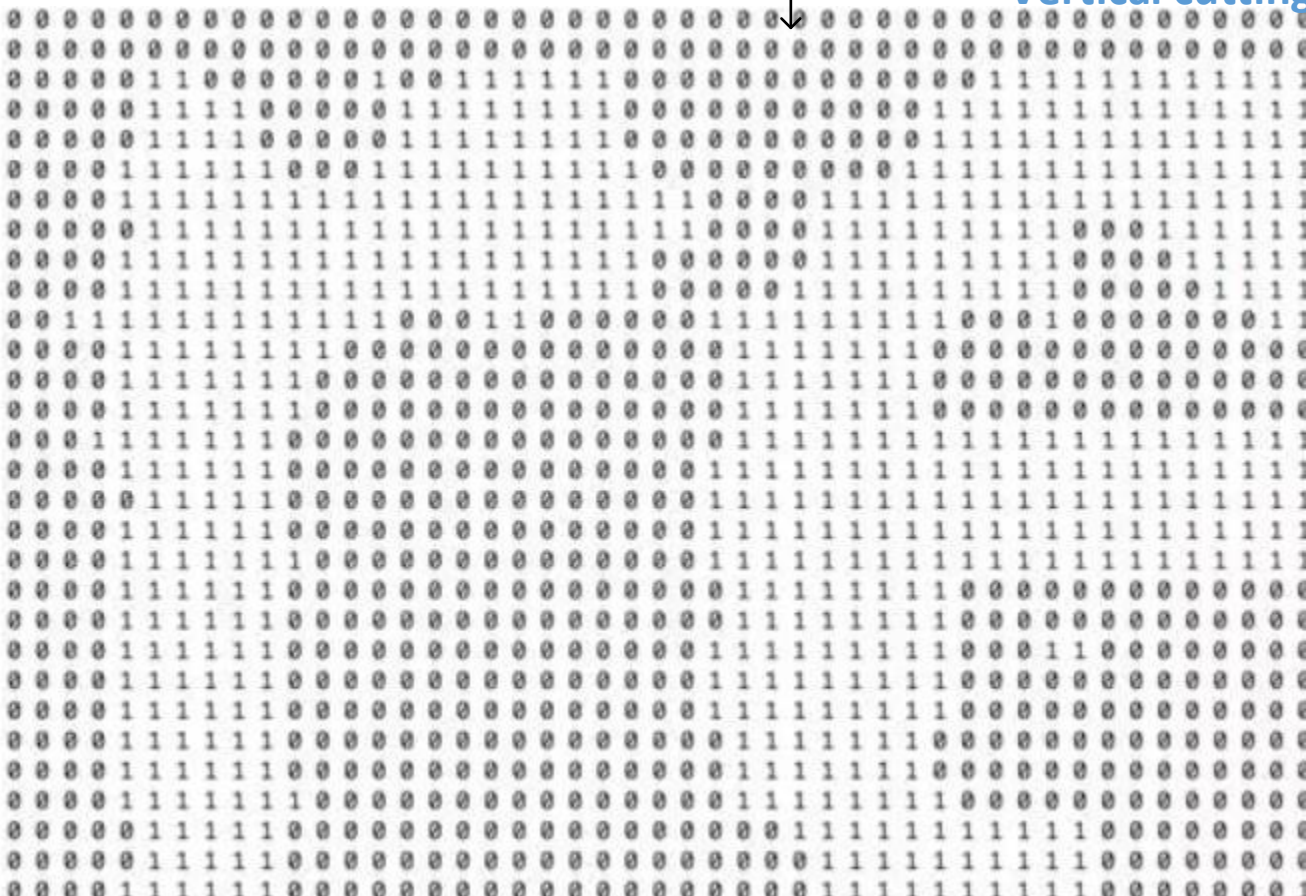
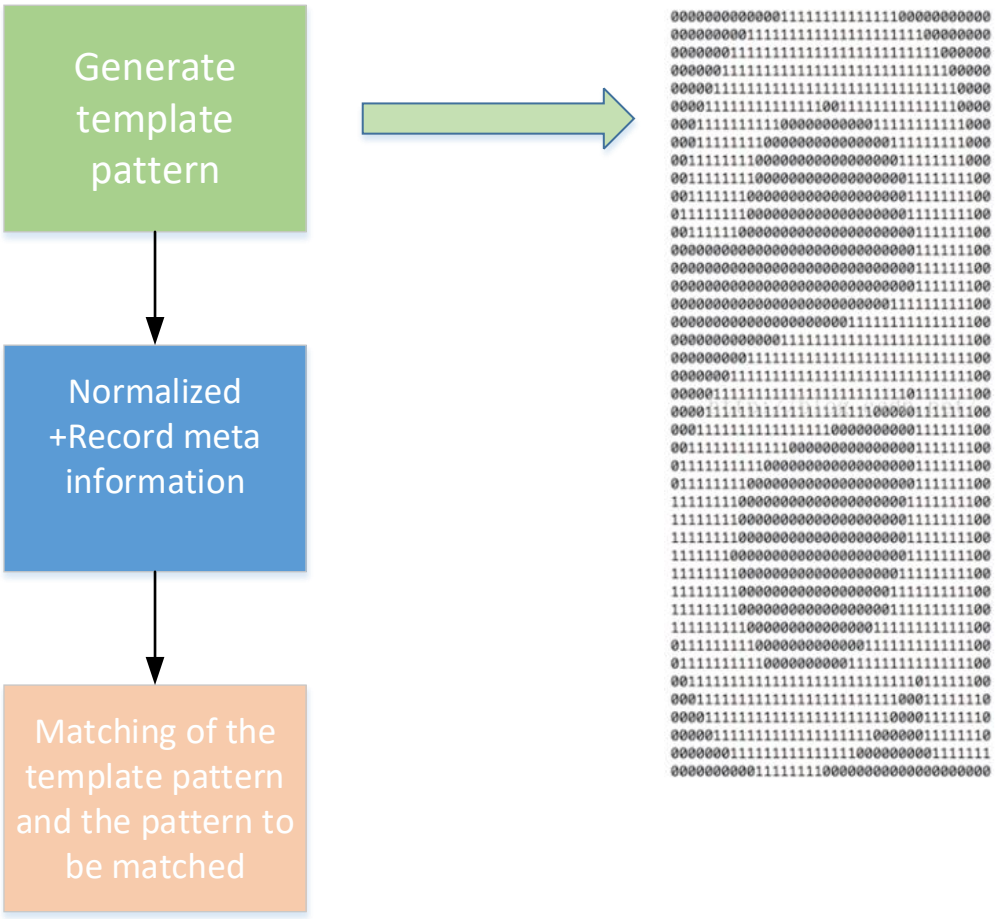
Vertical cutting

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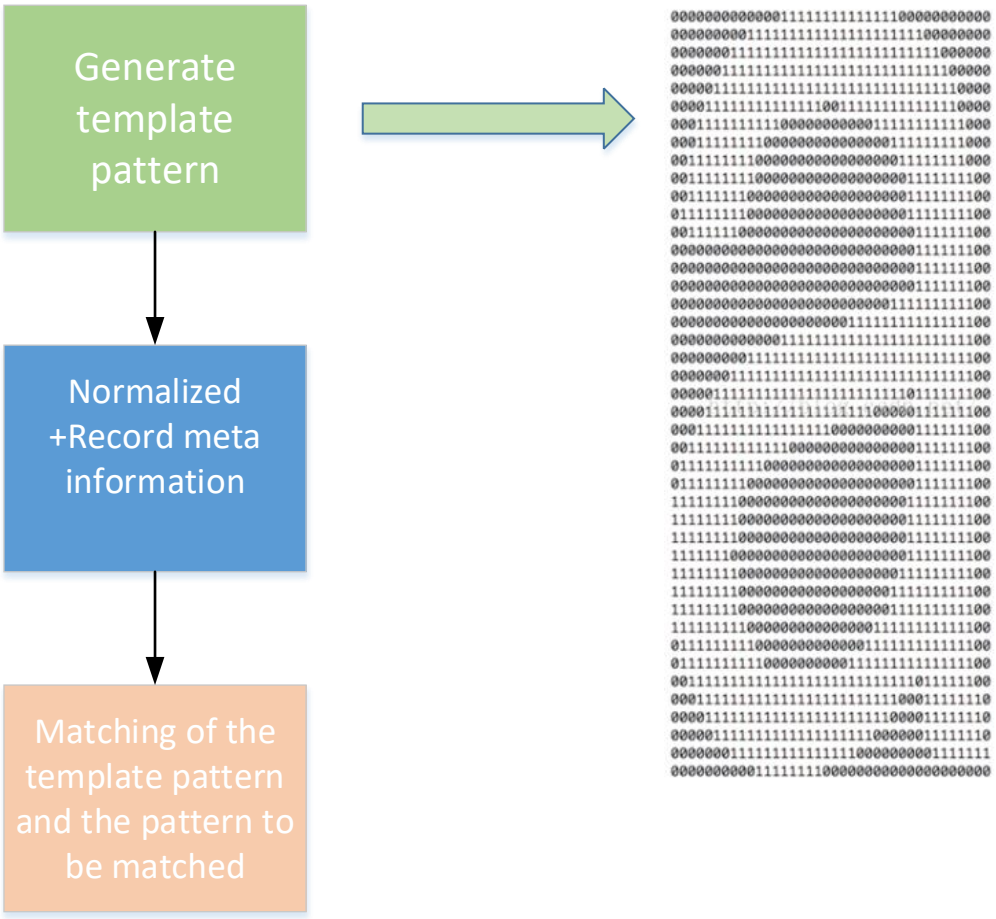
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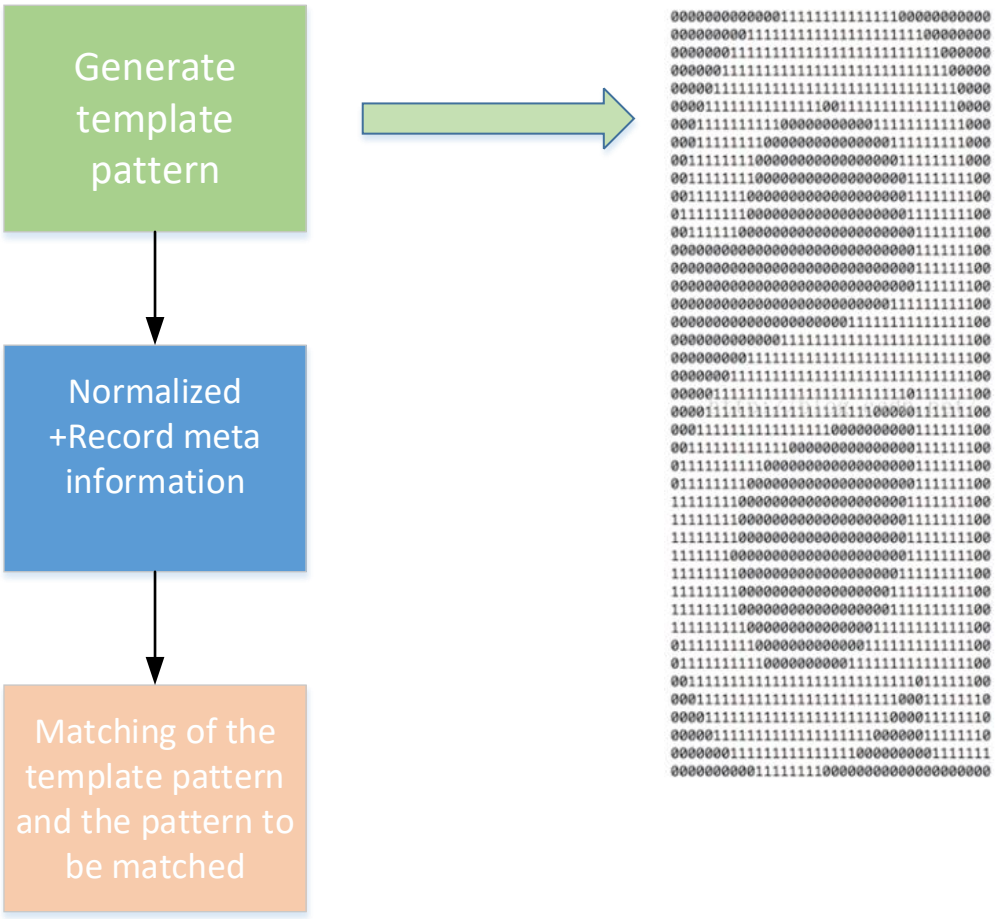
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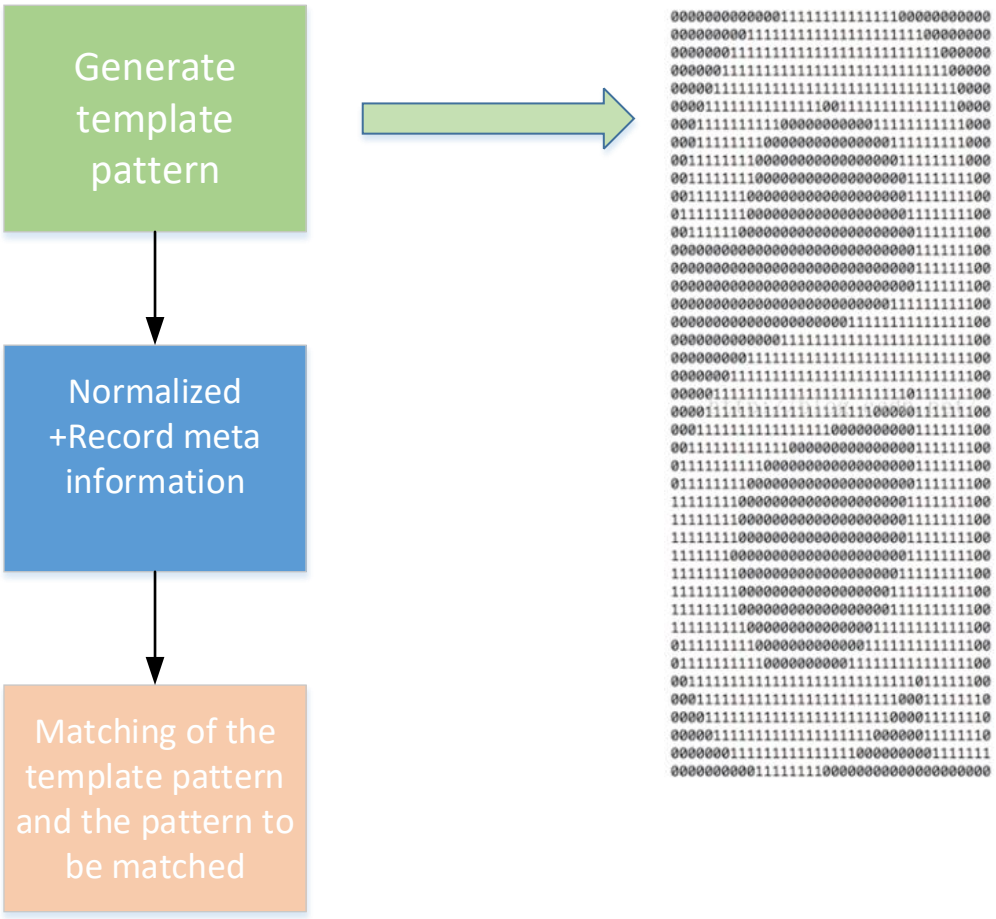
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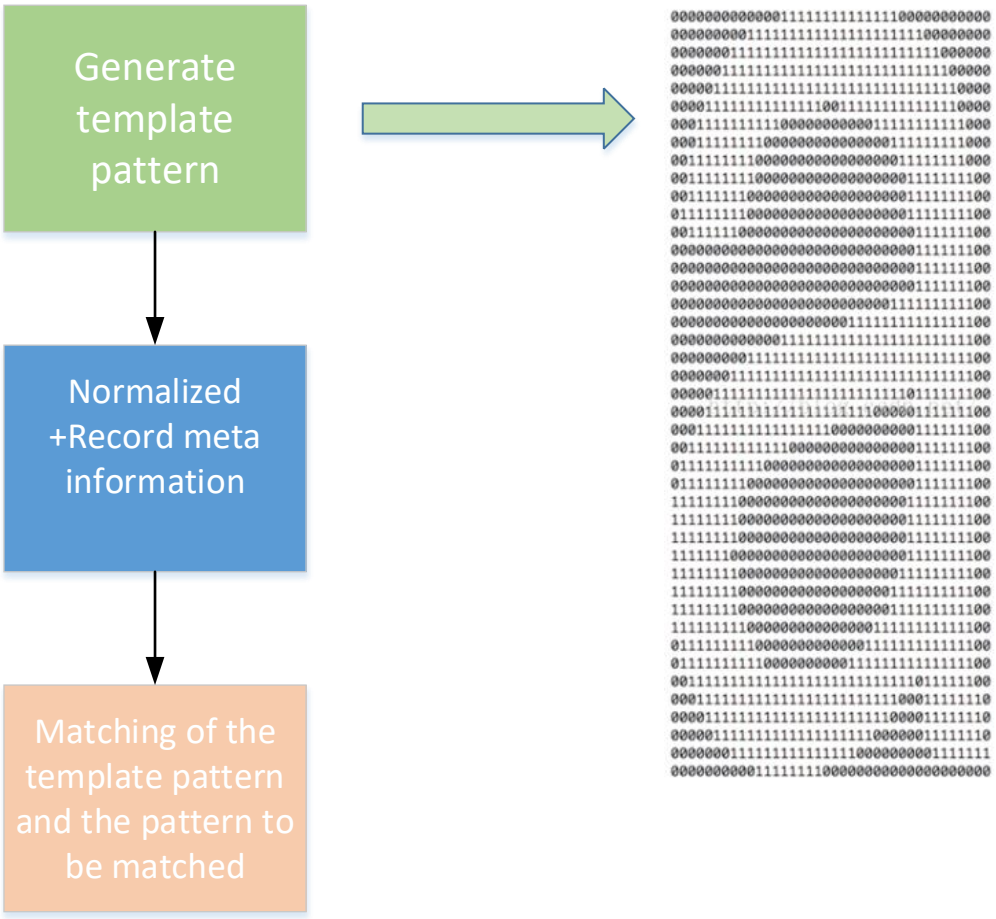
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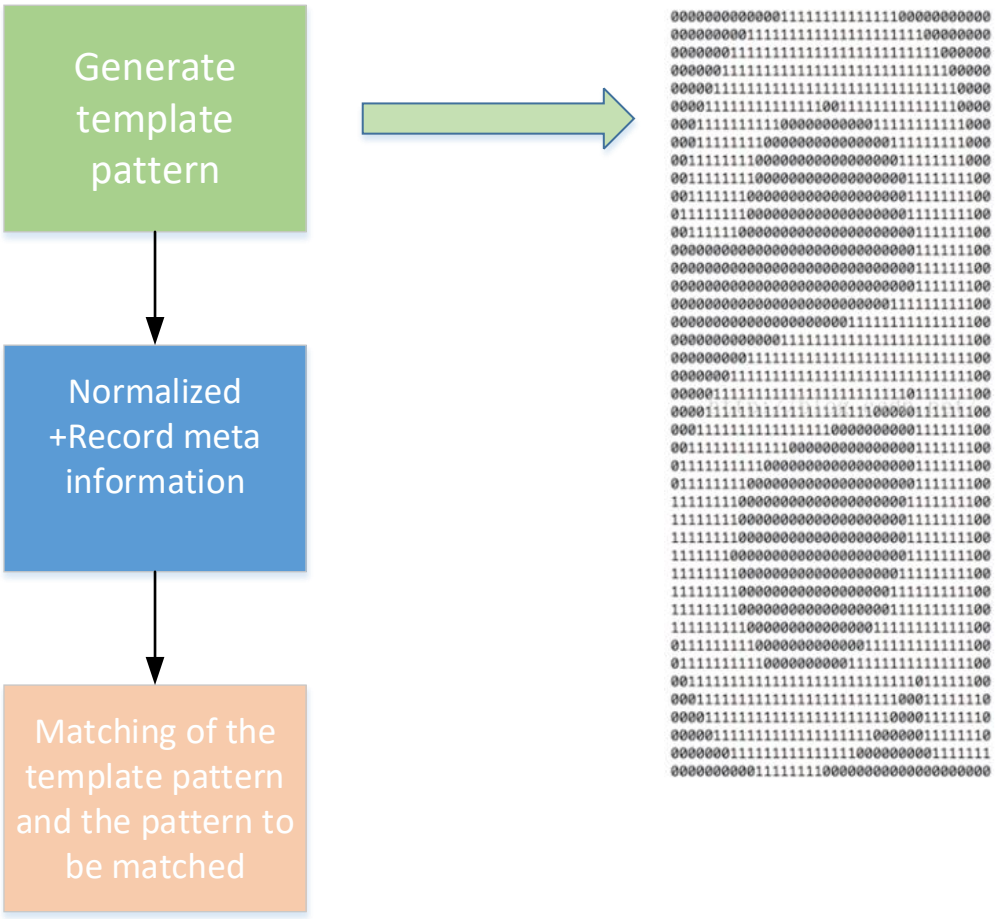
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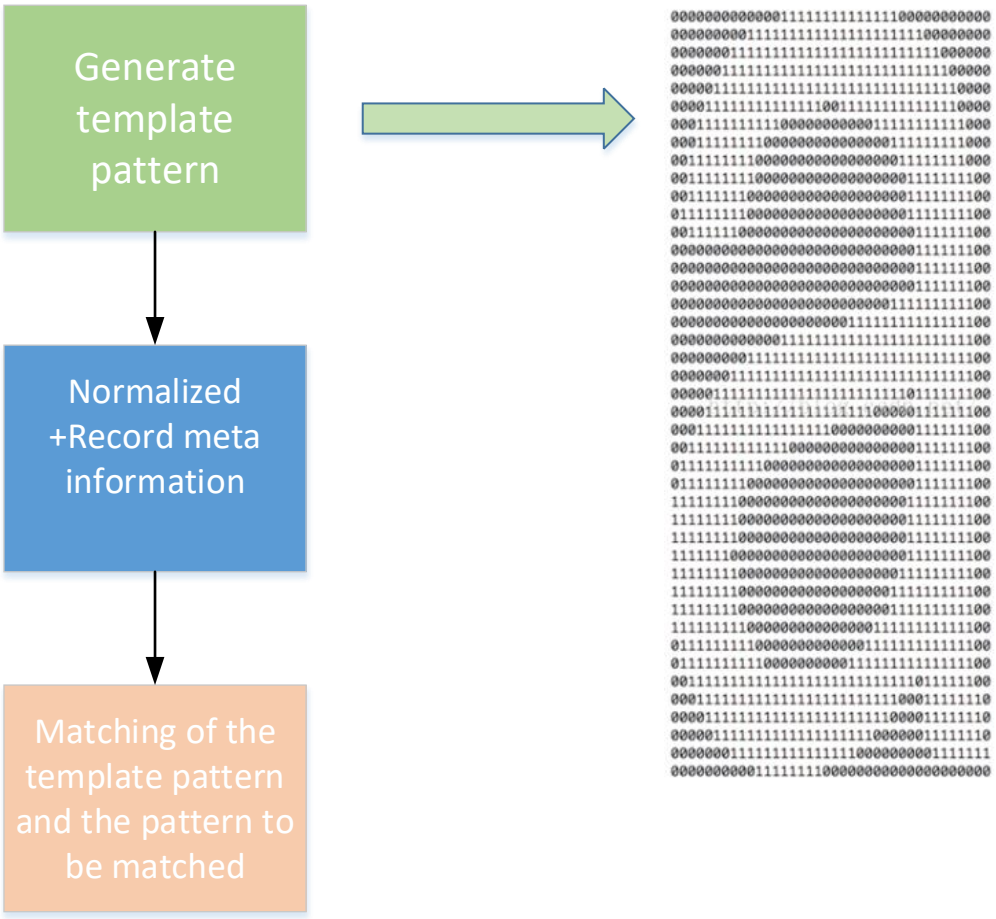
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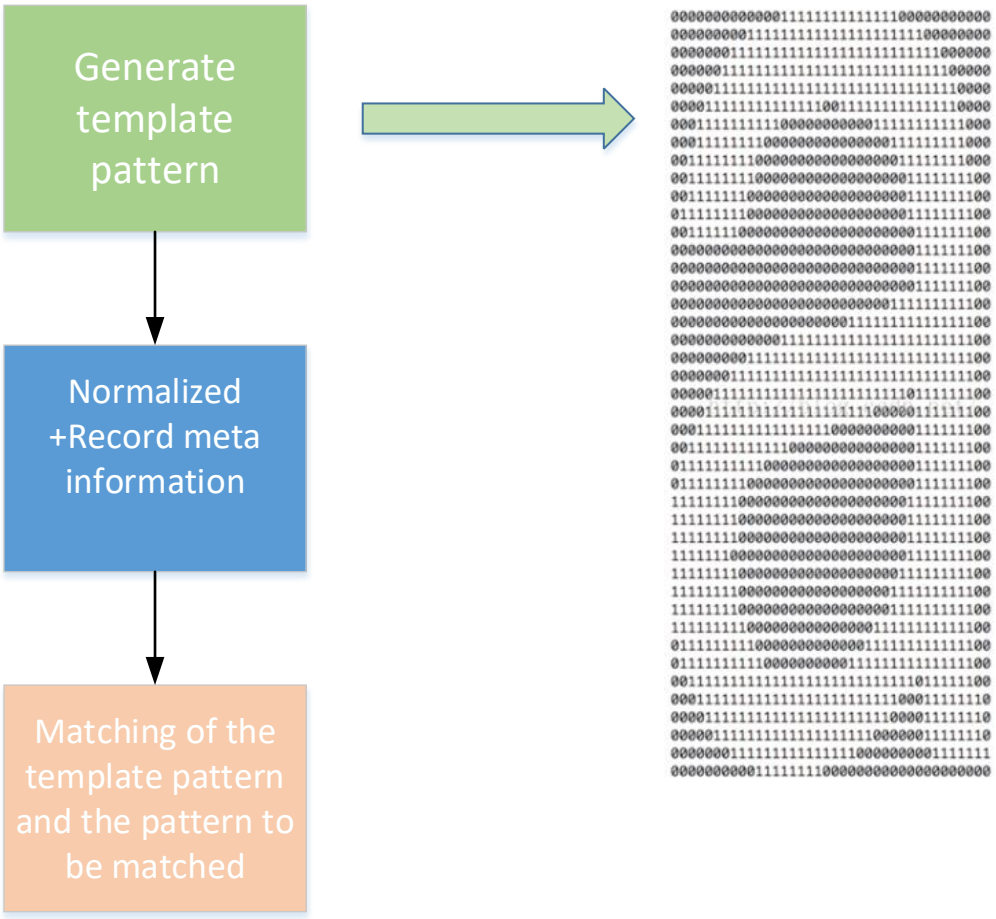
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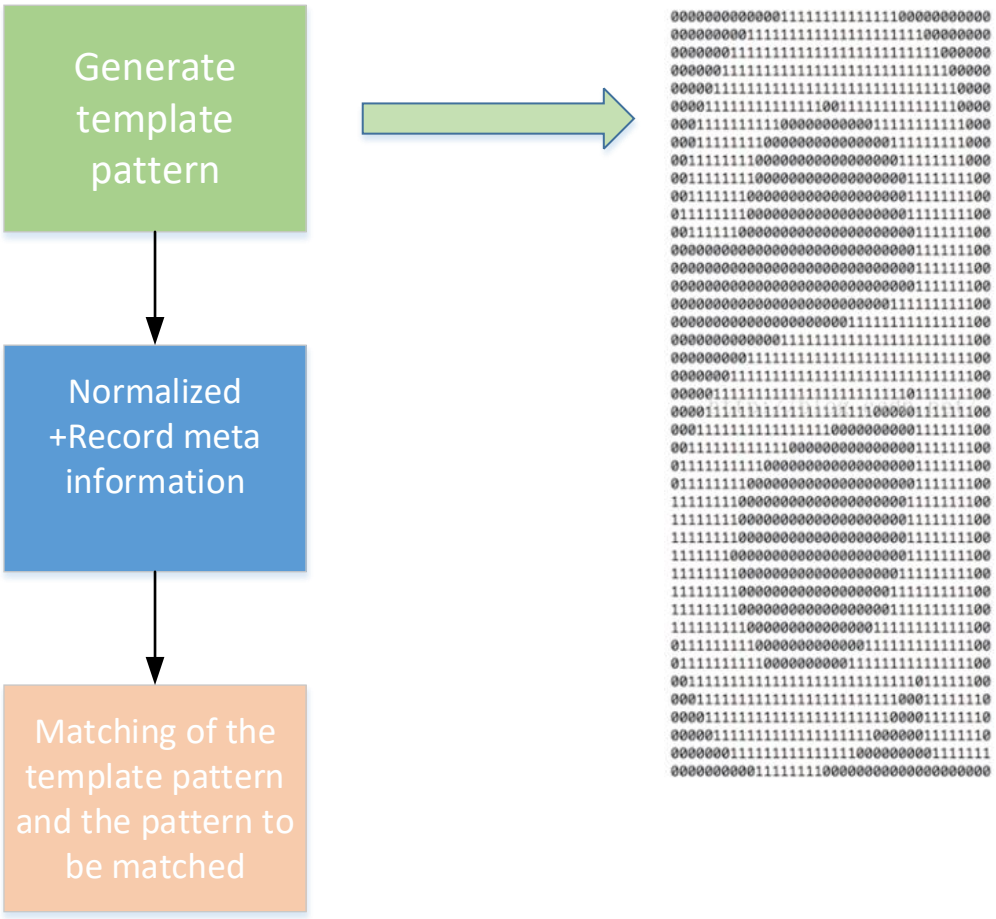
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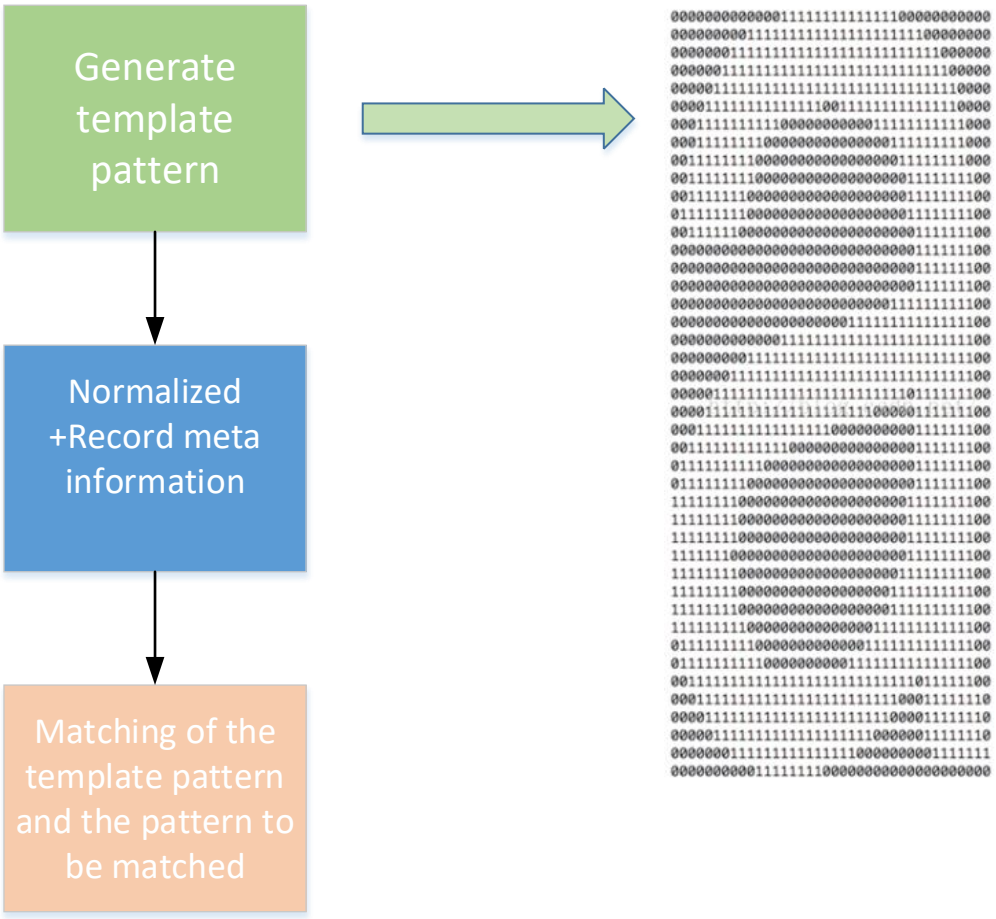
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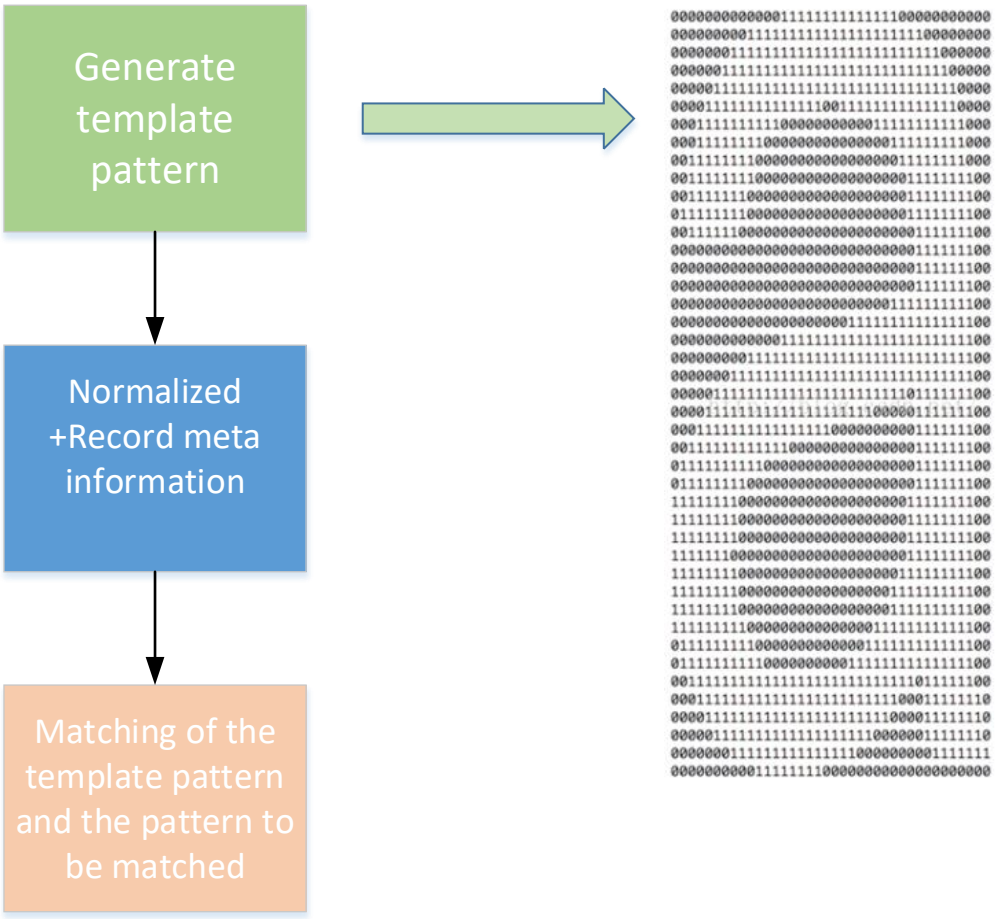
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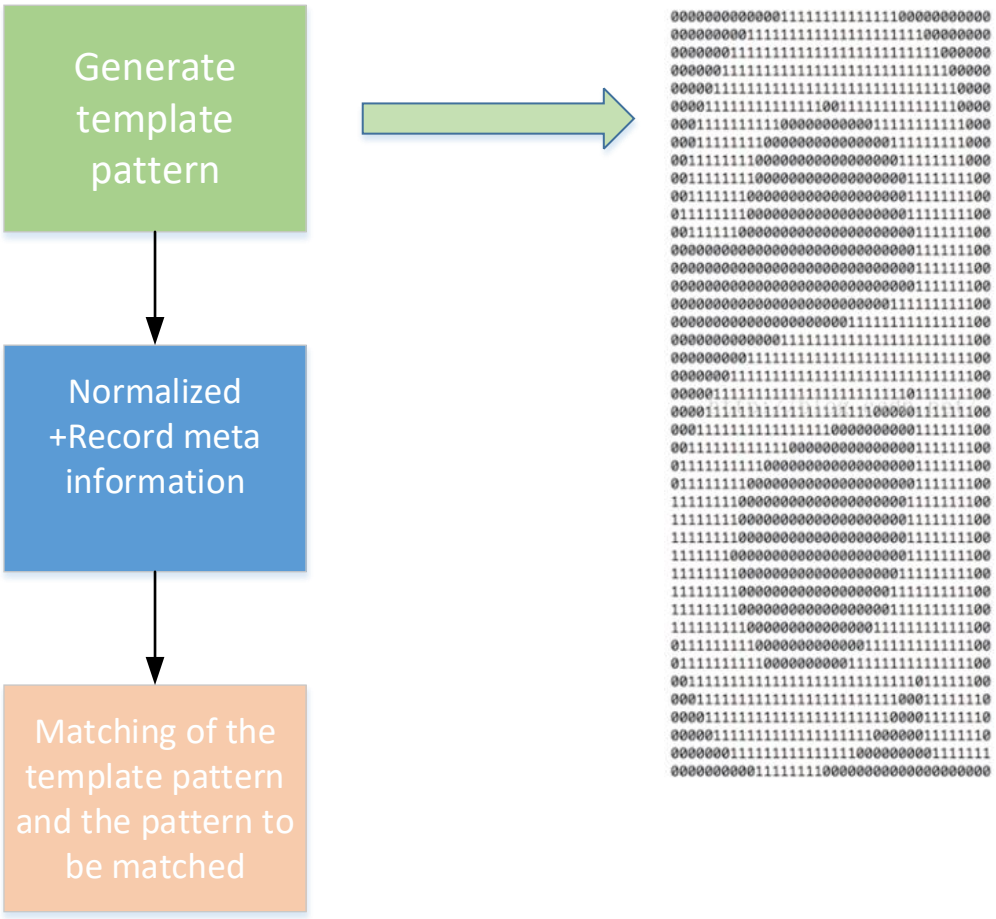
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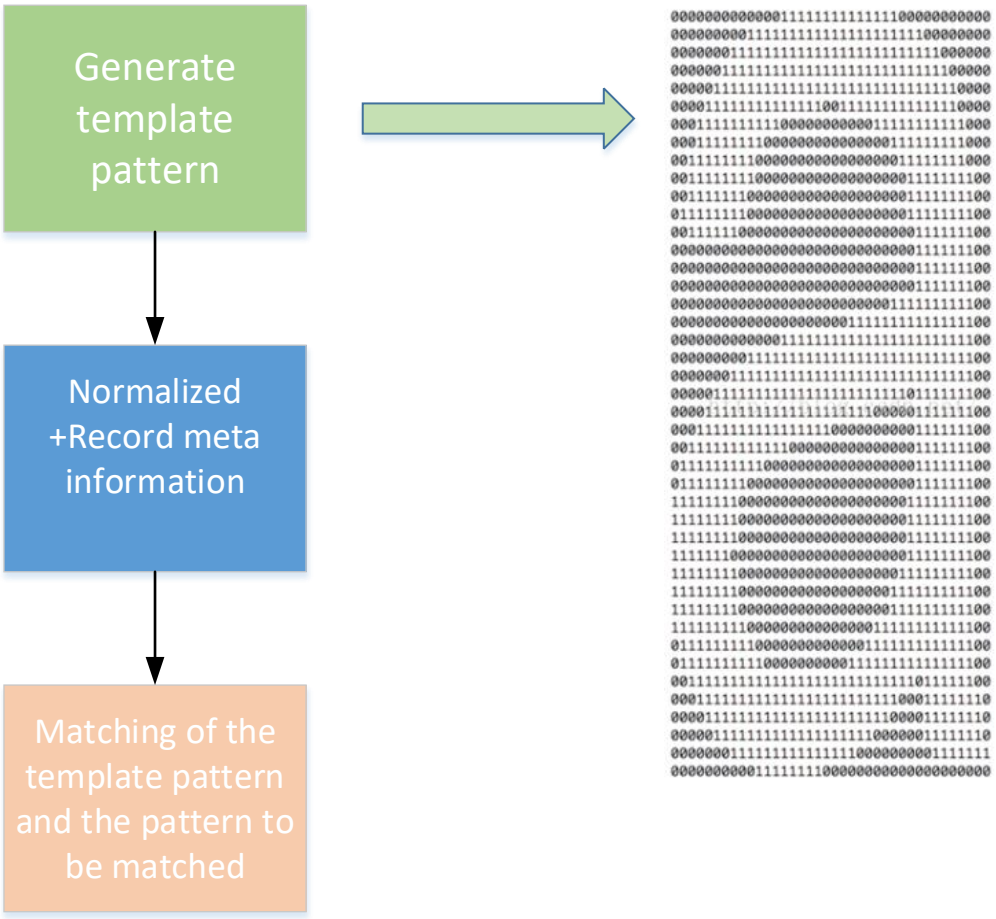
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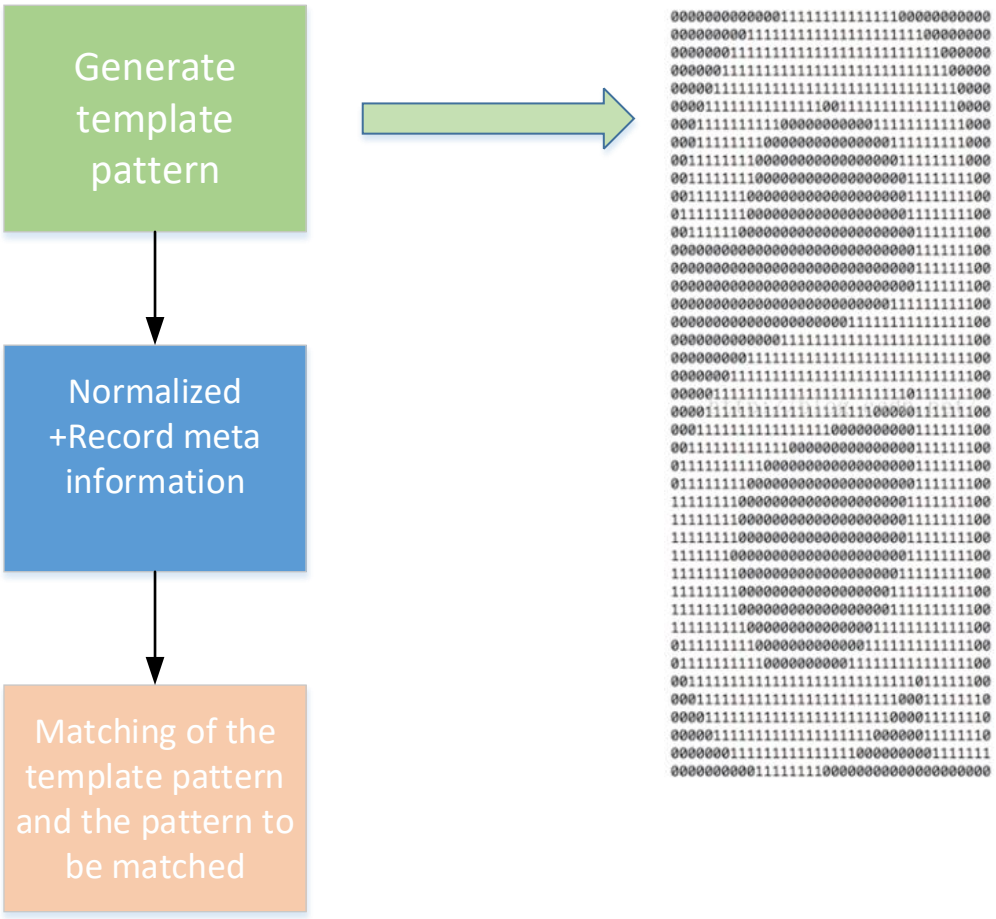
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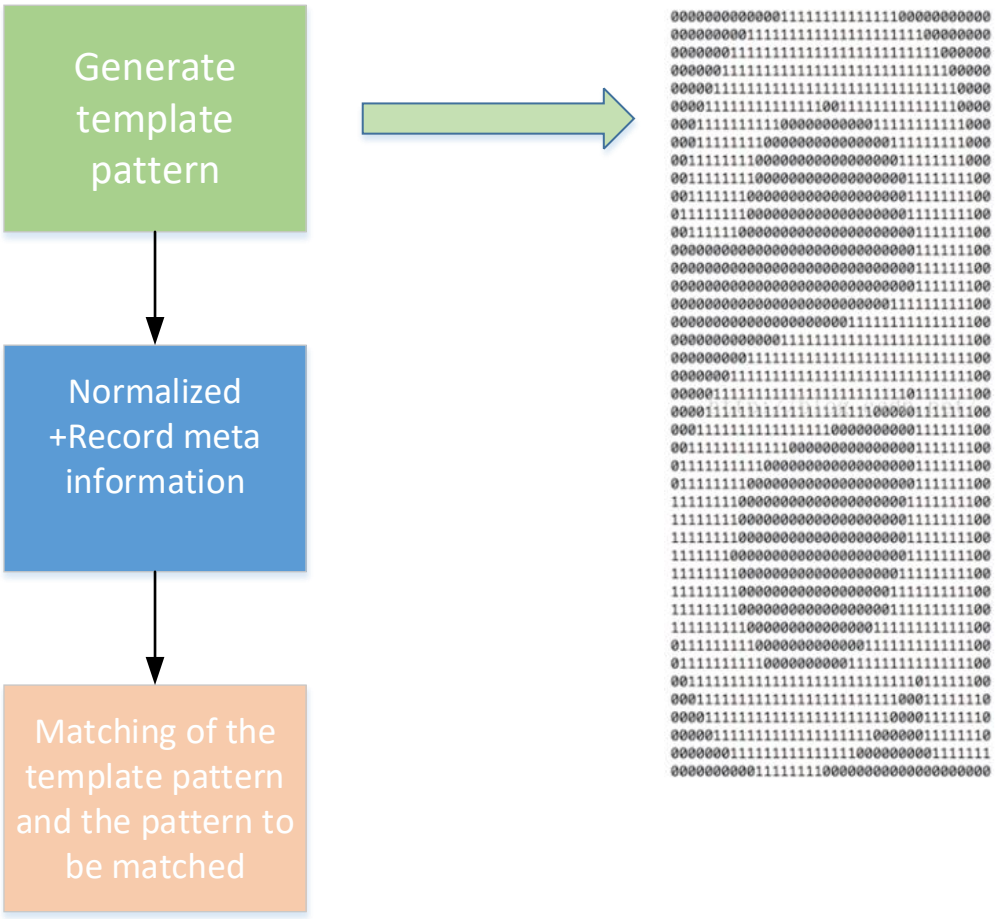
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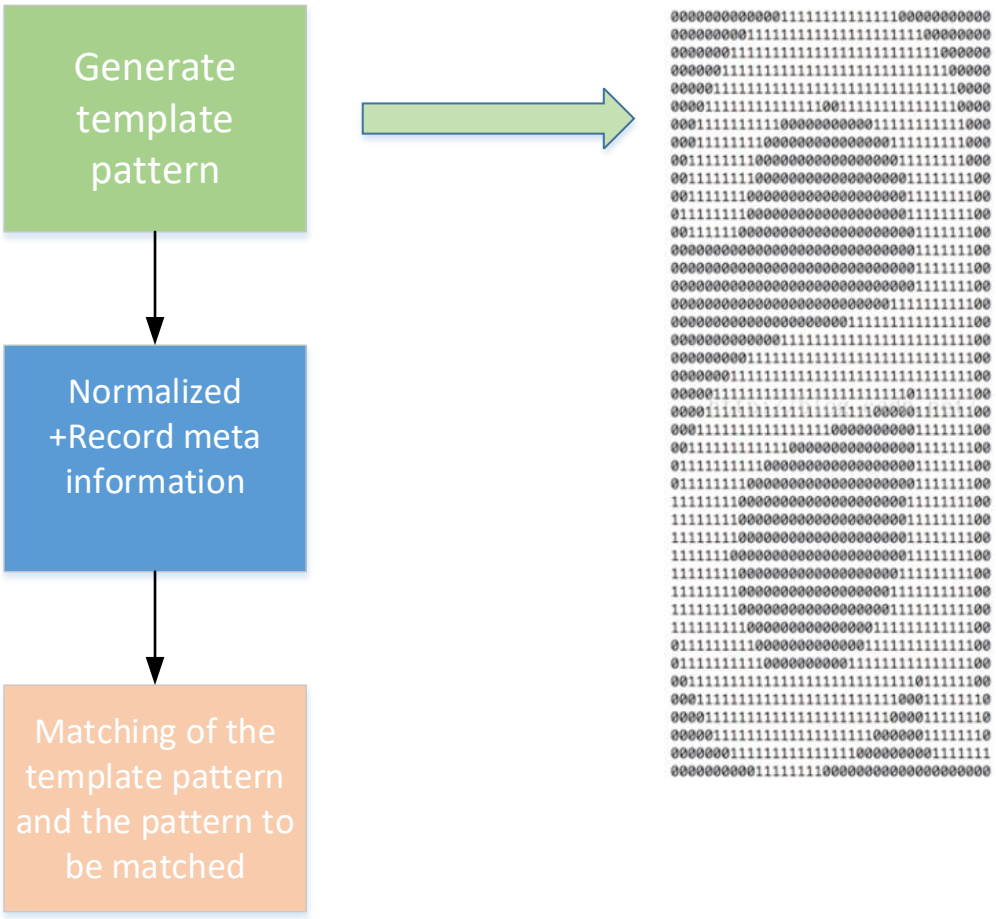
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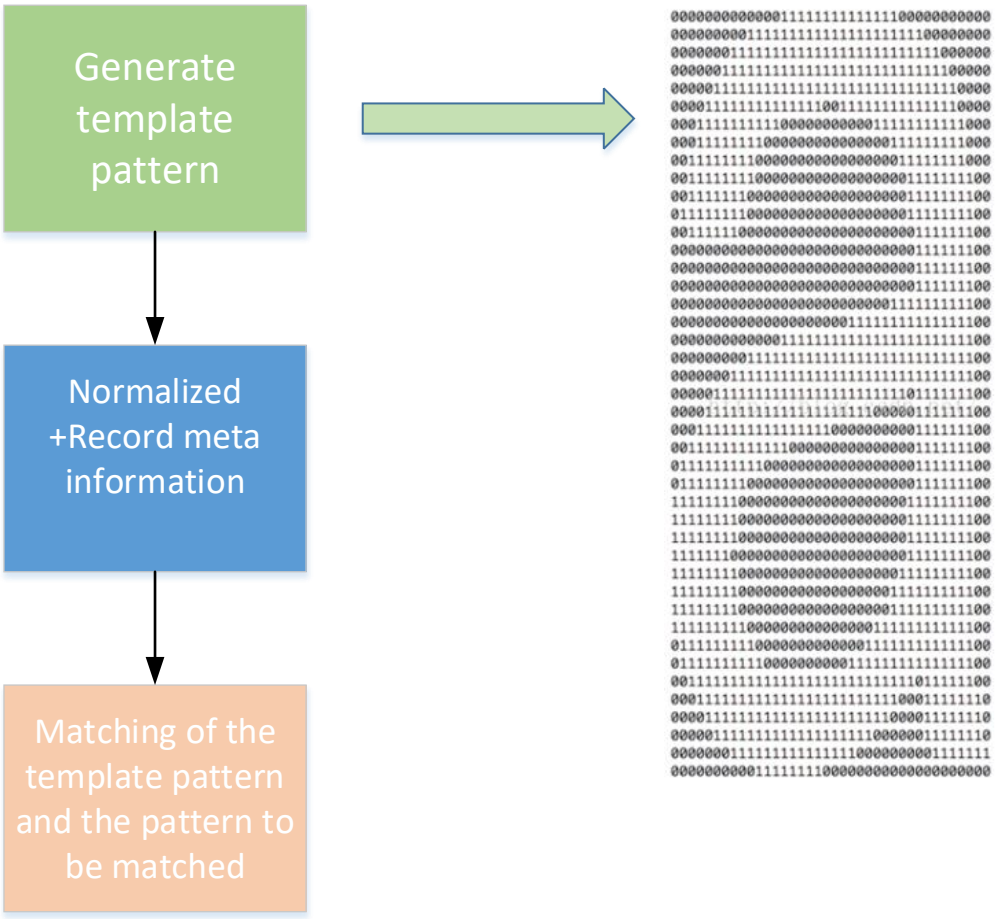
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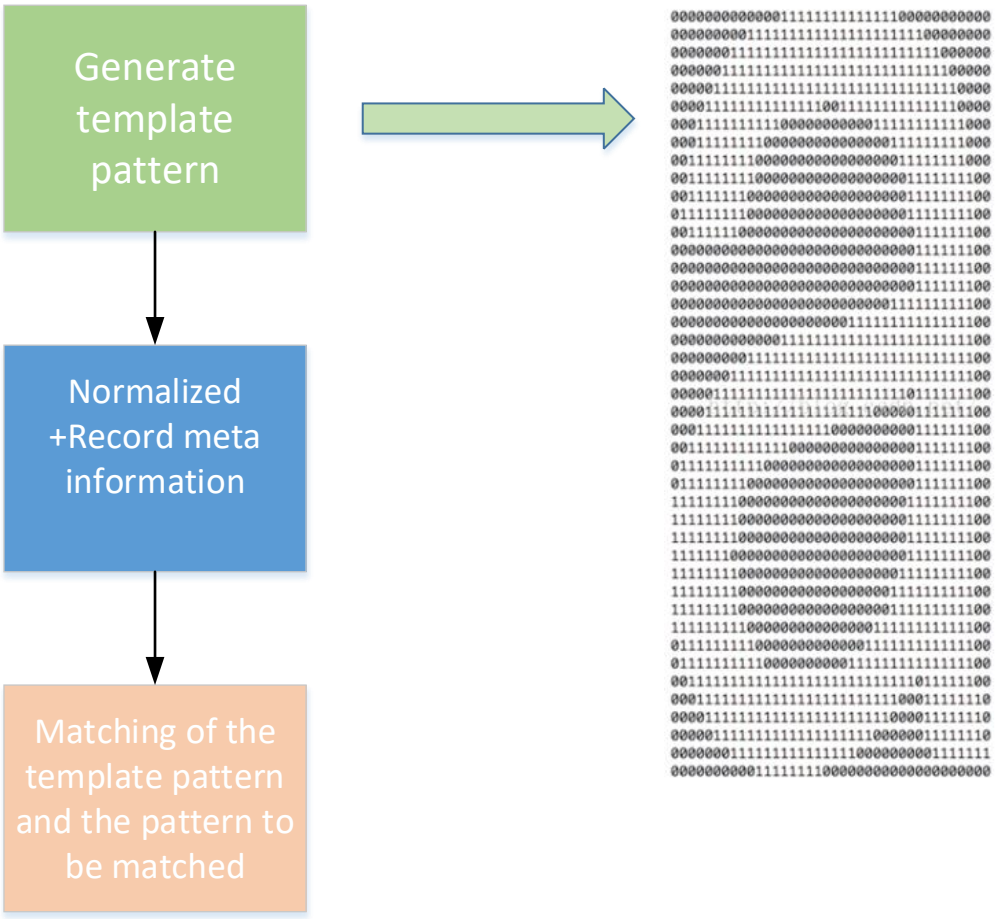
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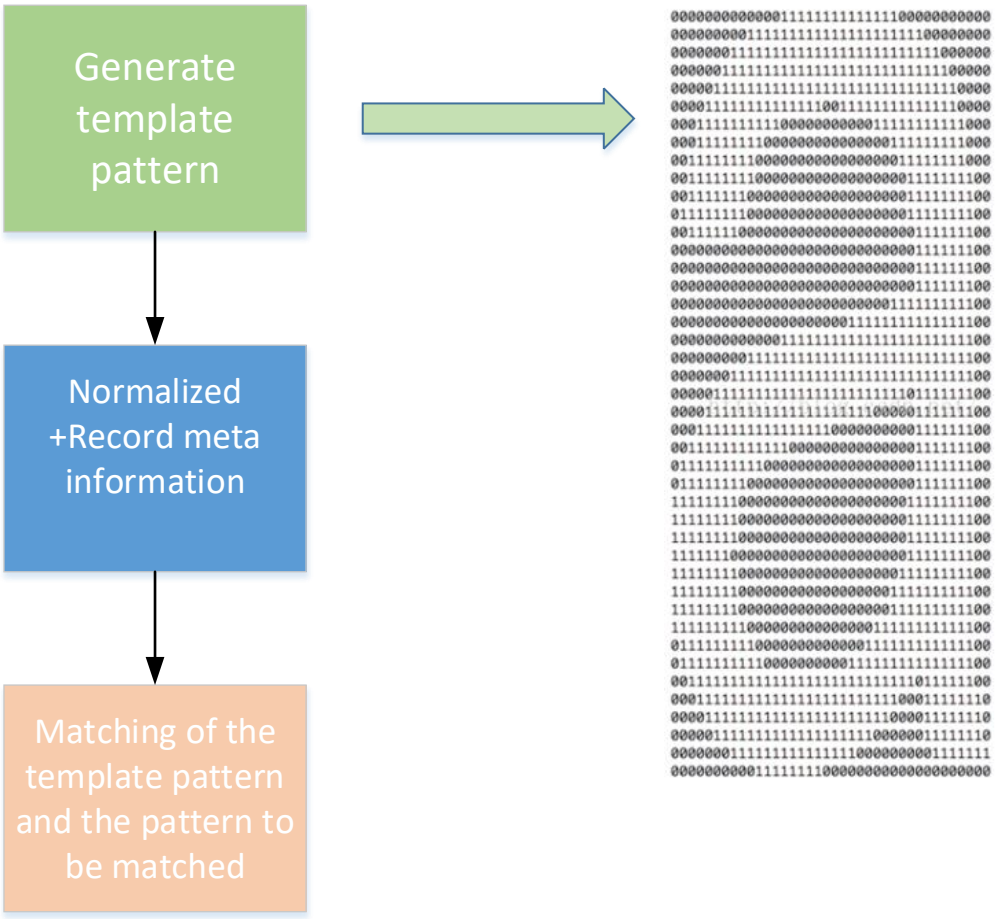
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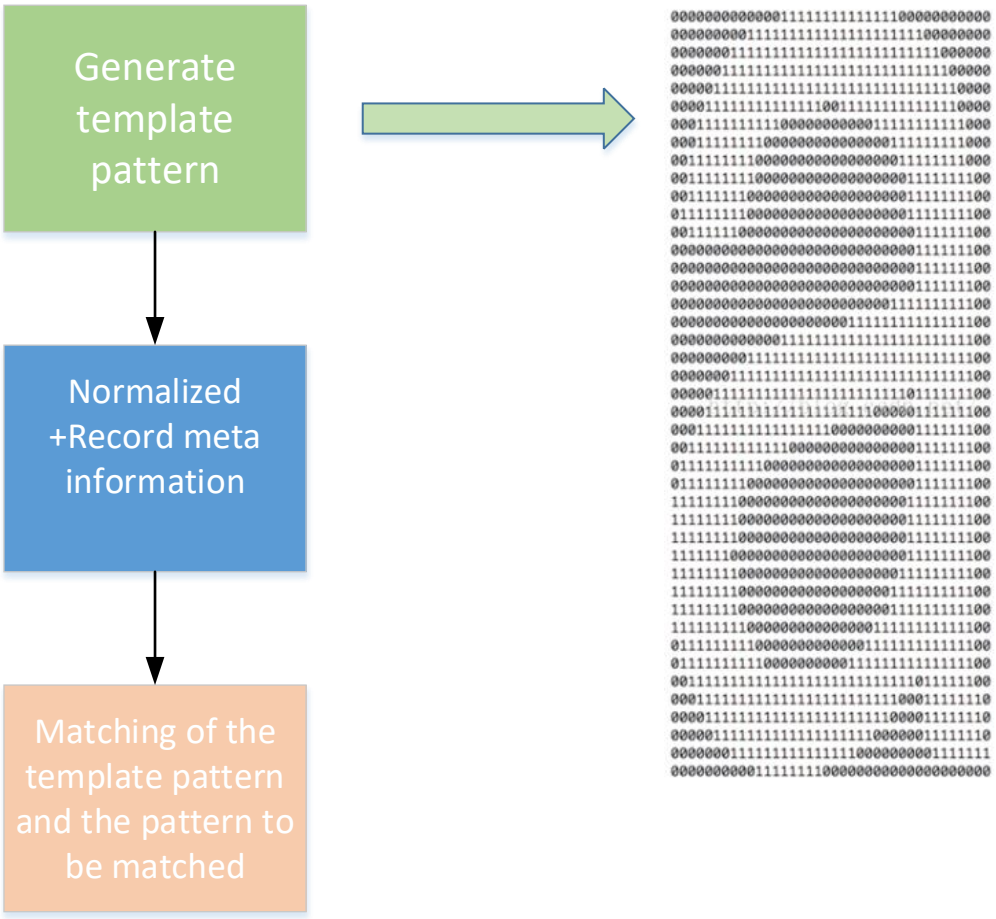
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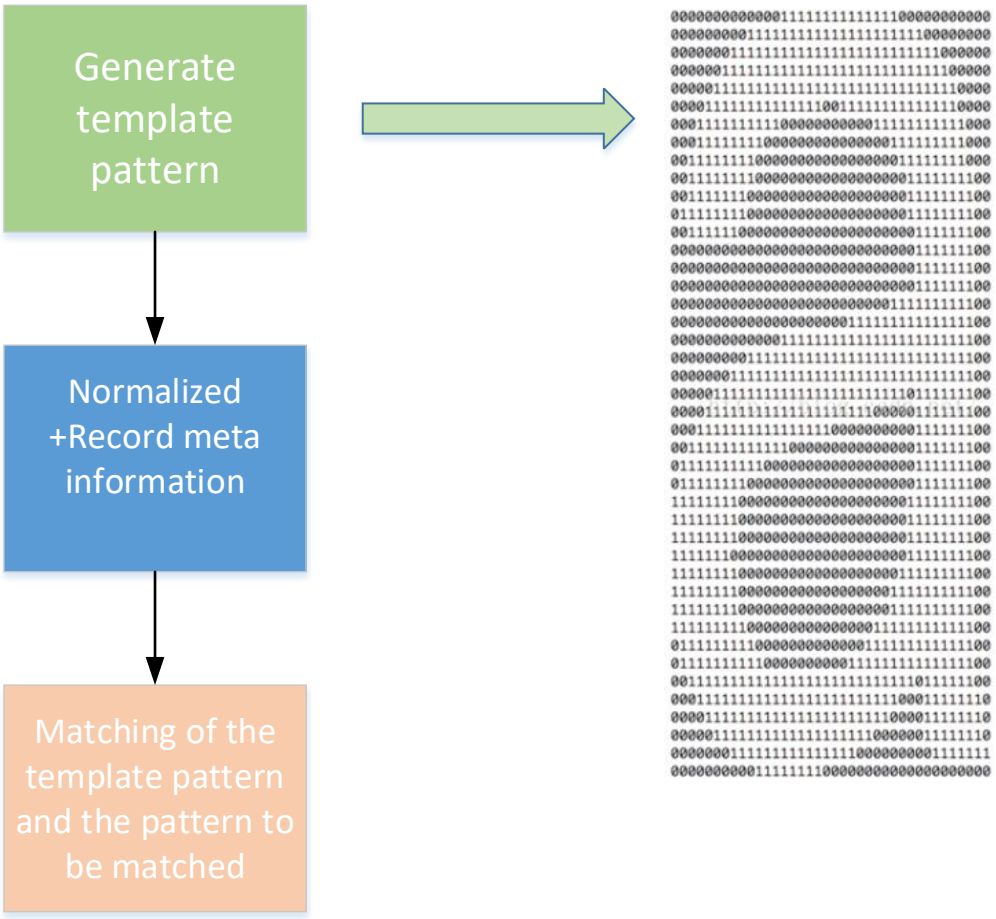
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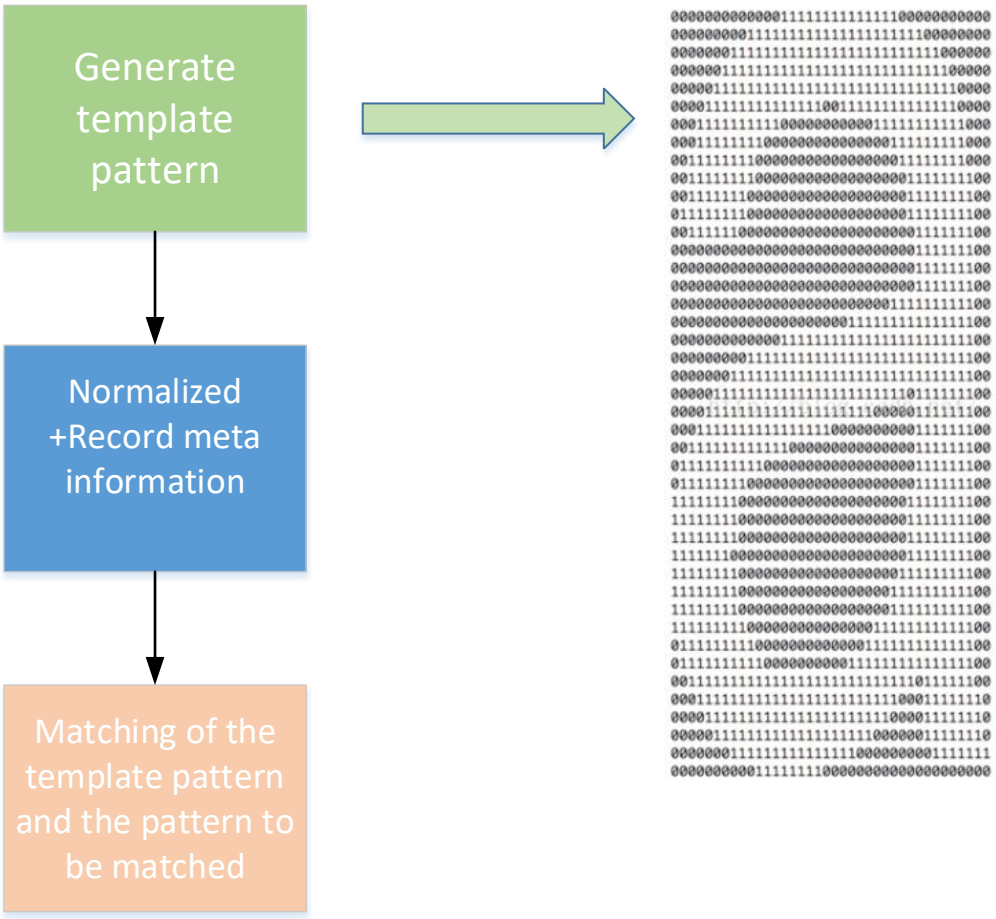
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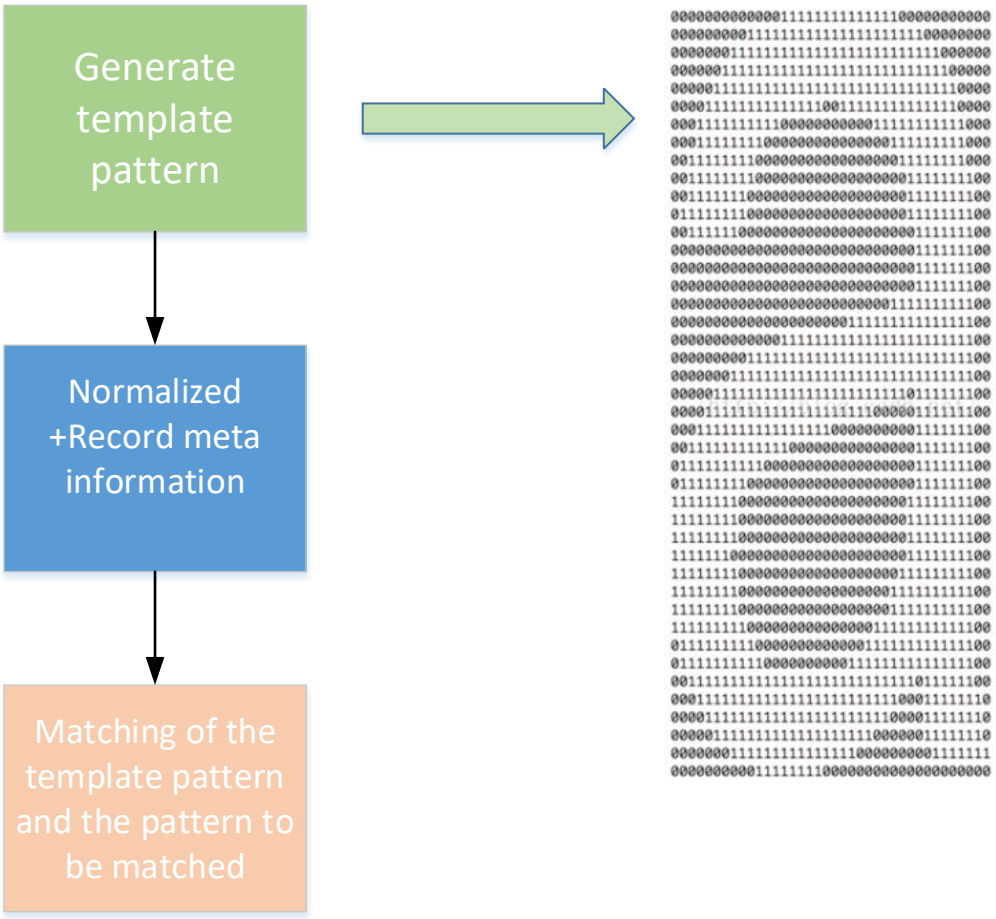
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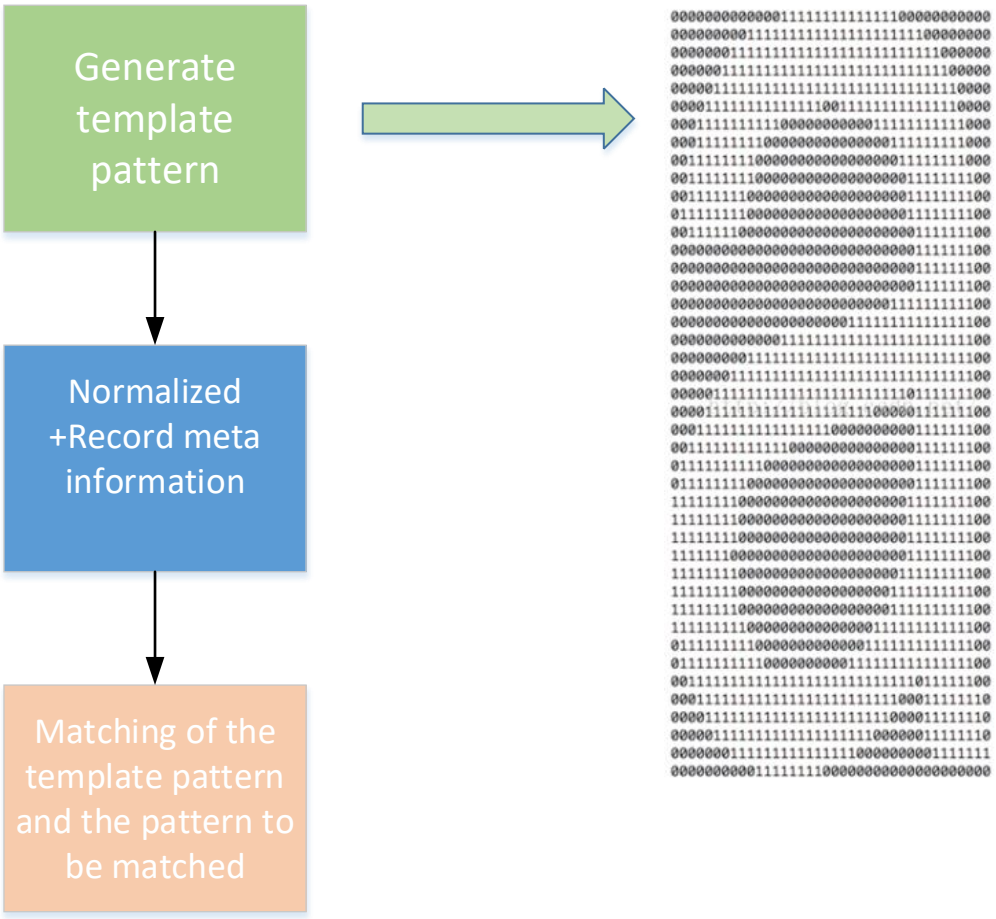
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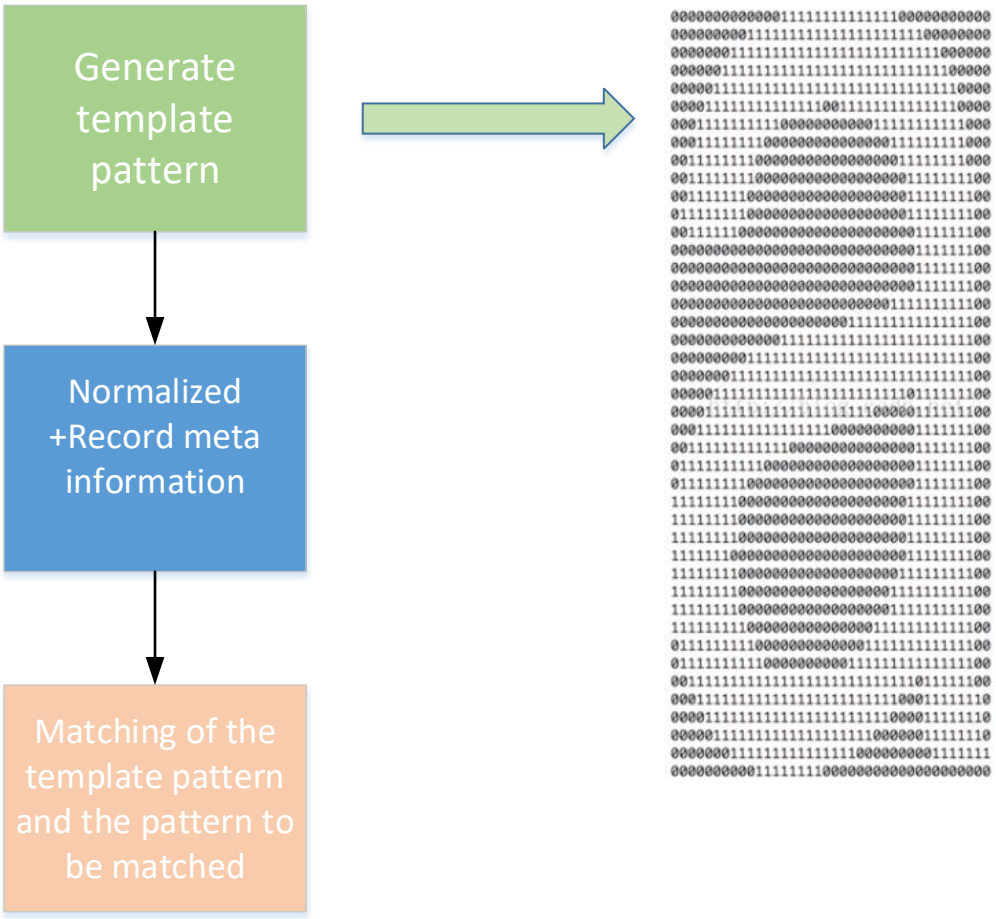
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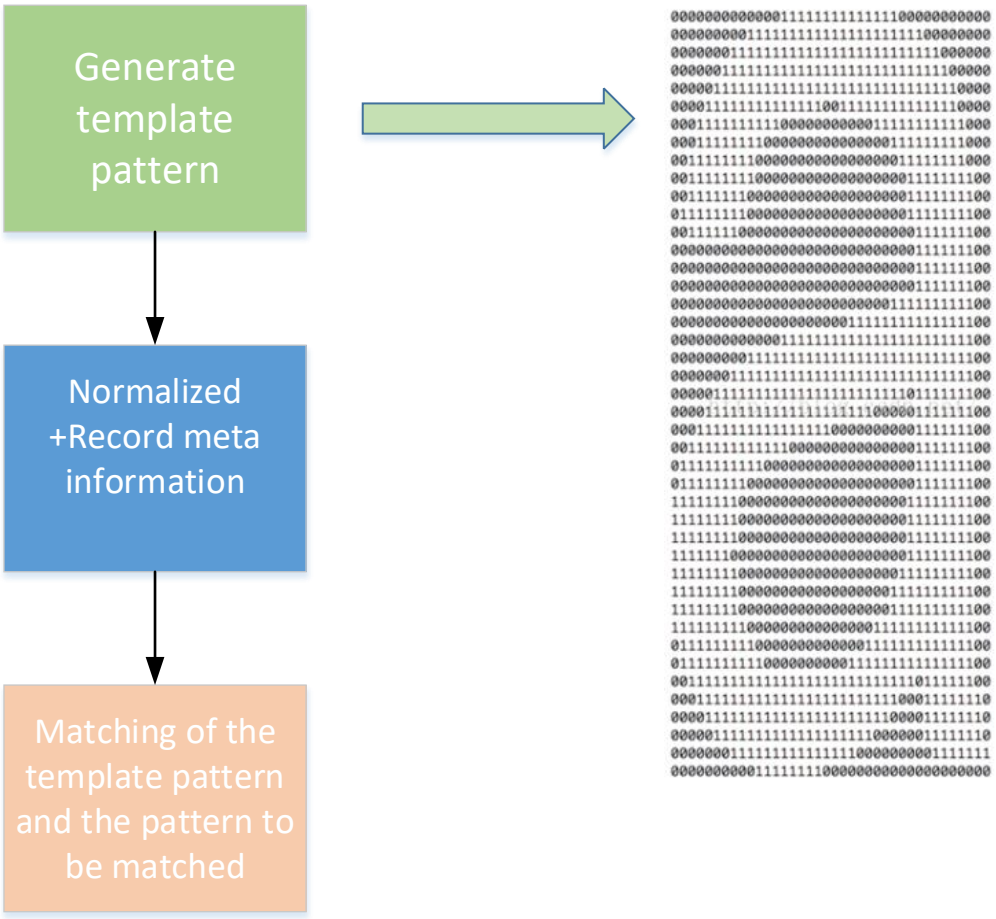
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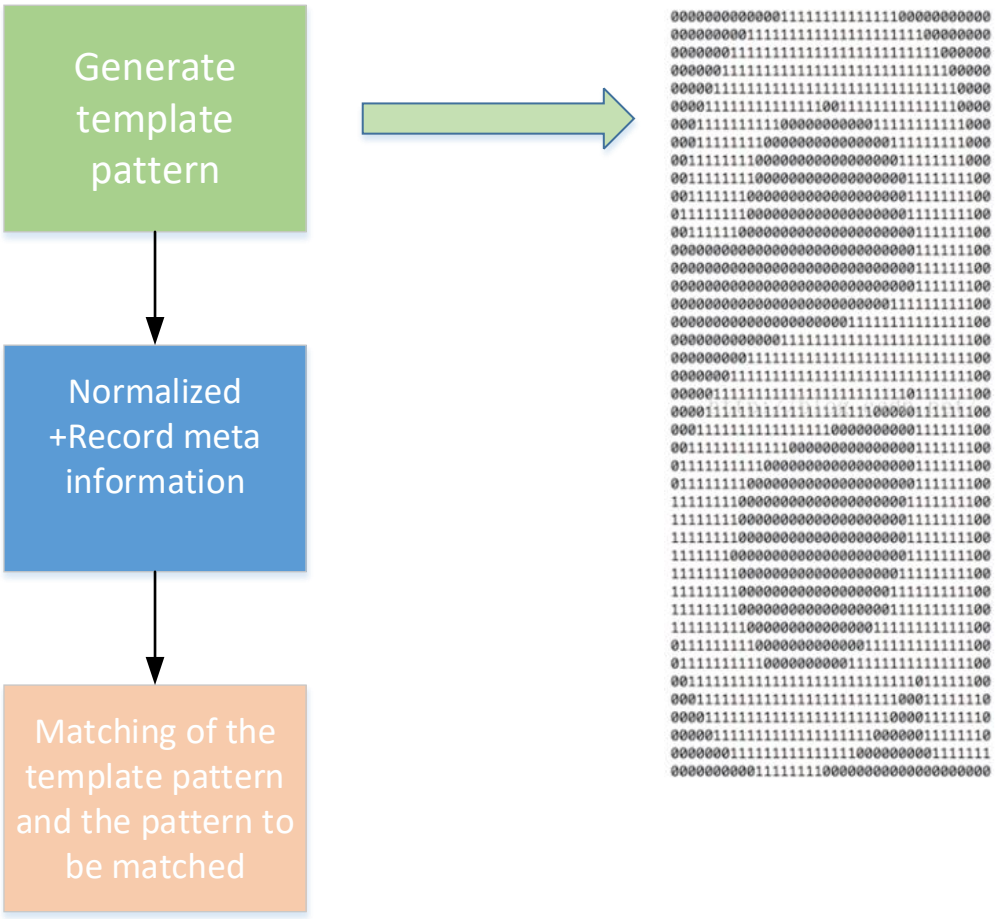
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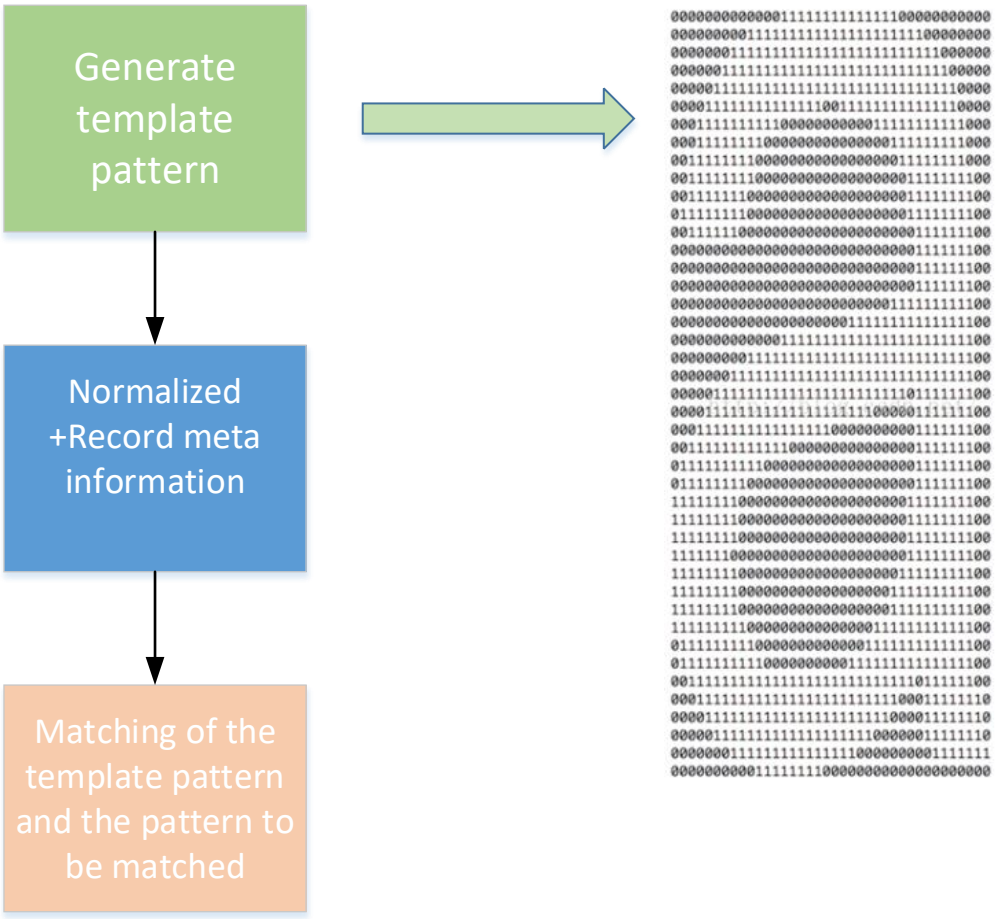
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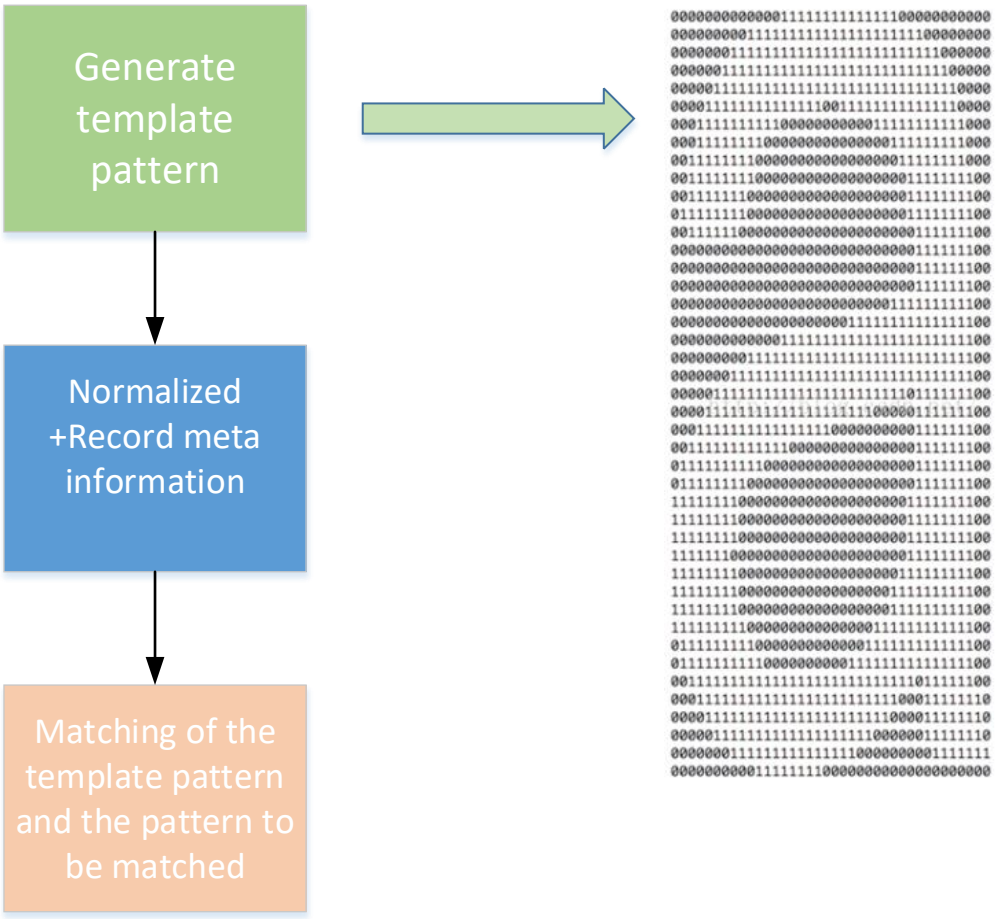
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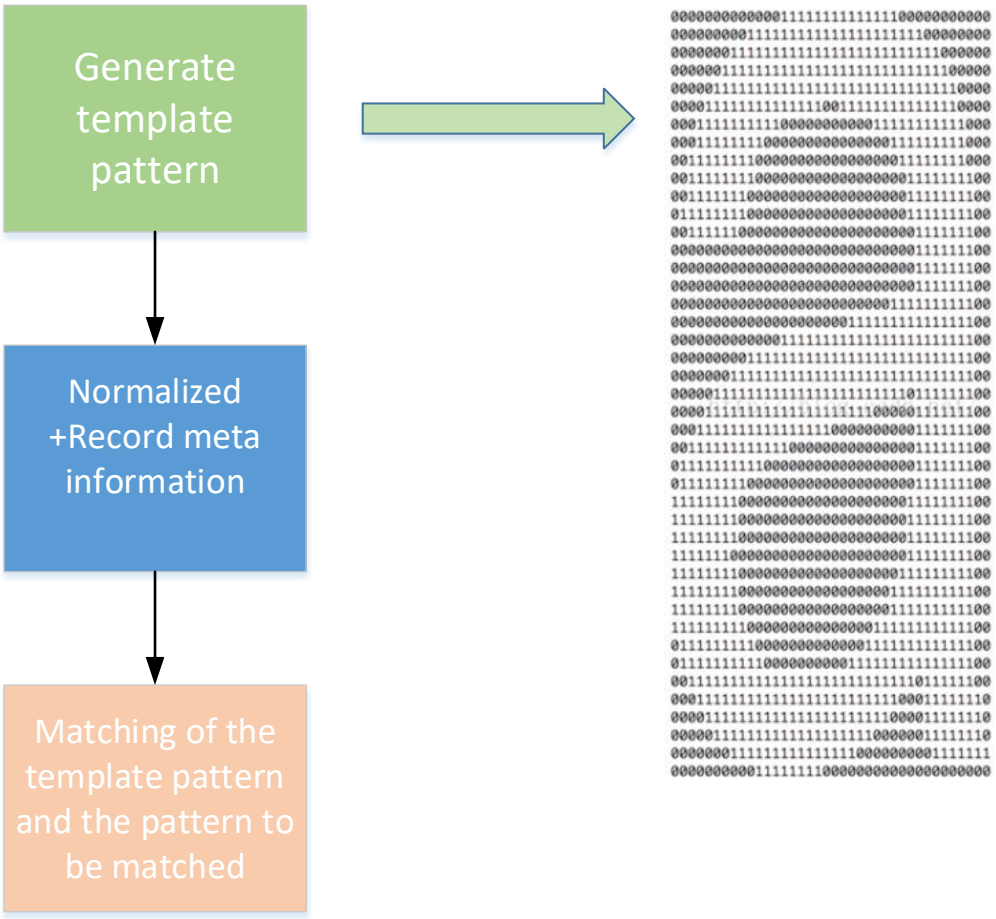
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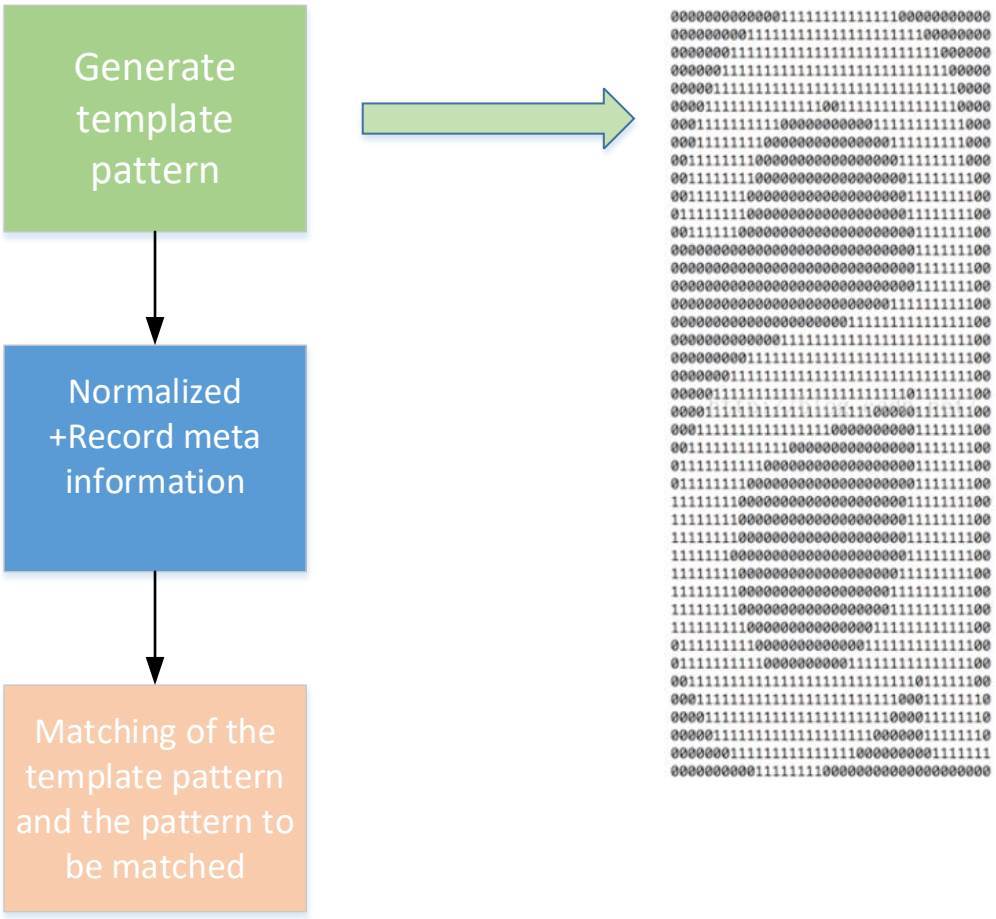
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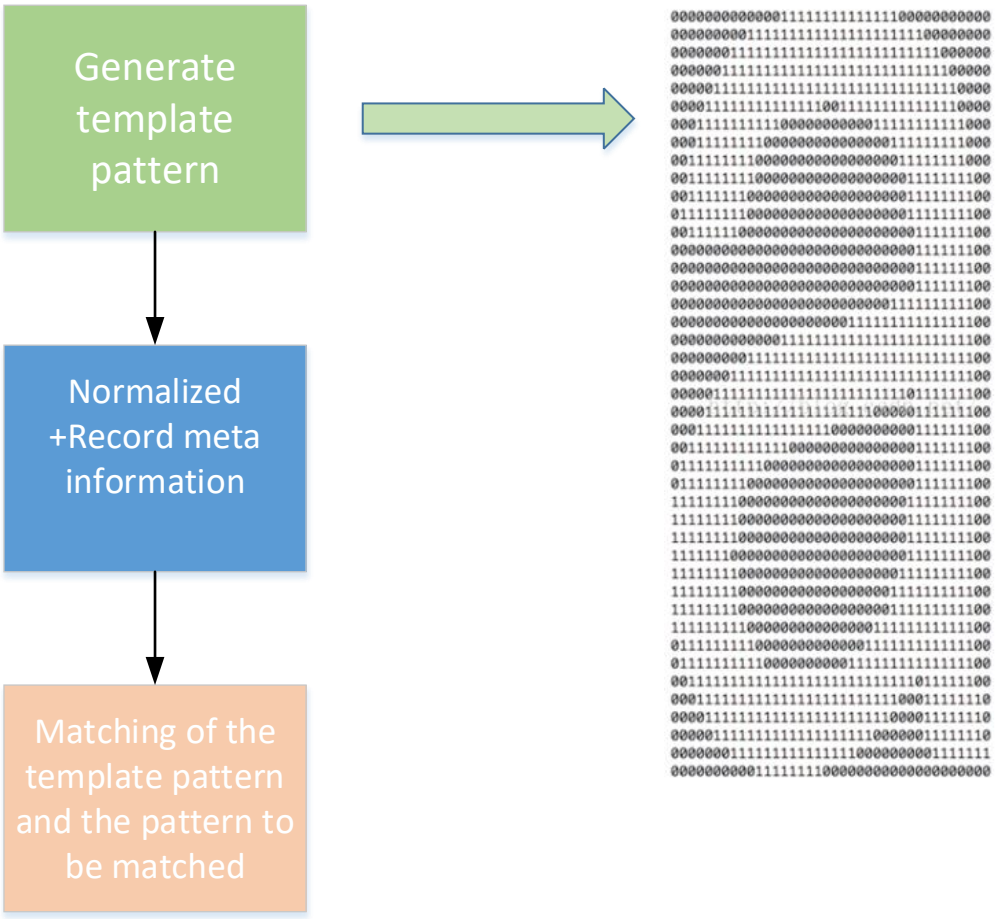
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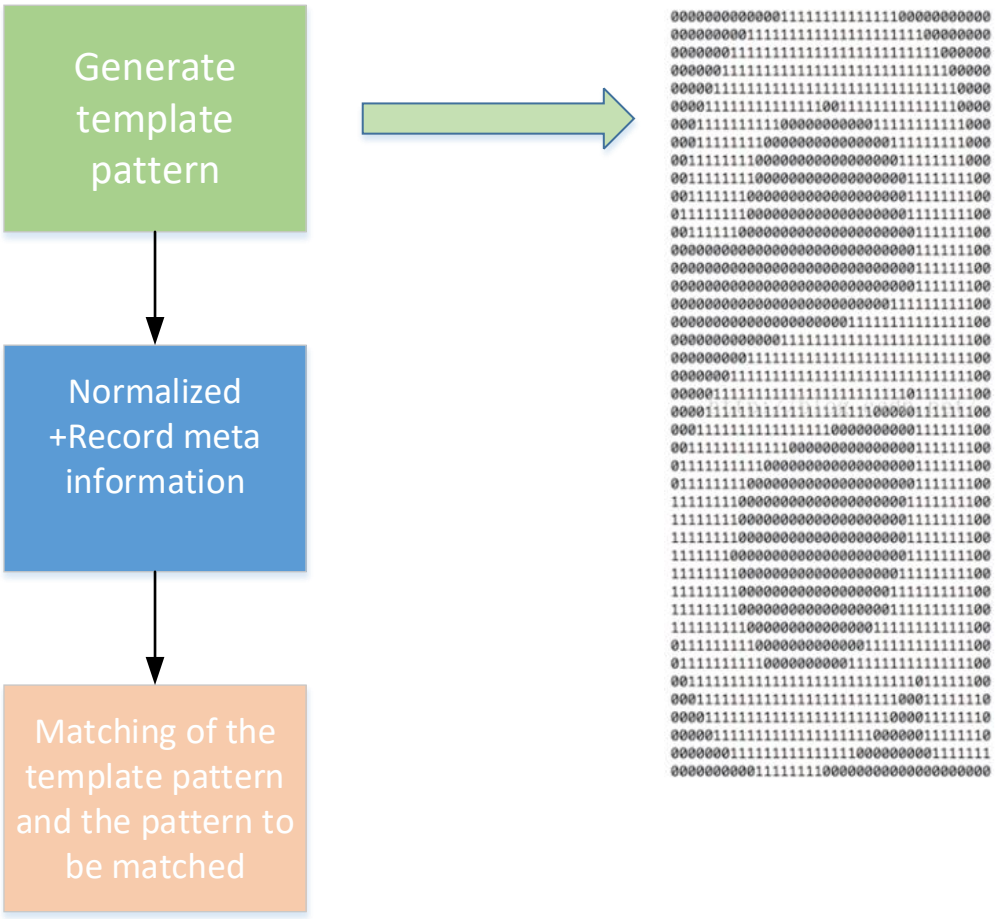
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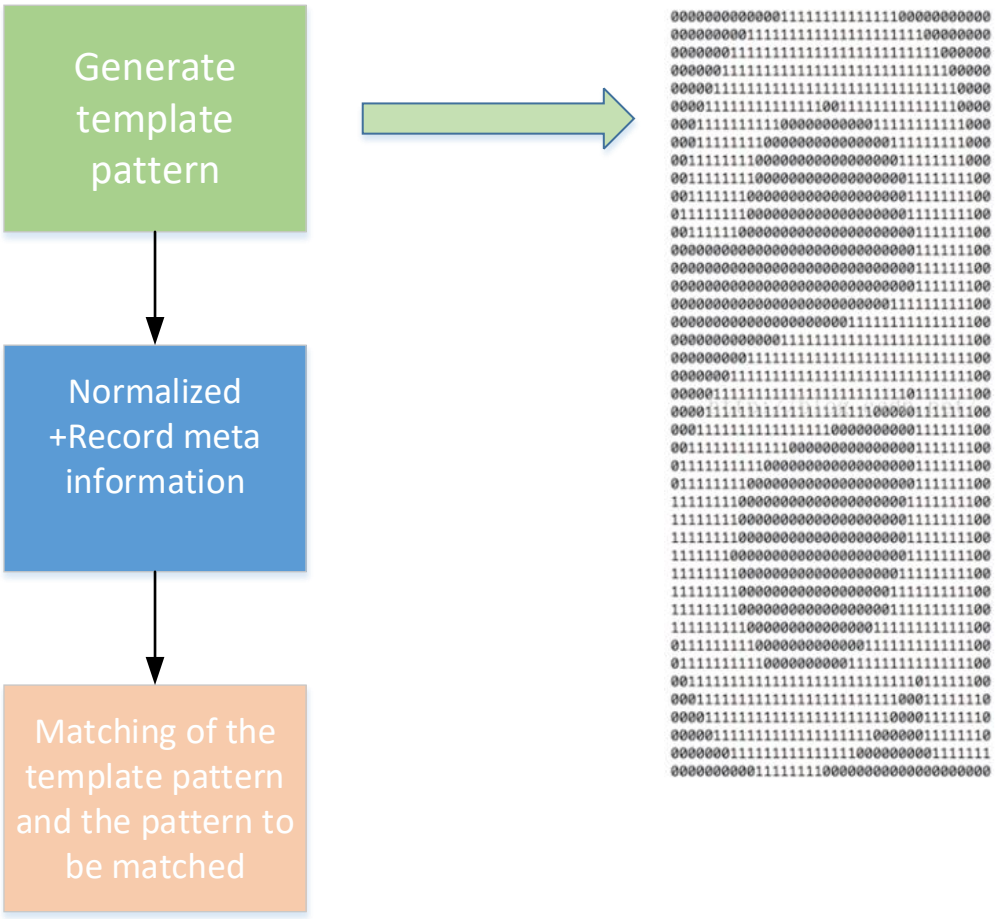
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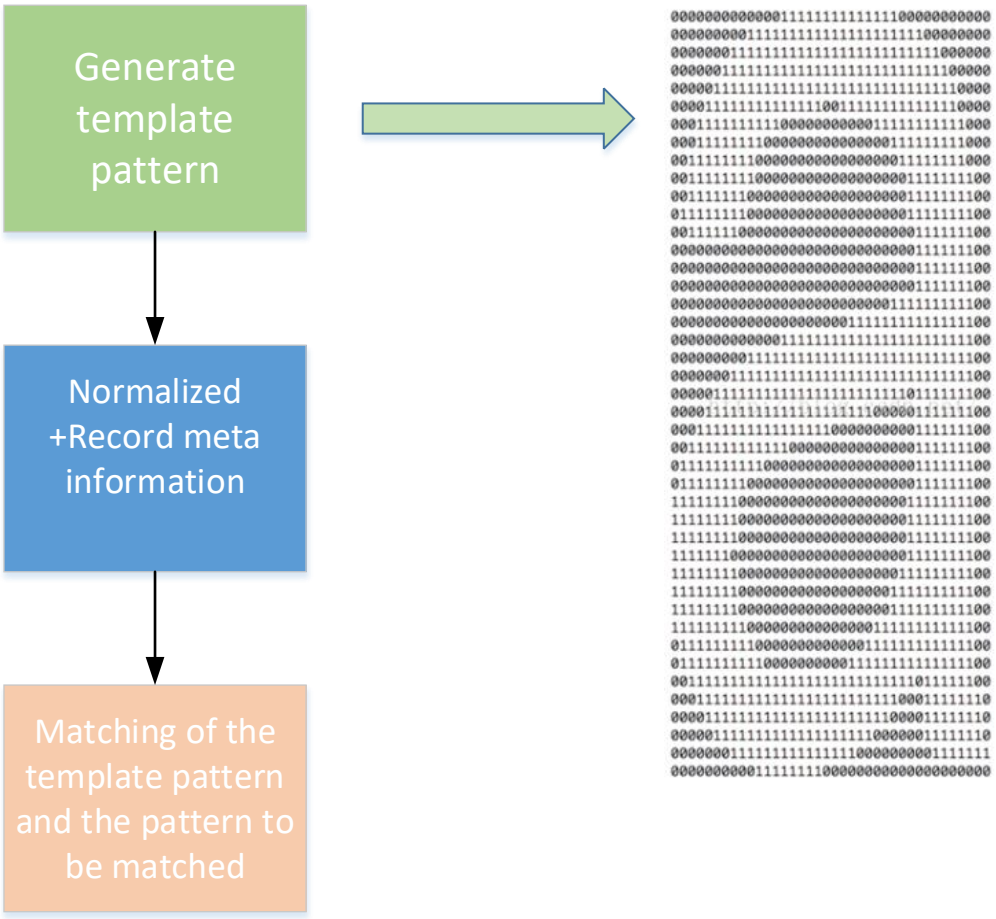
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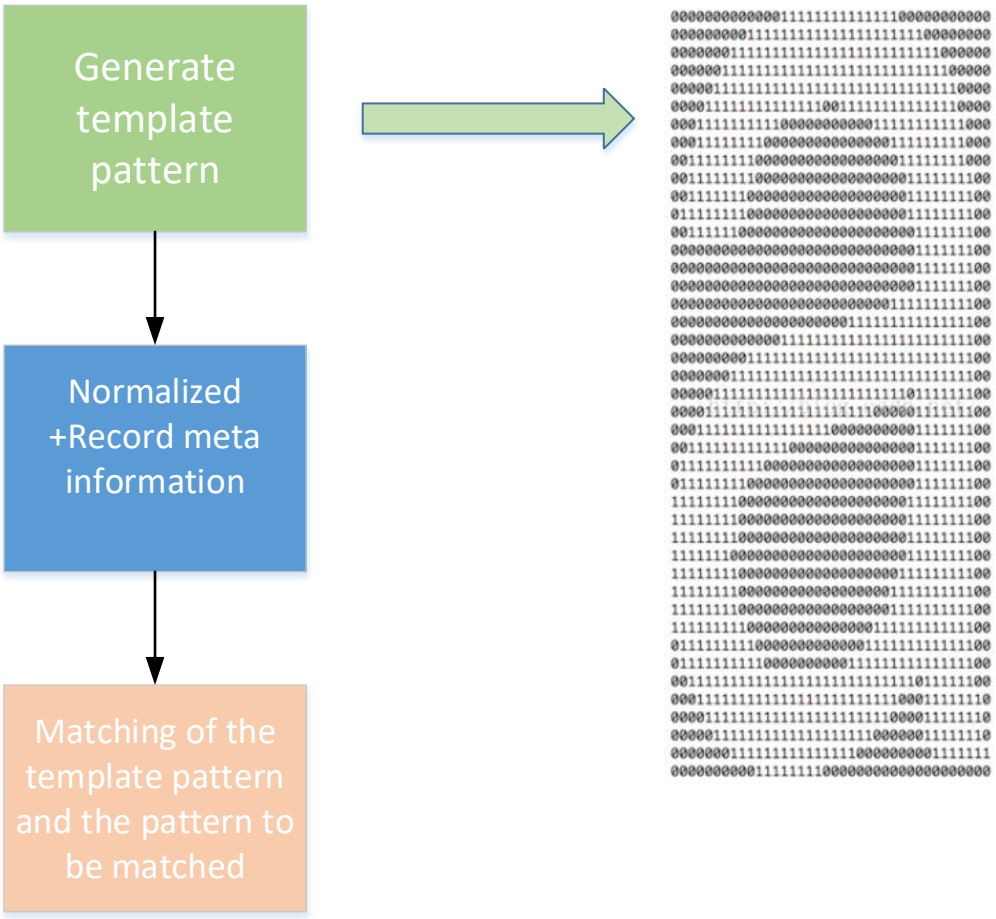
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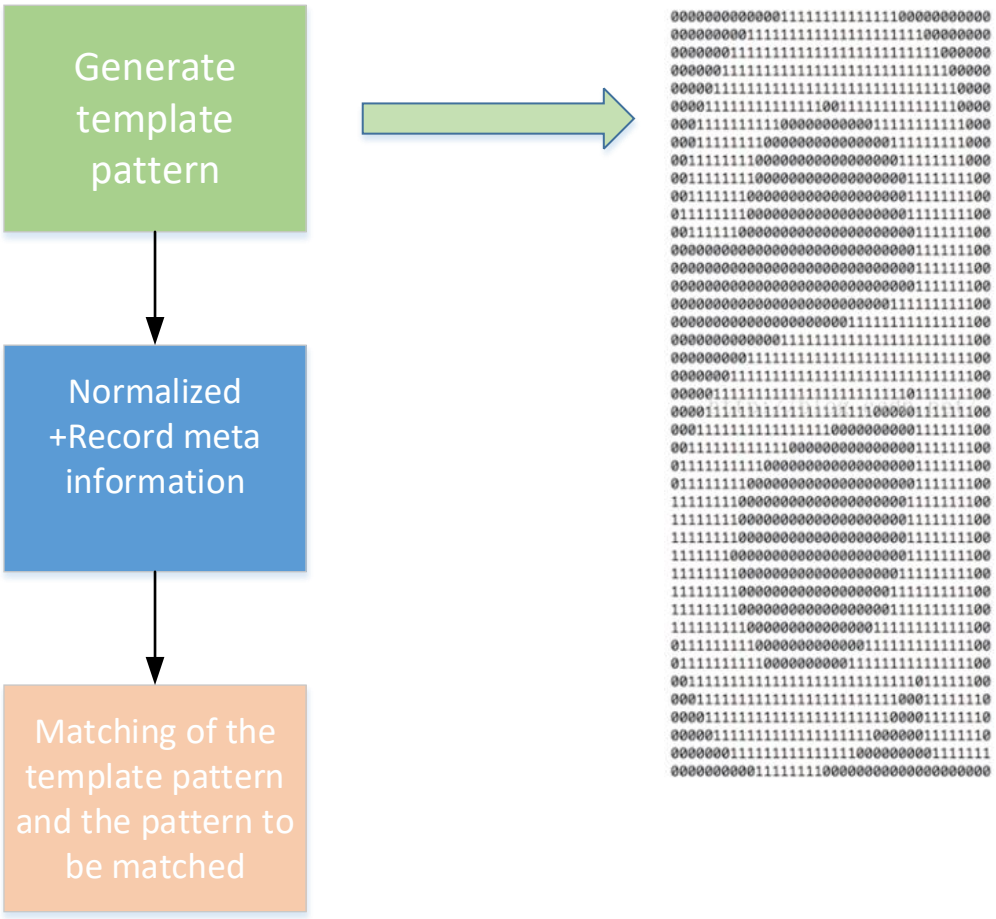
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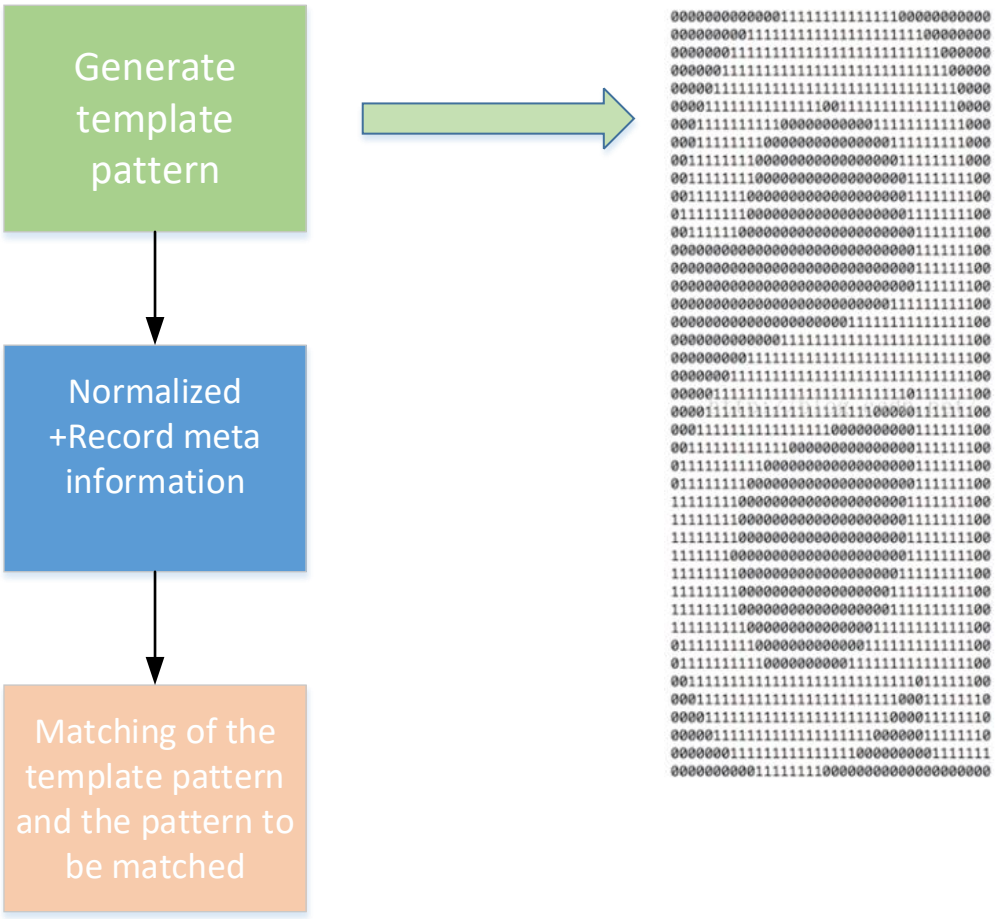
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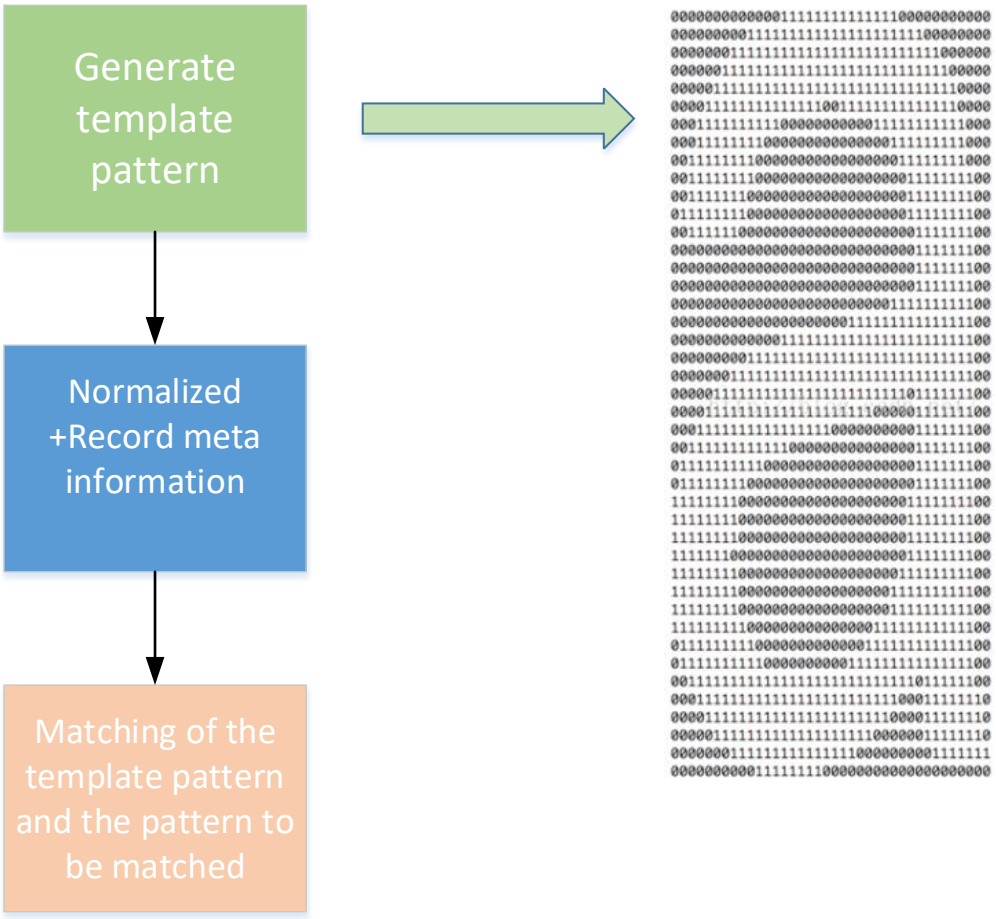
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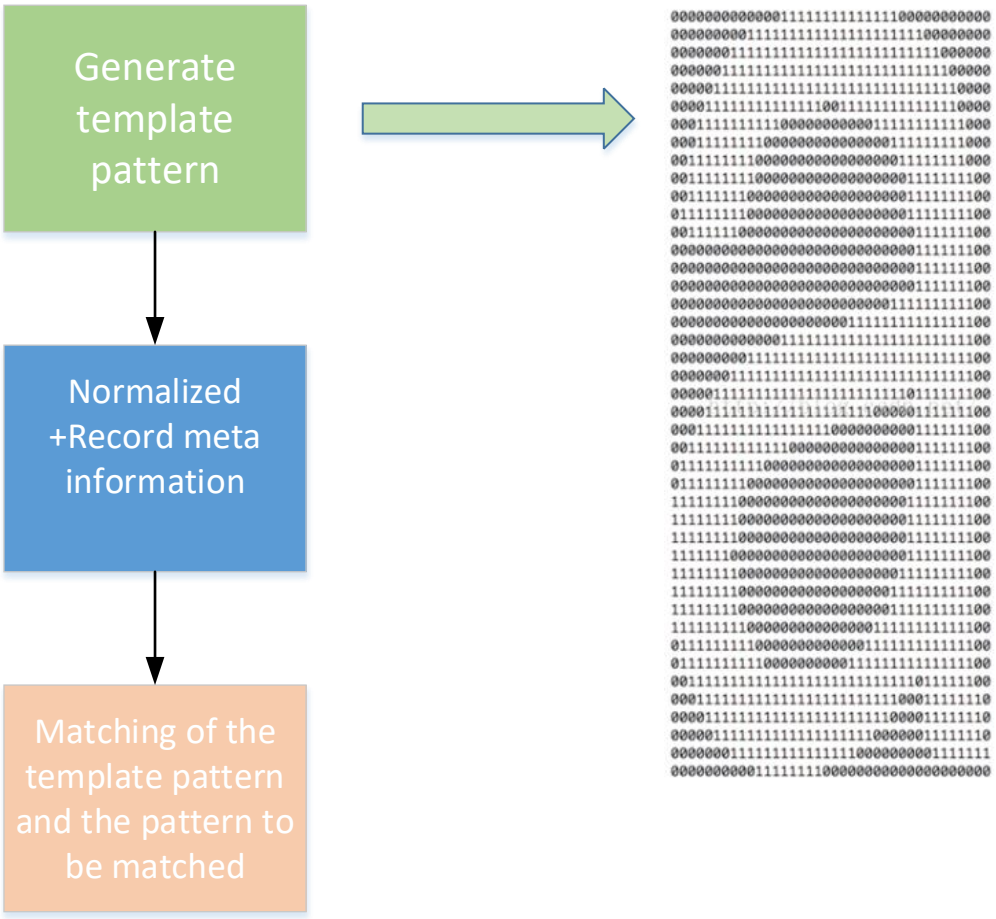
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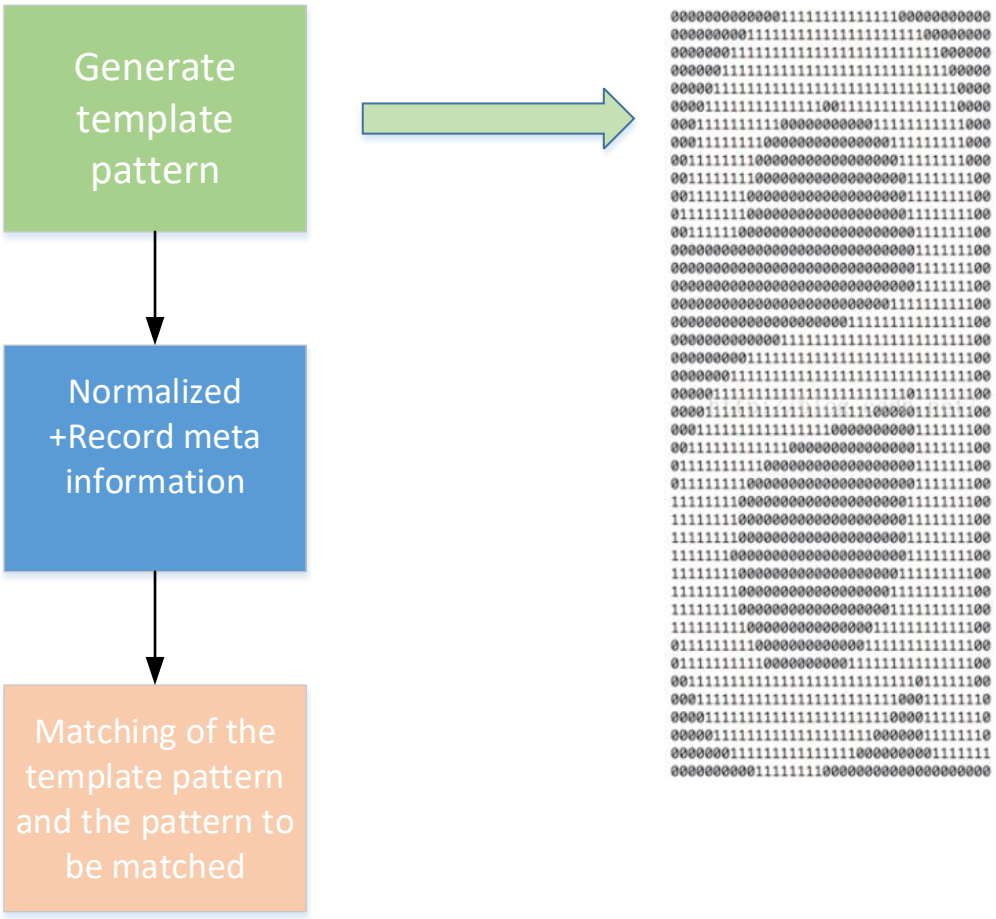
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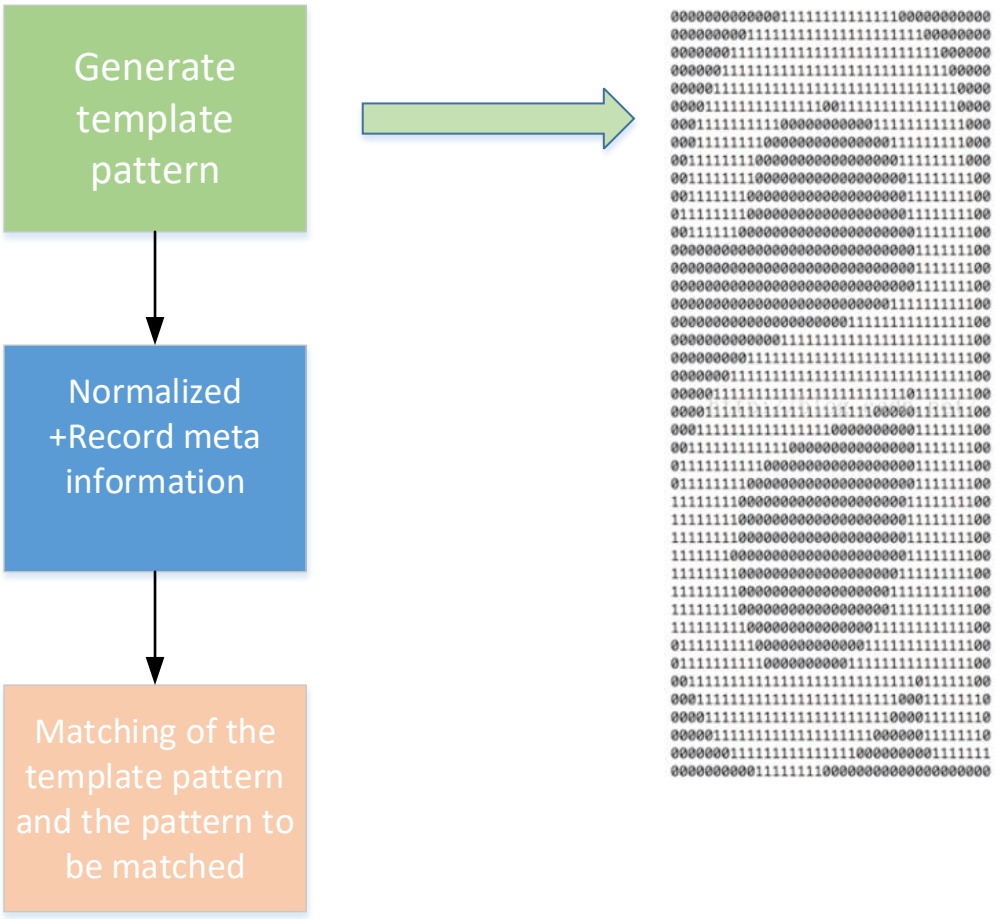
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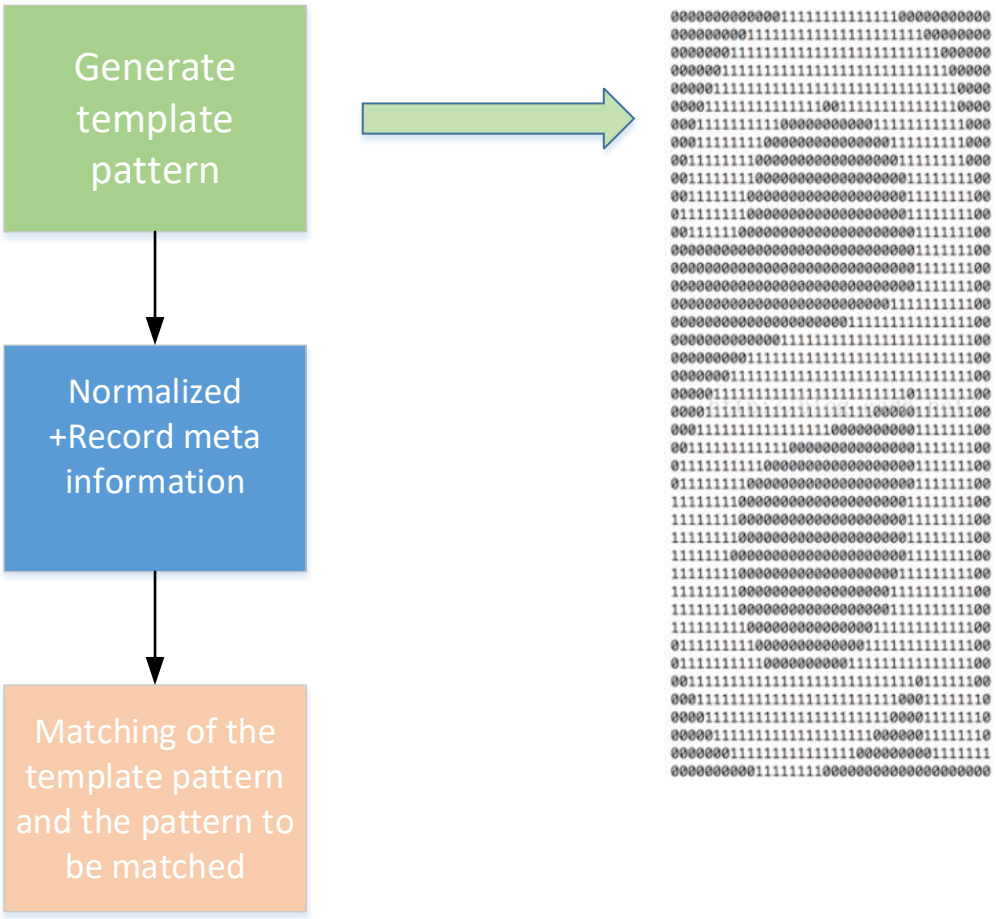
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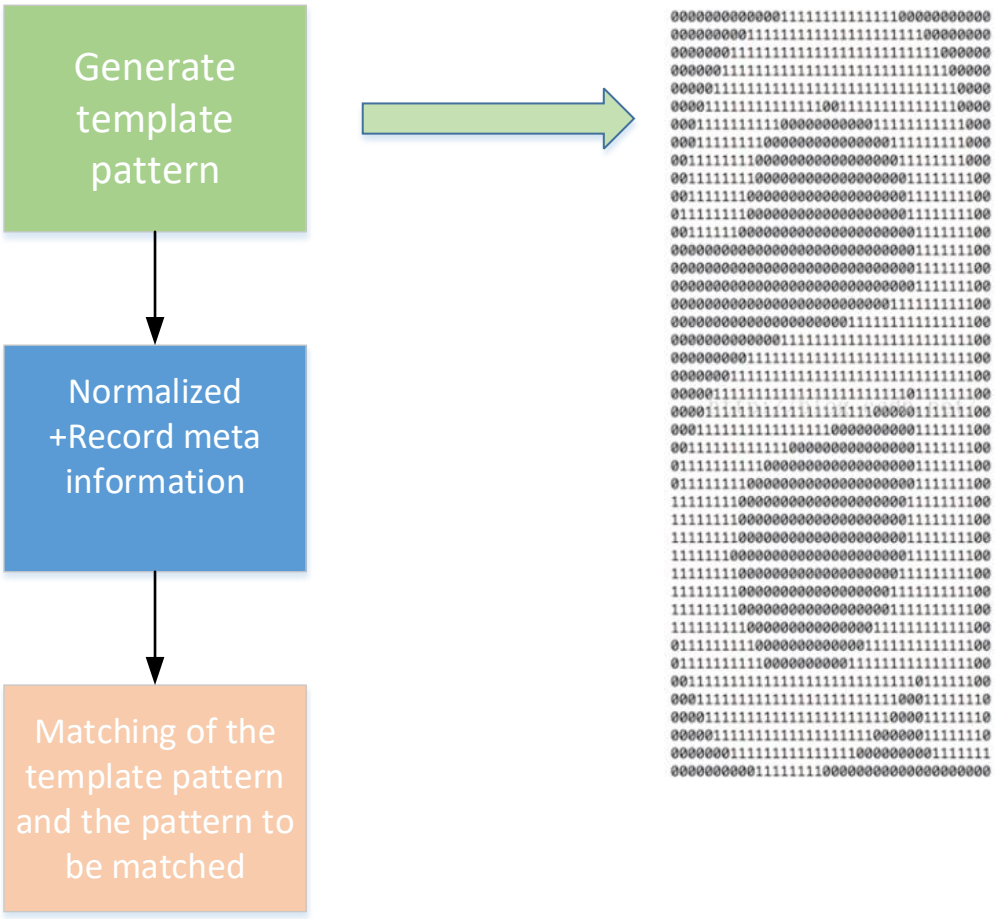
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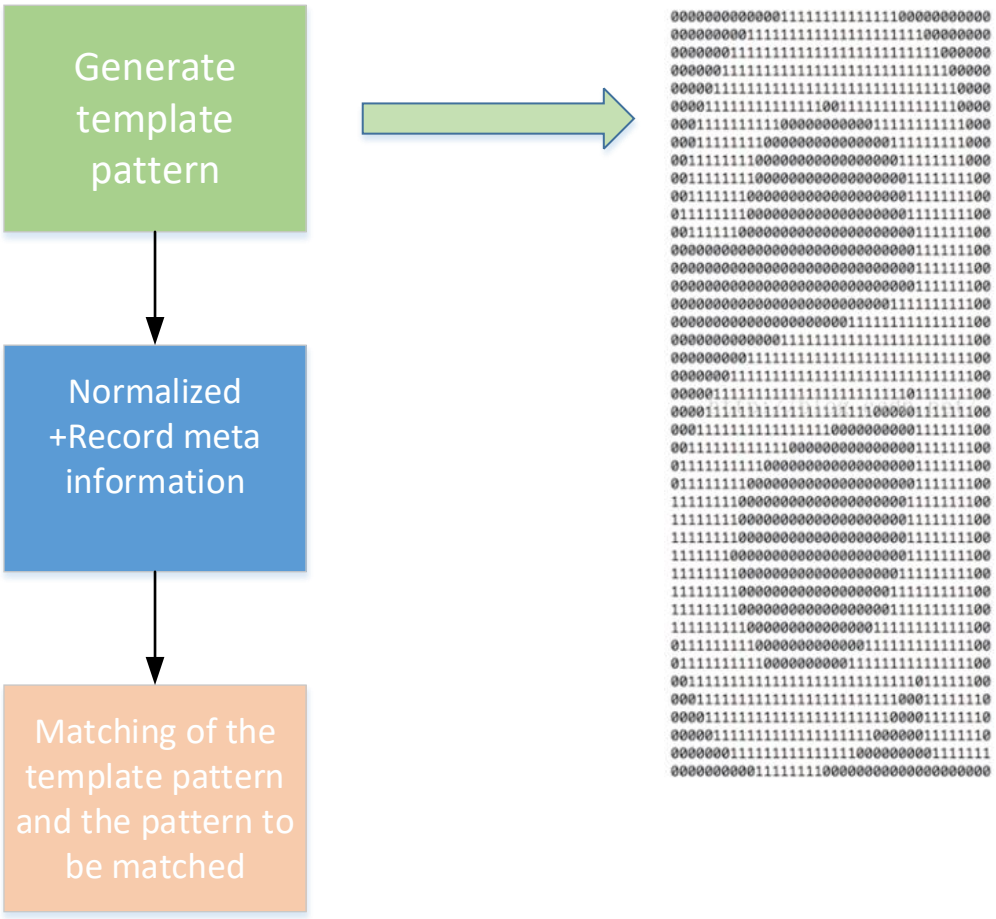
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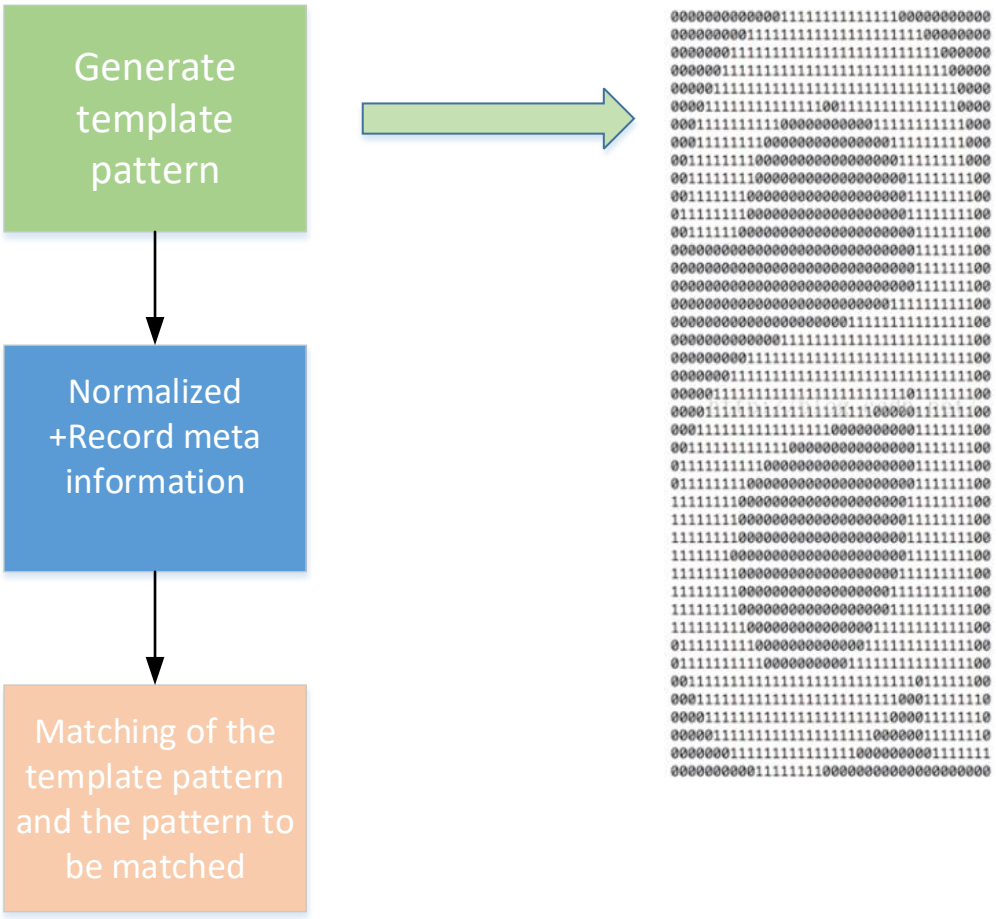
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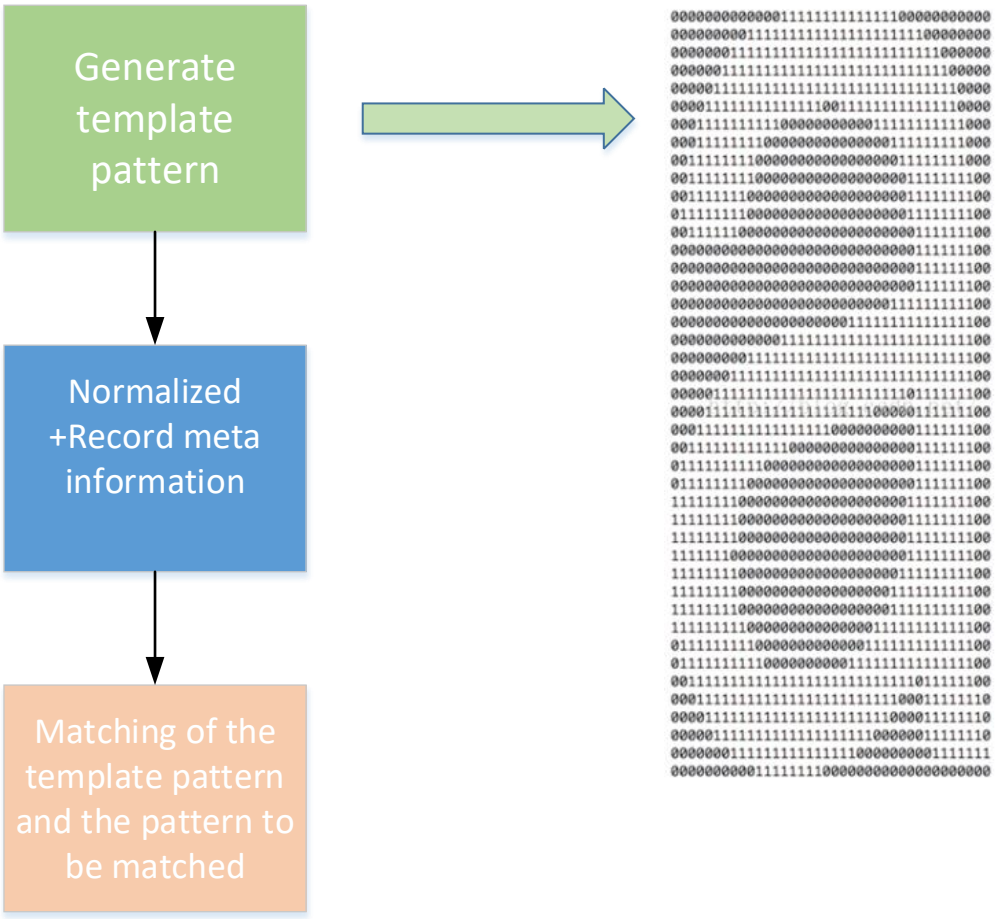
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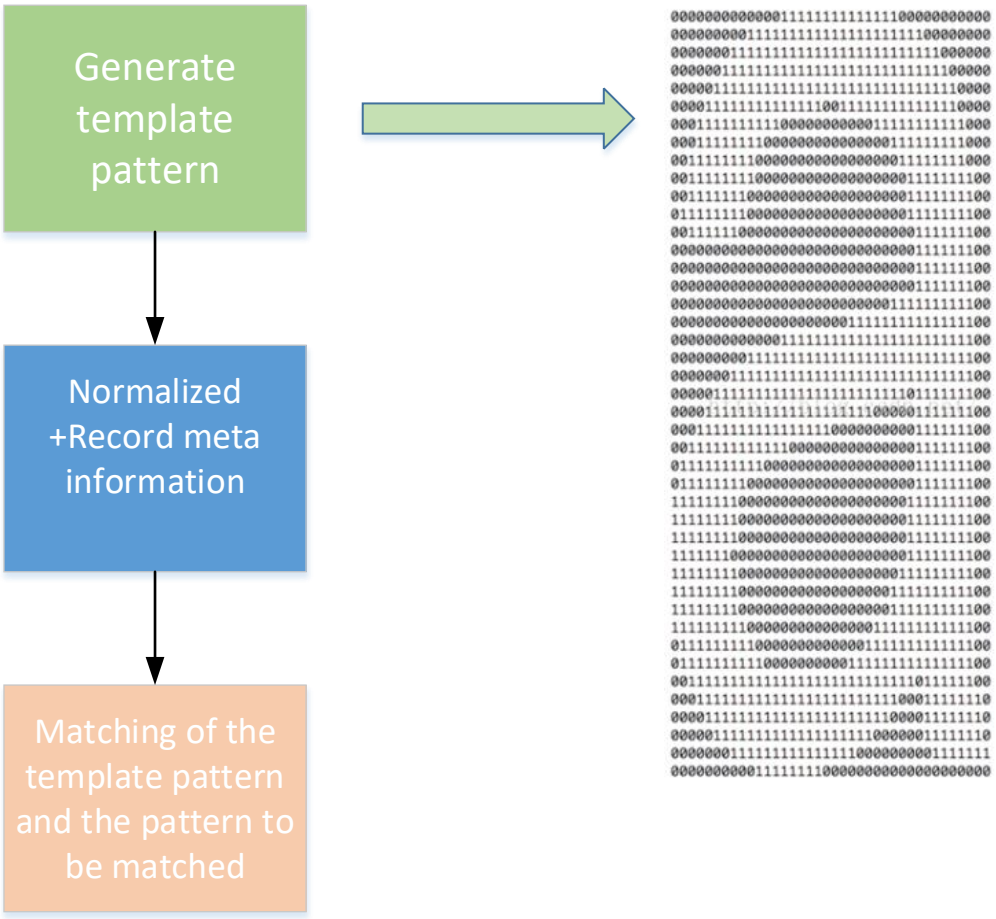
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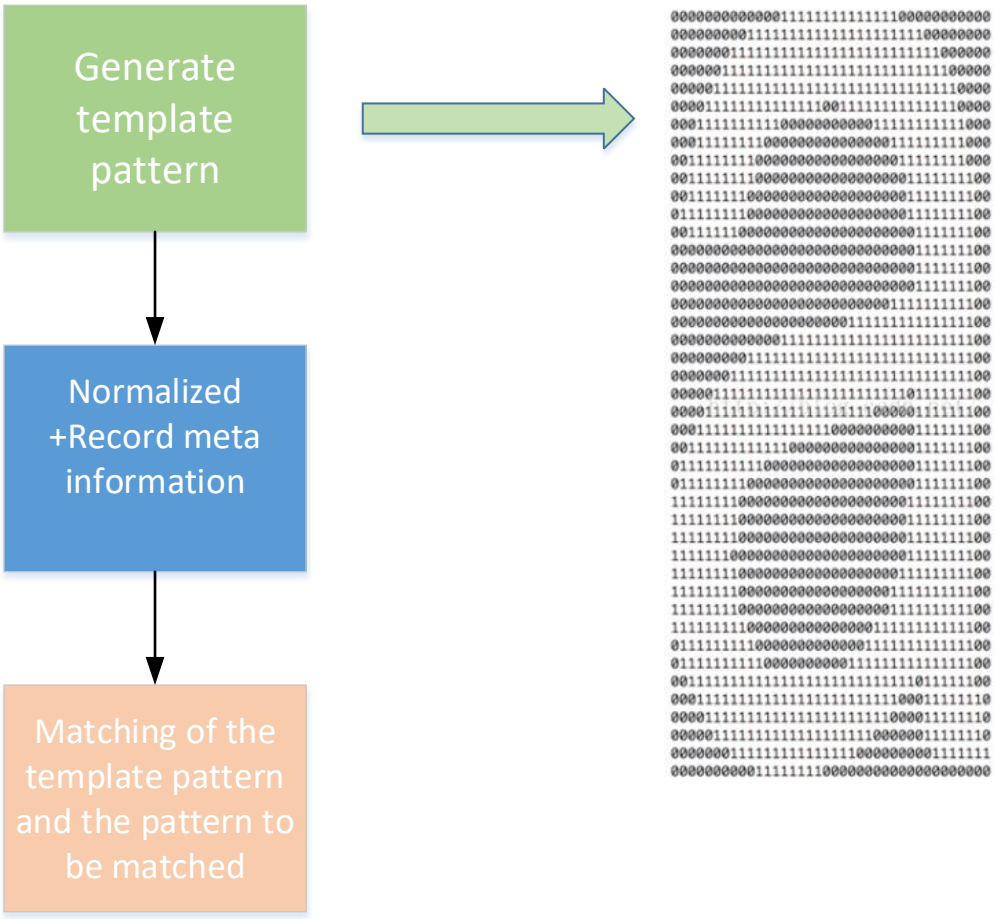
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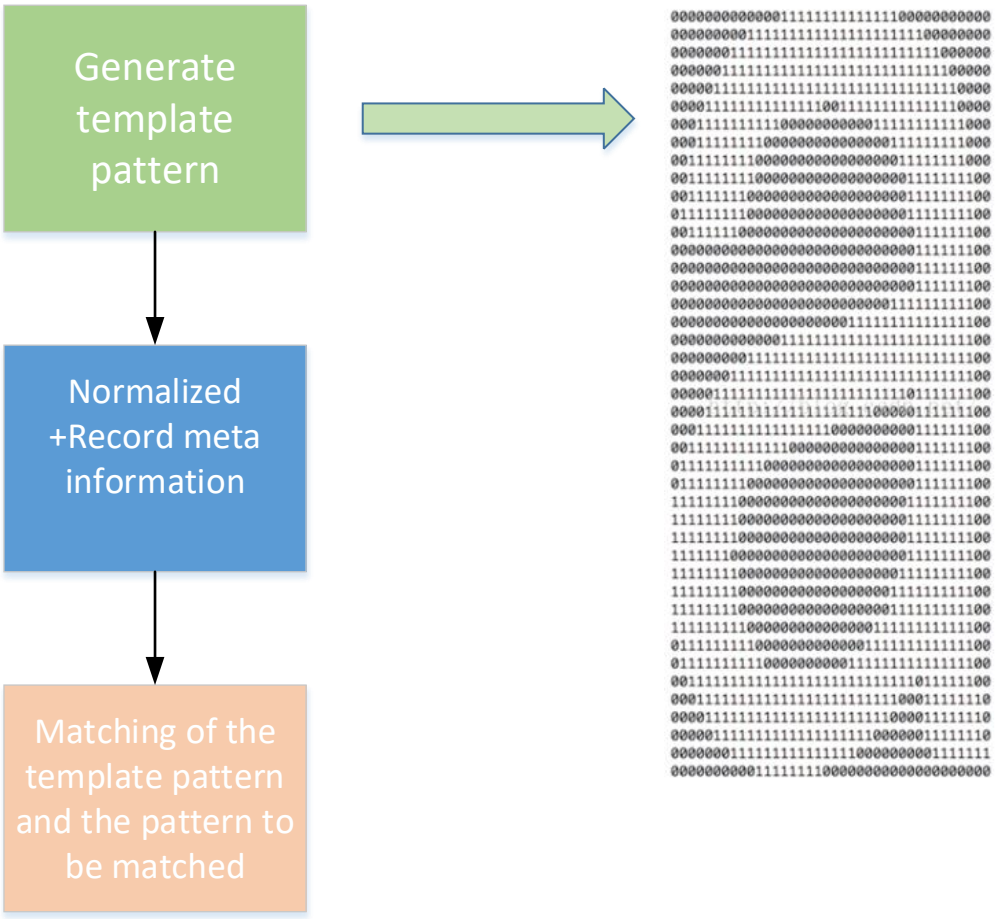
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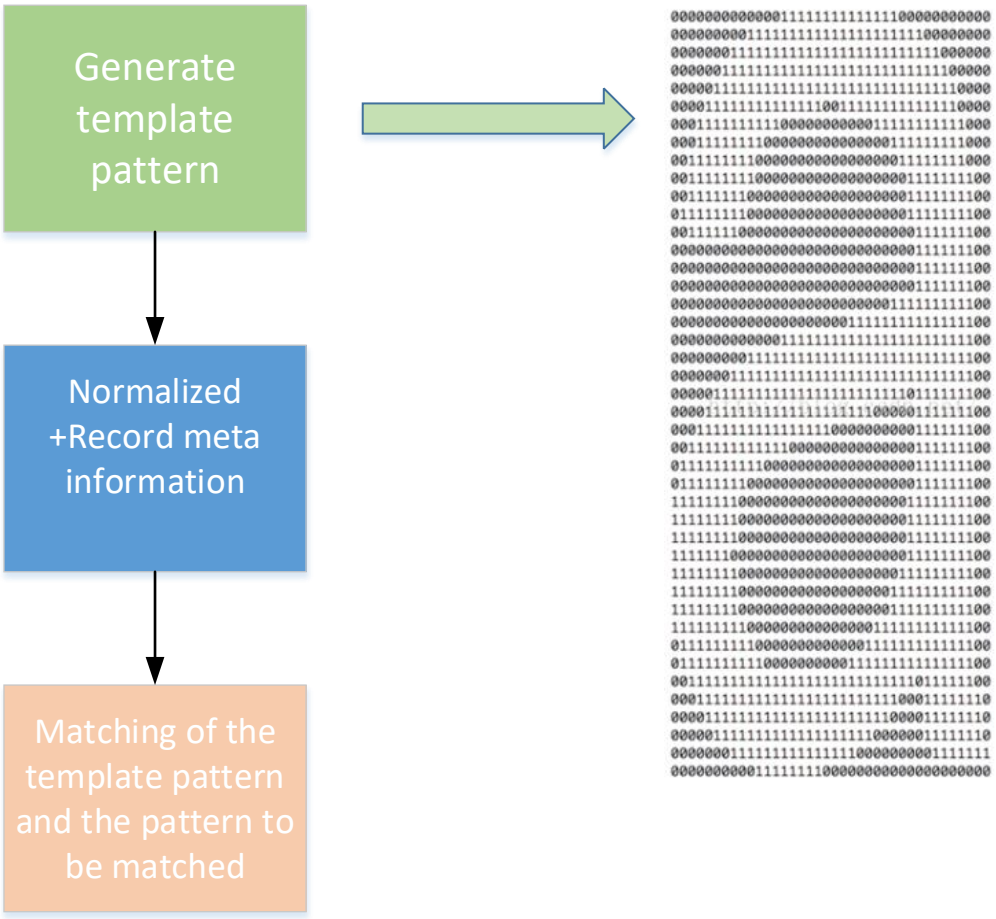
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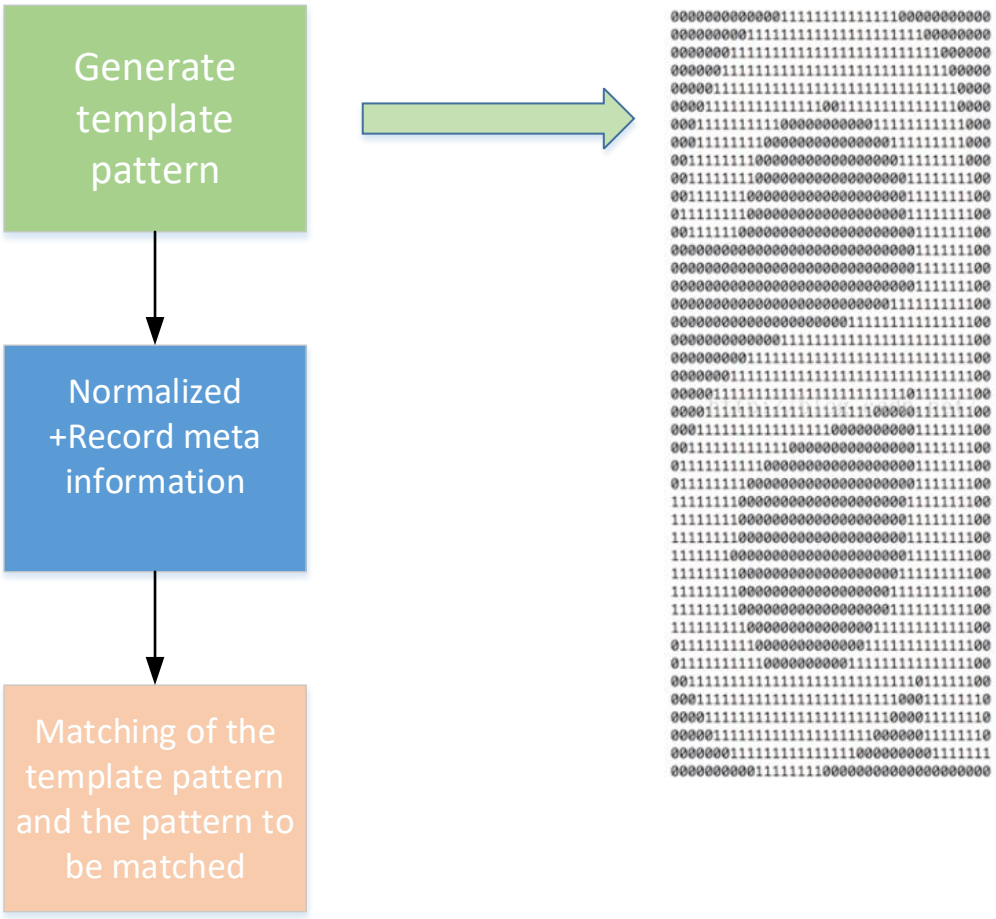
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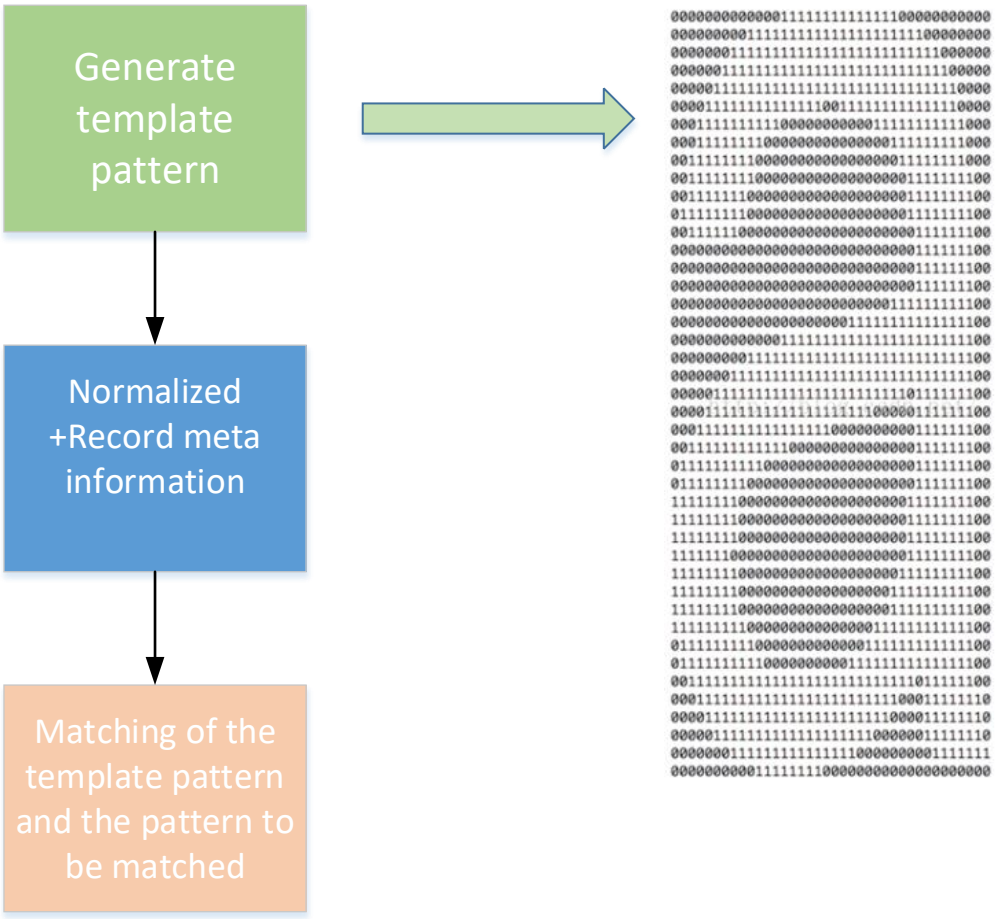
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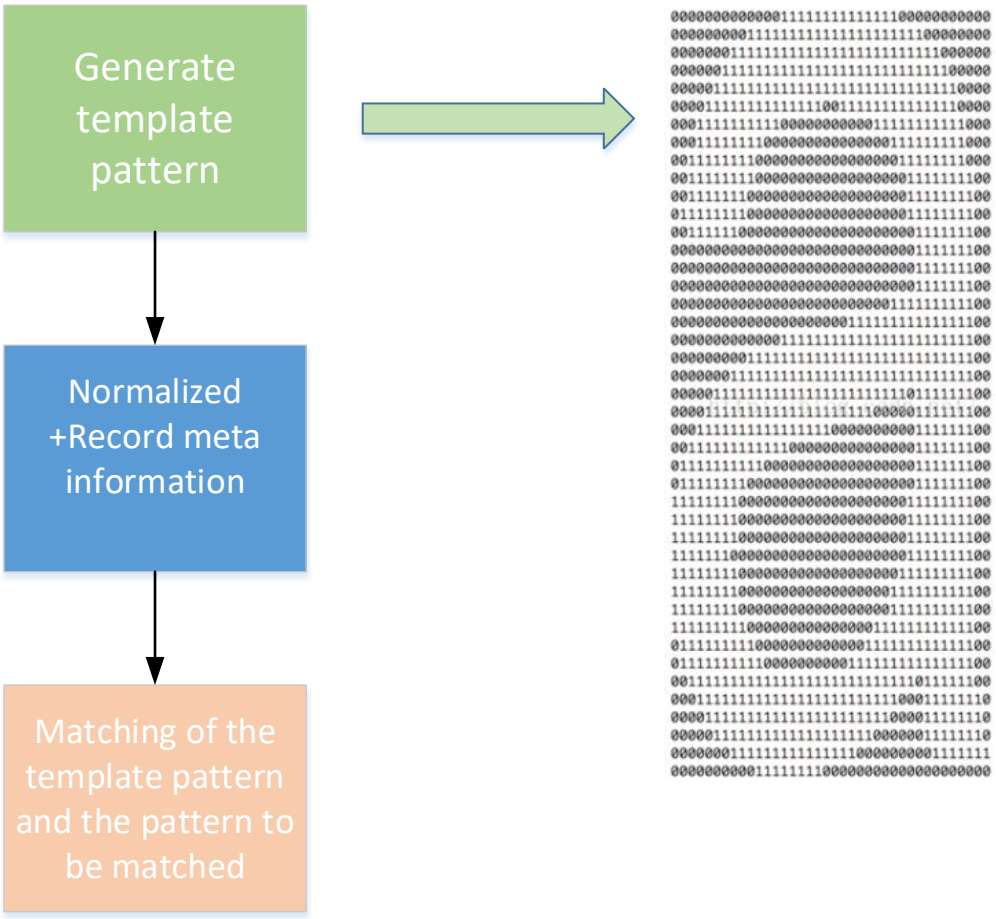
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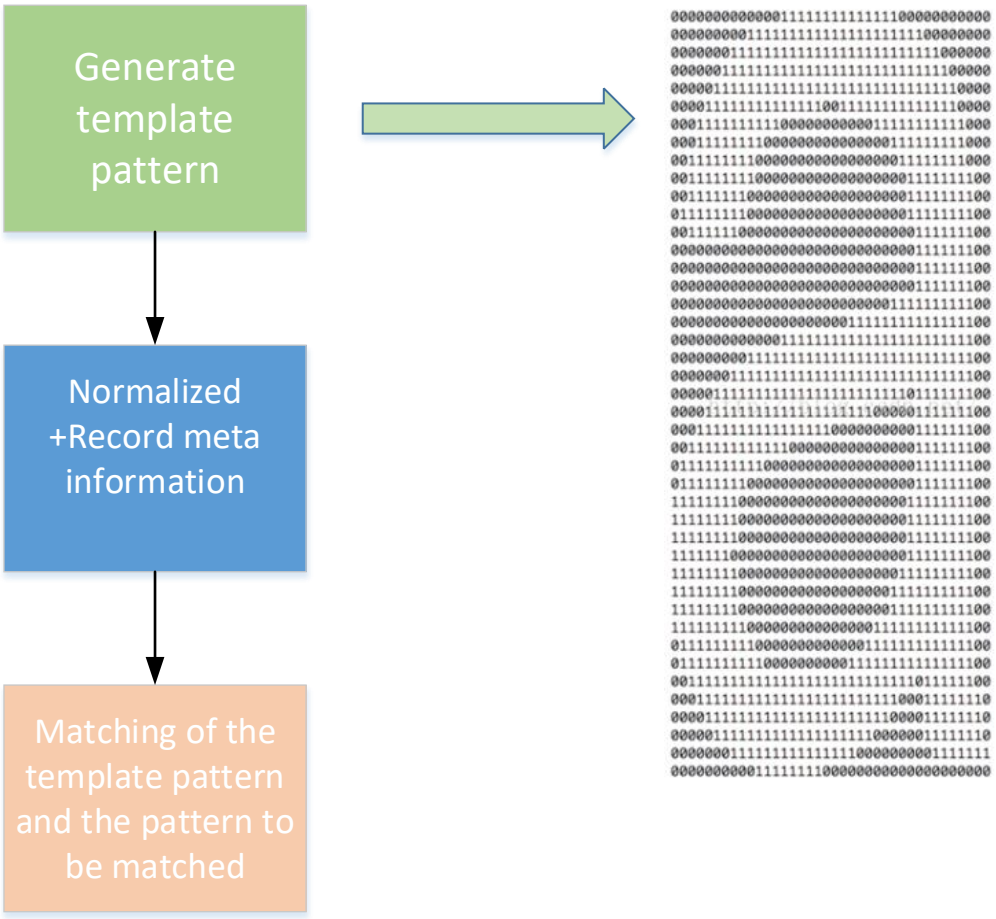
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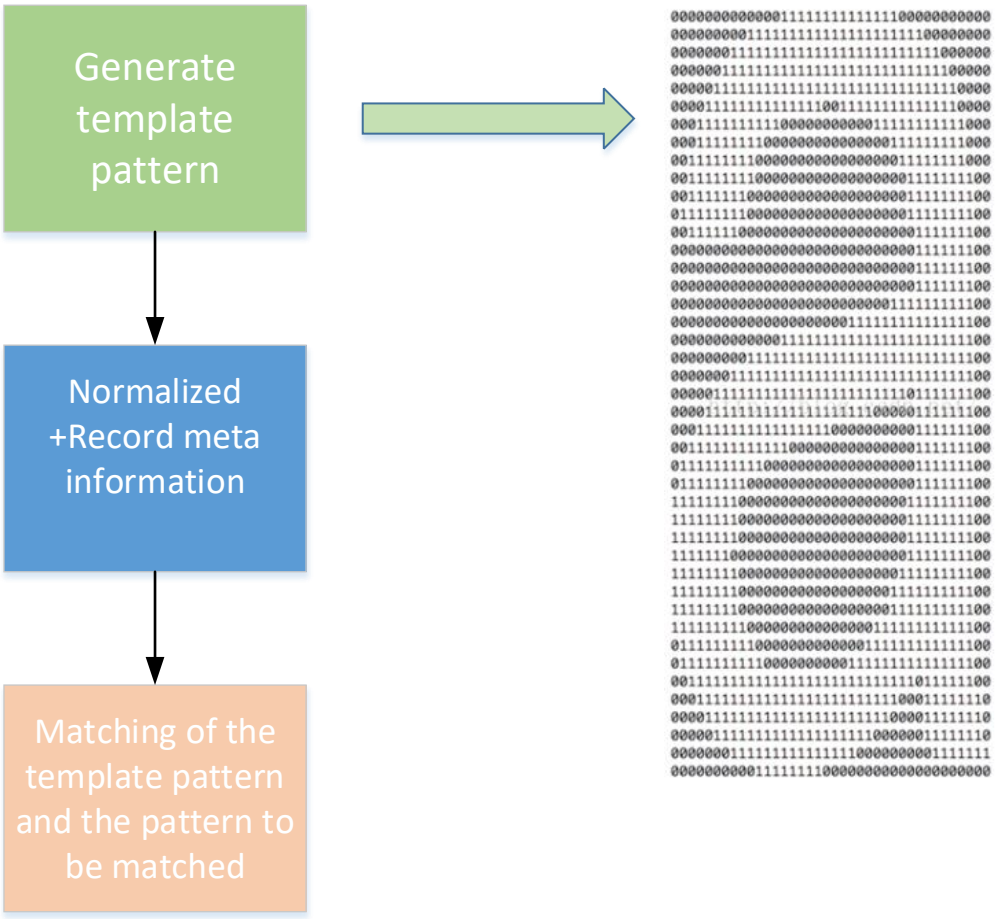
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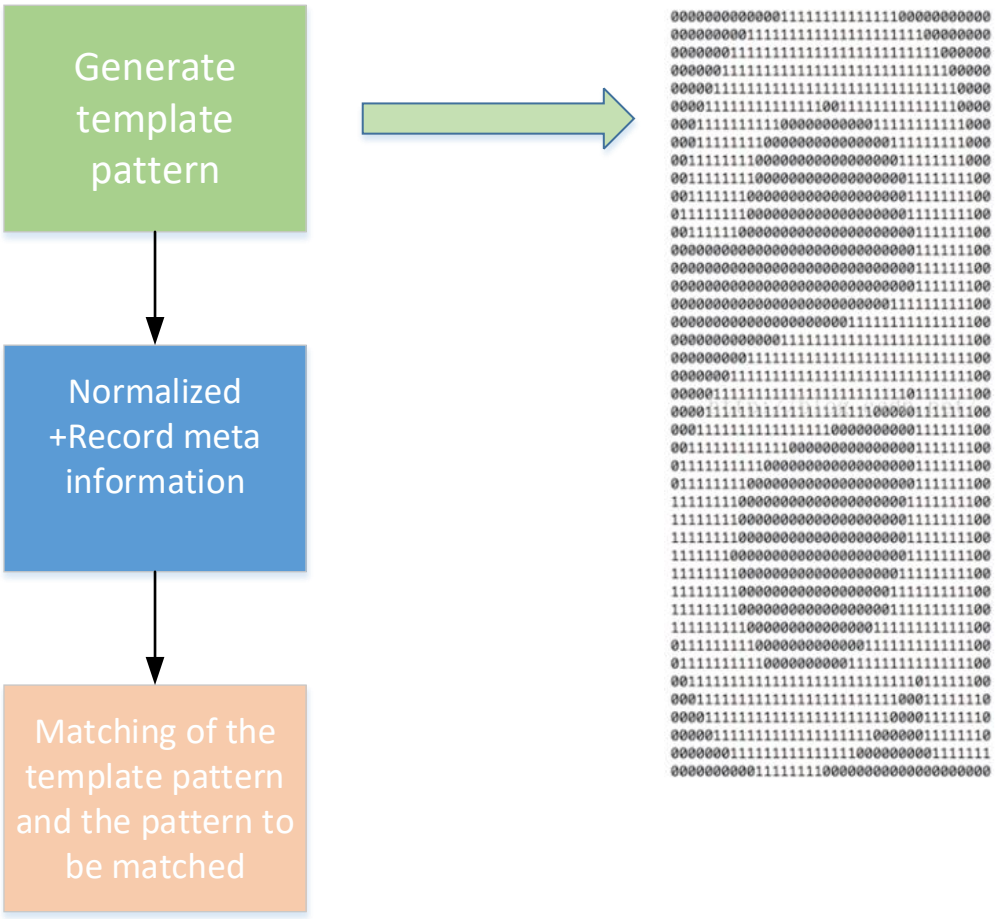
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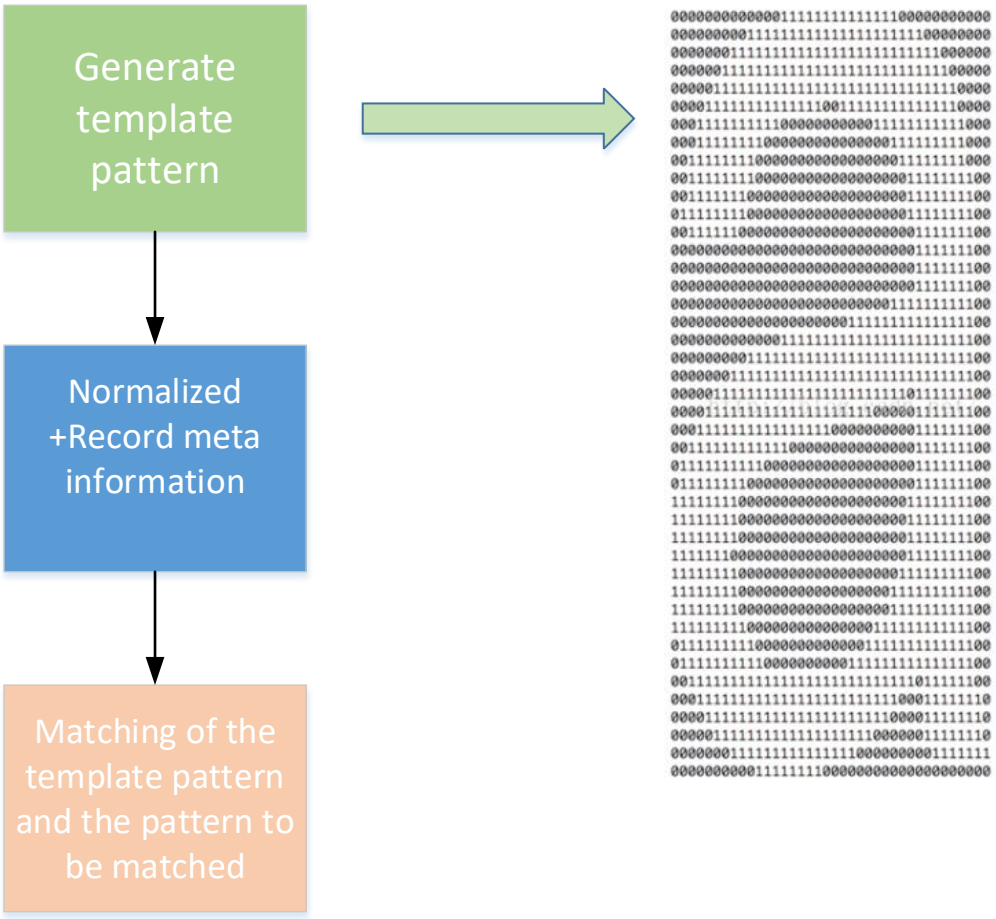
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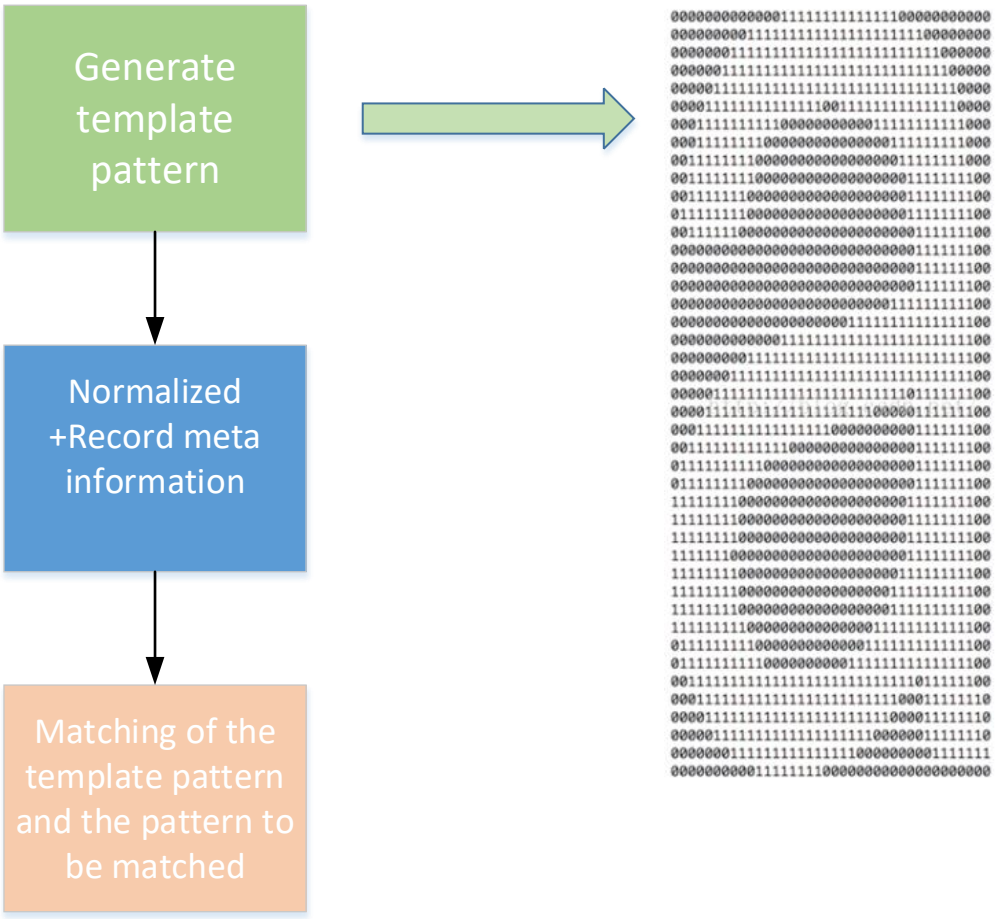
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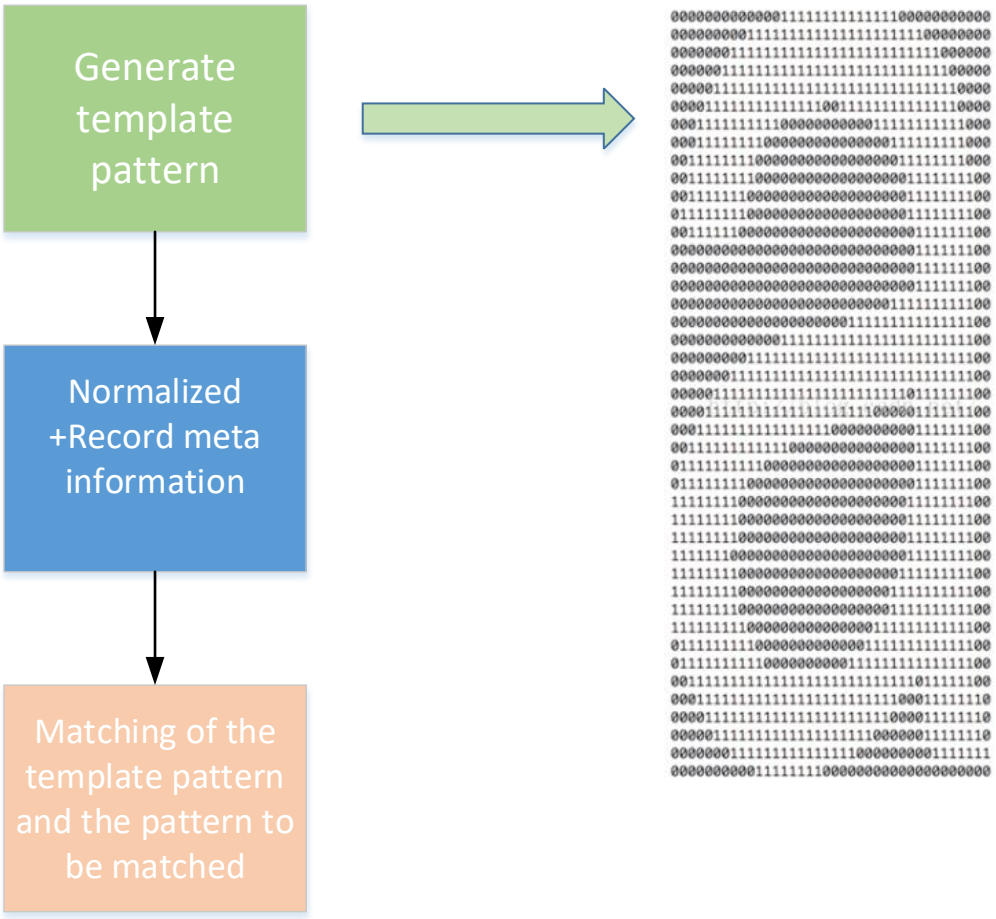
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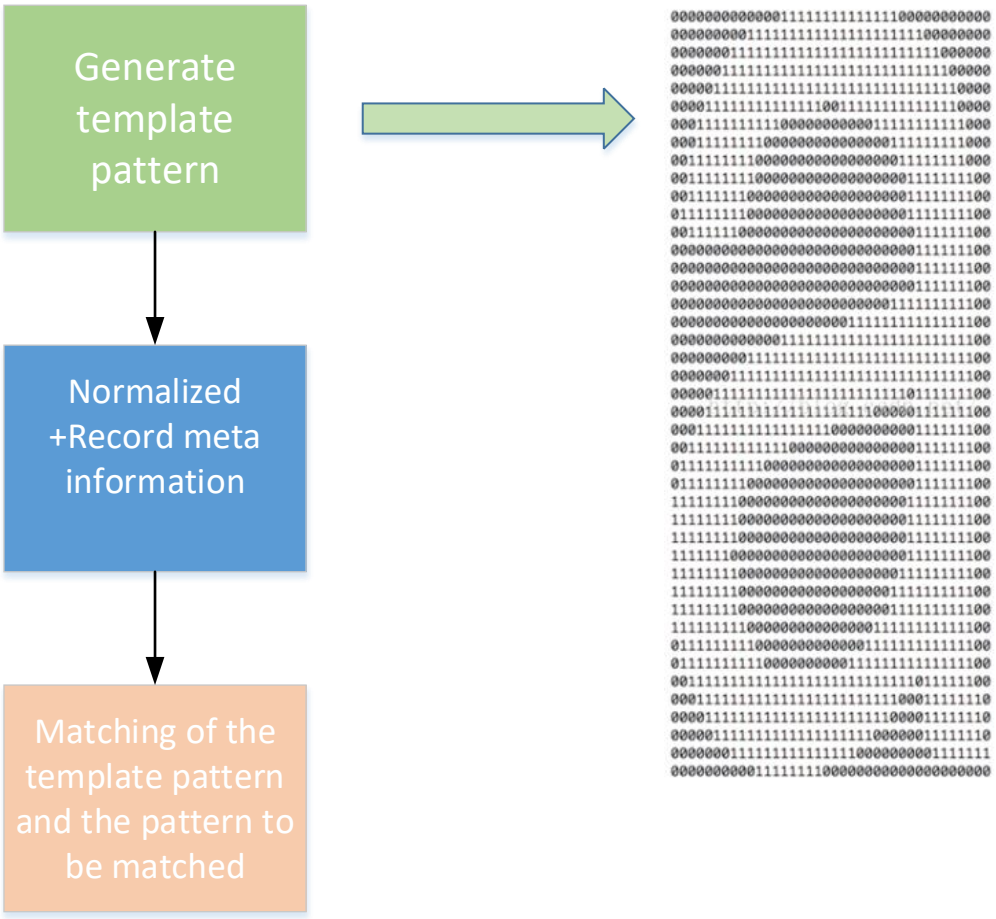
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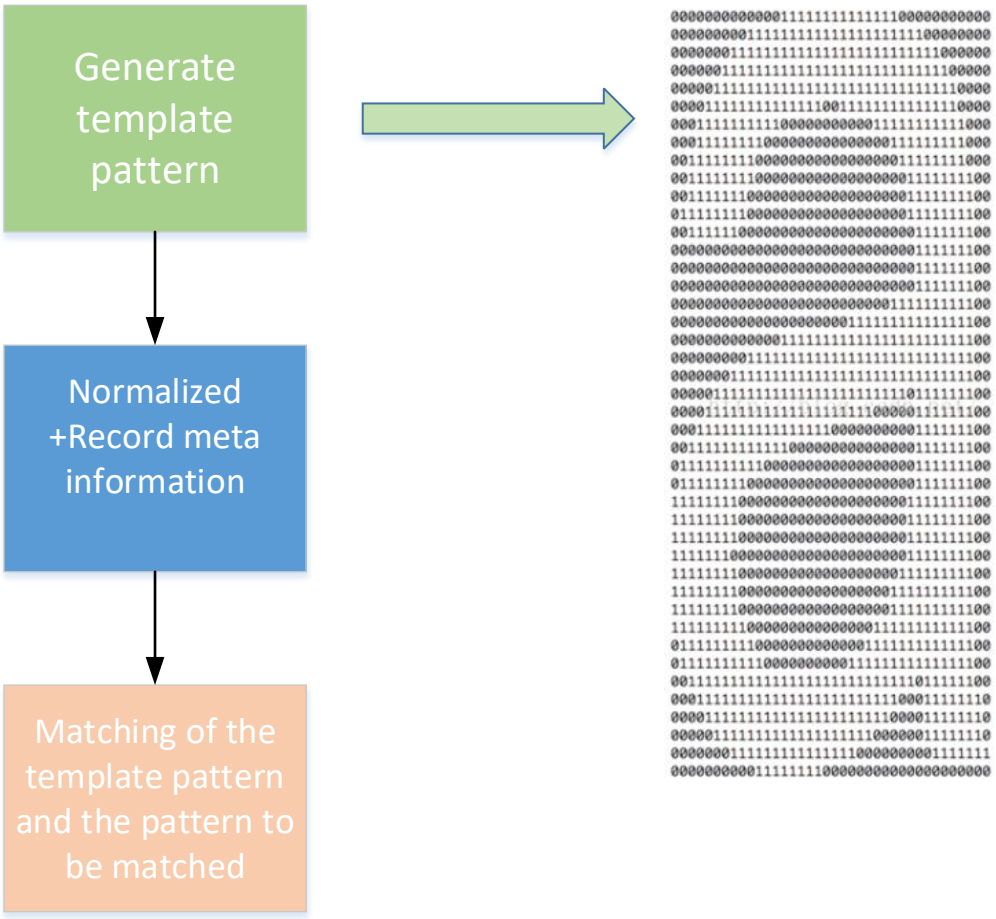
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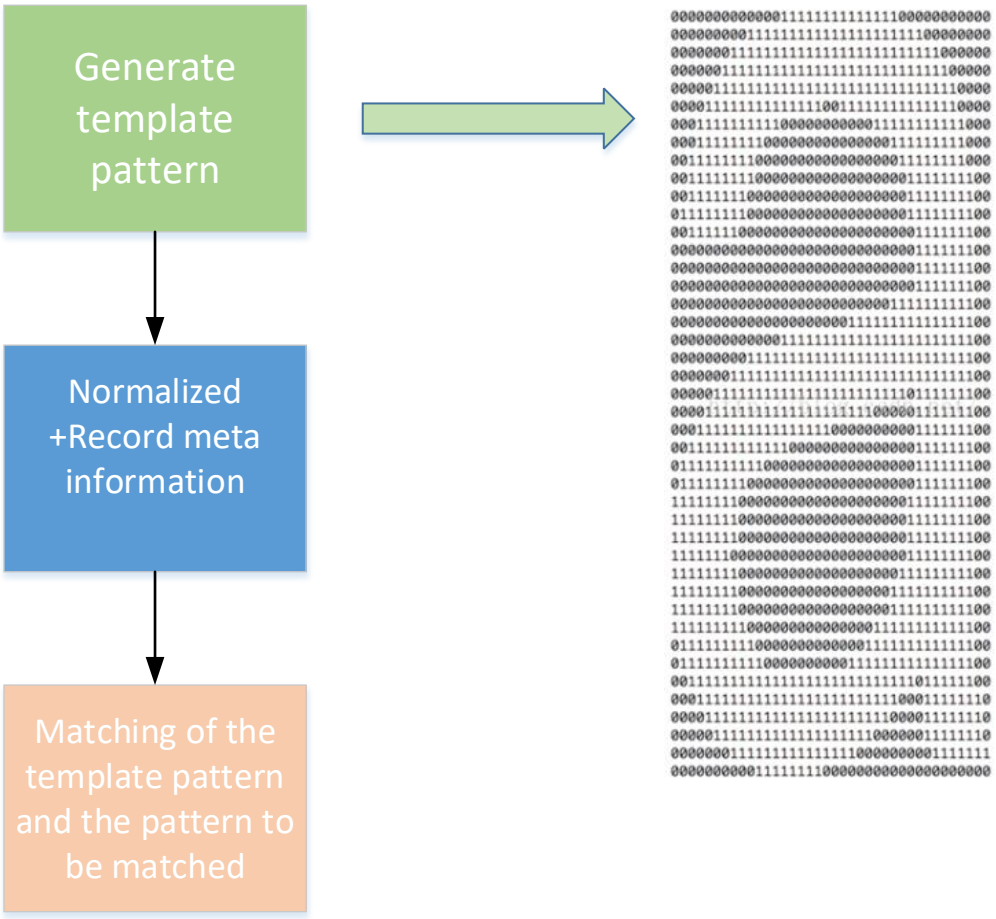
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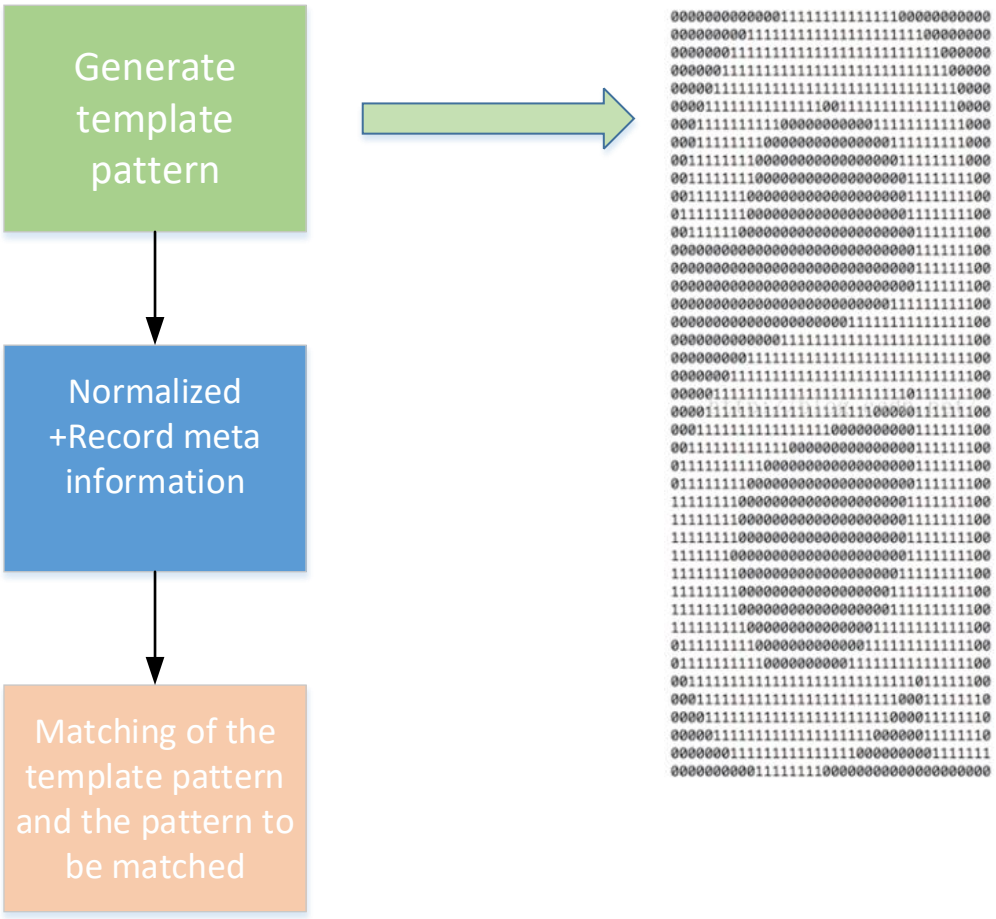
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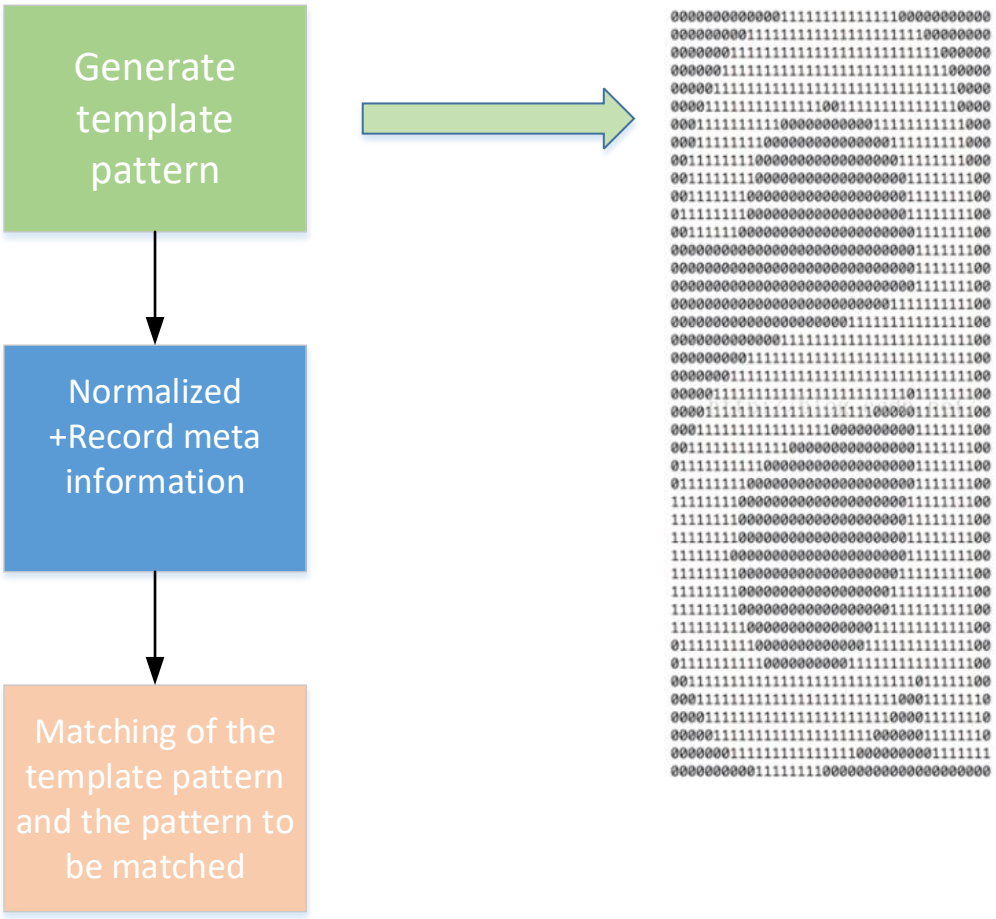
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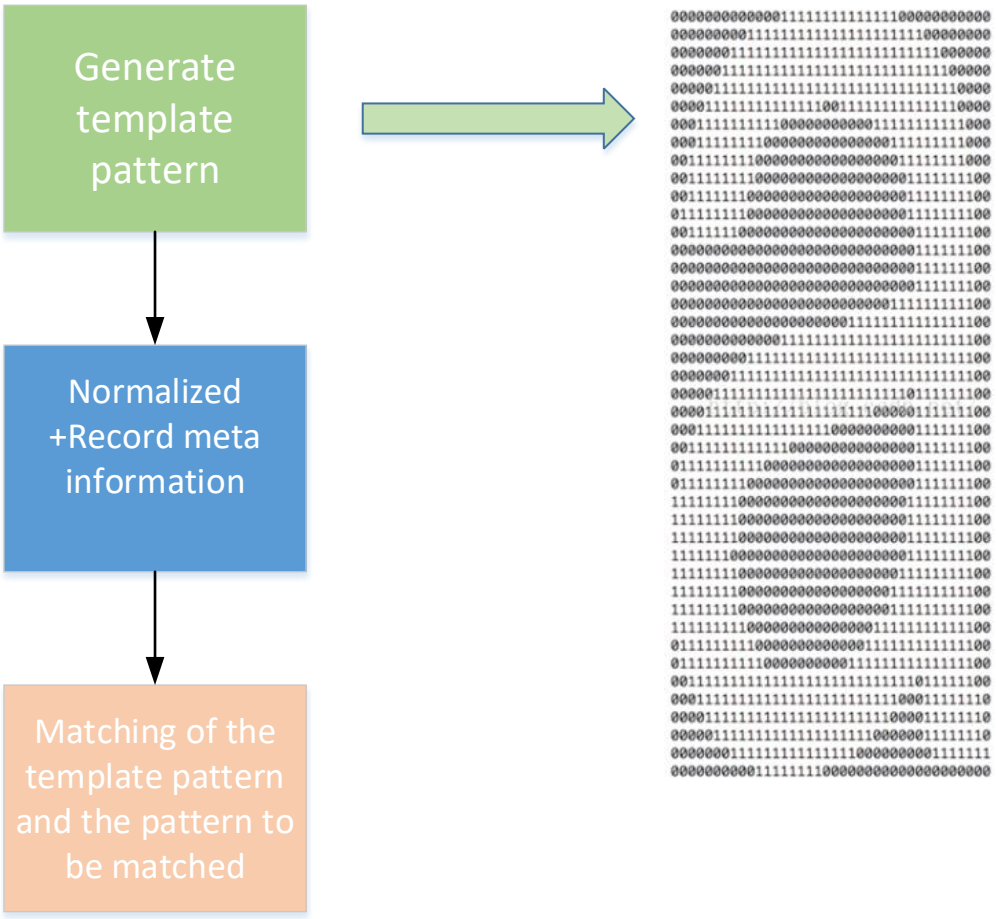
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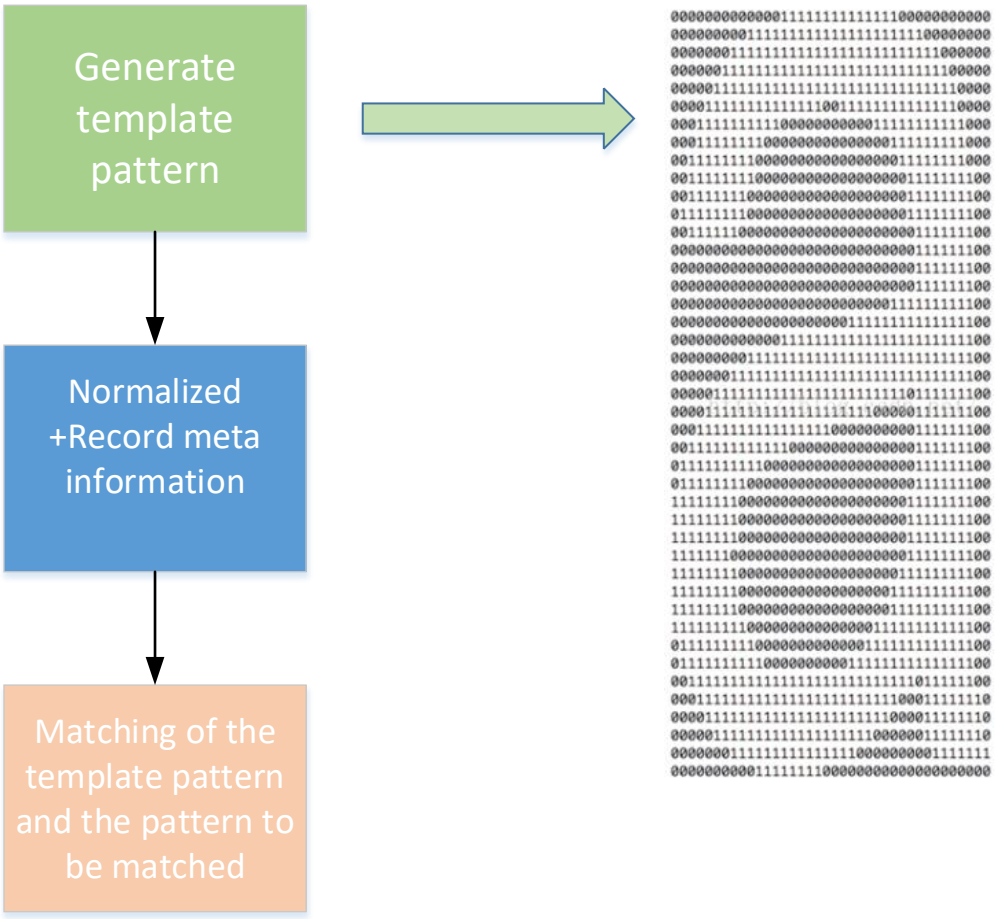
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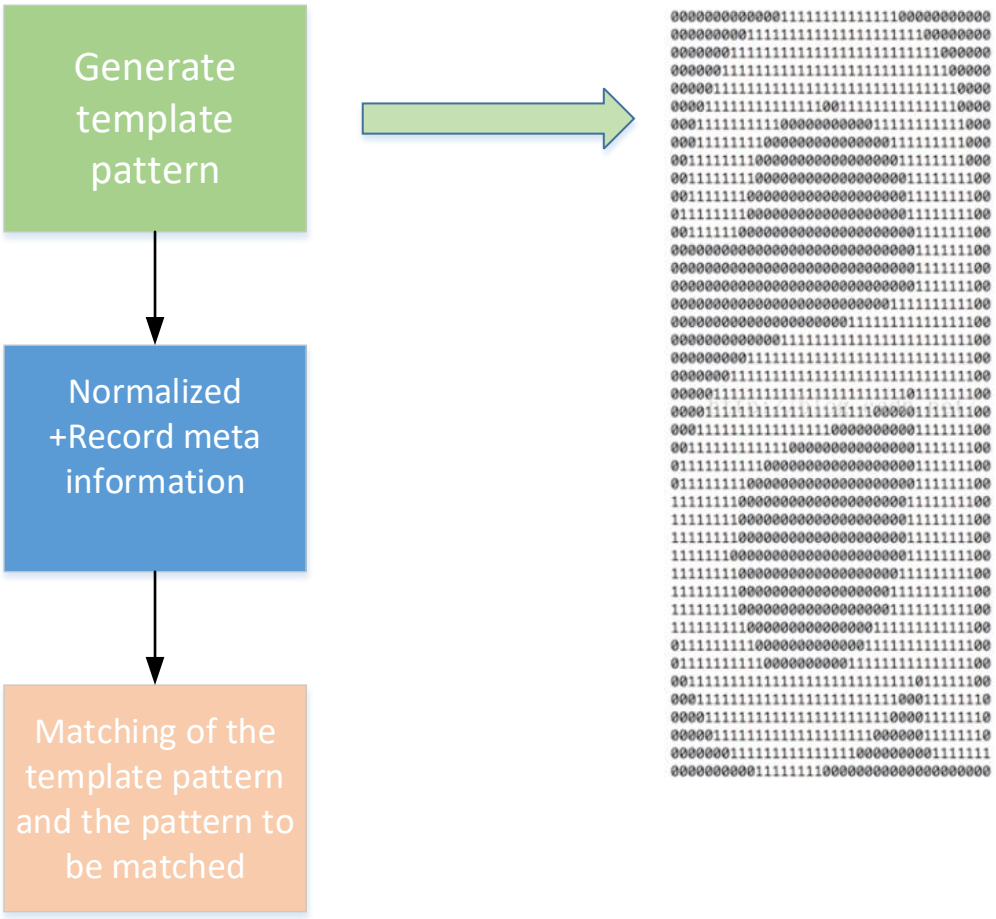
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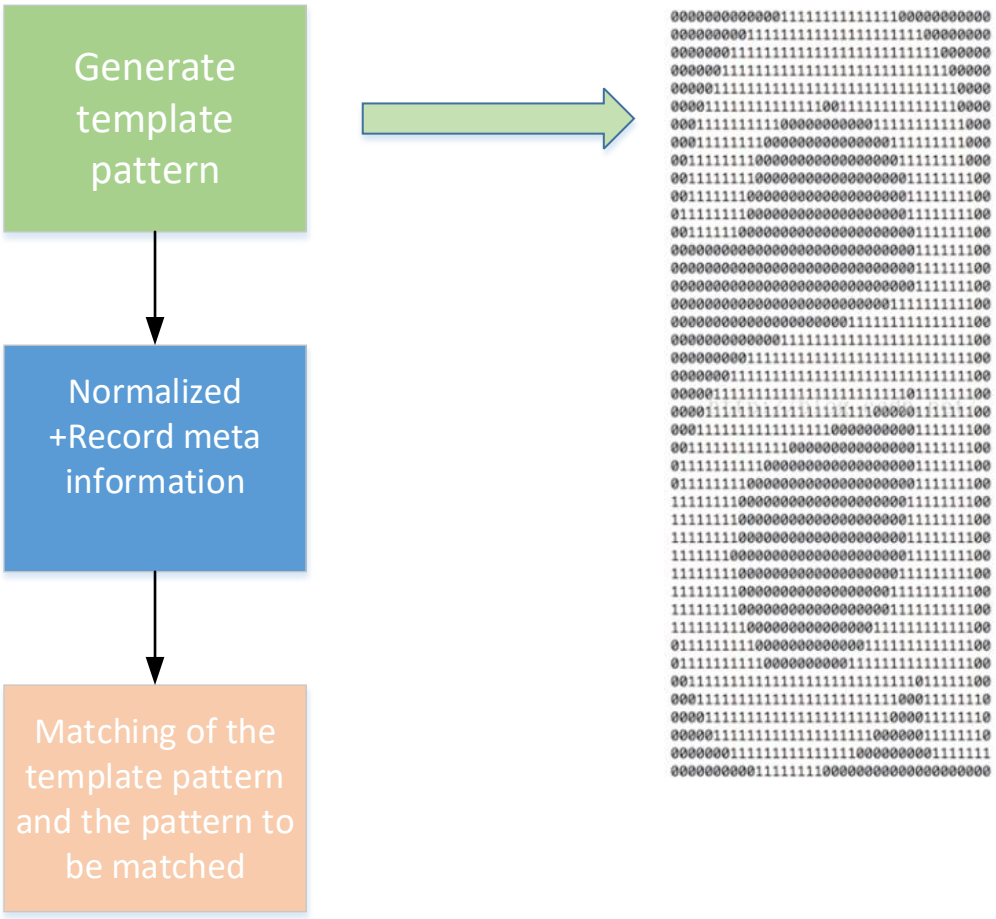
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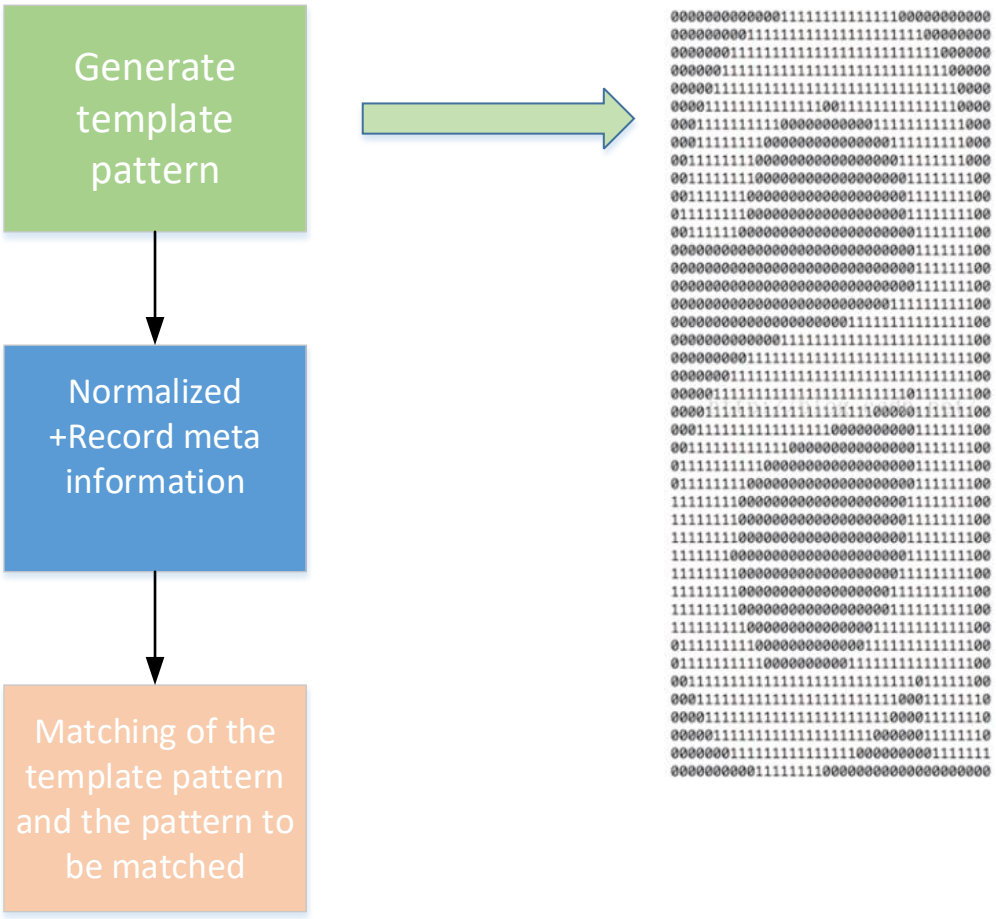
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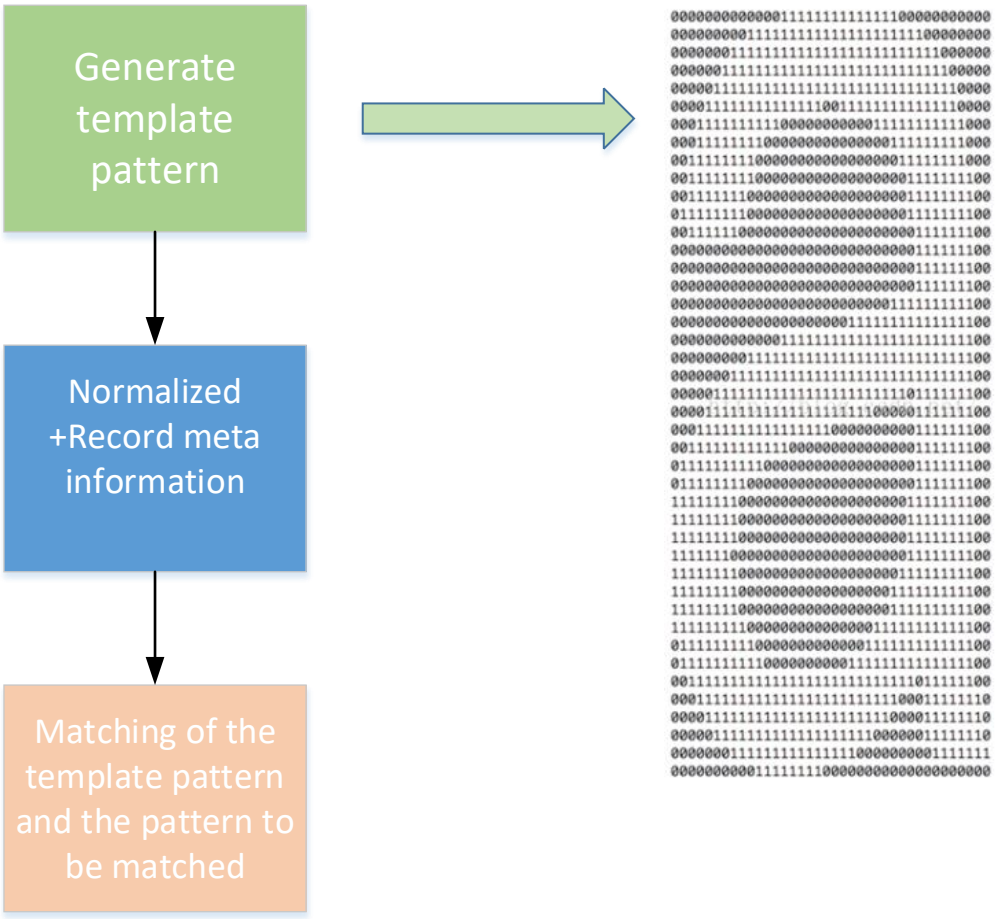
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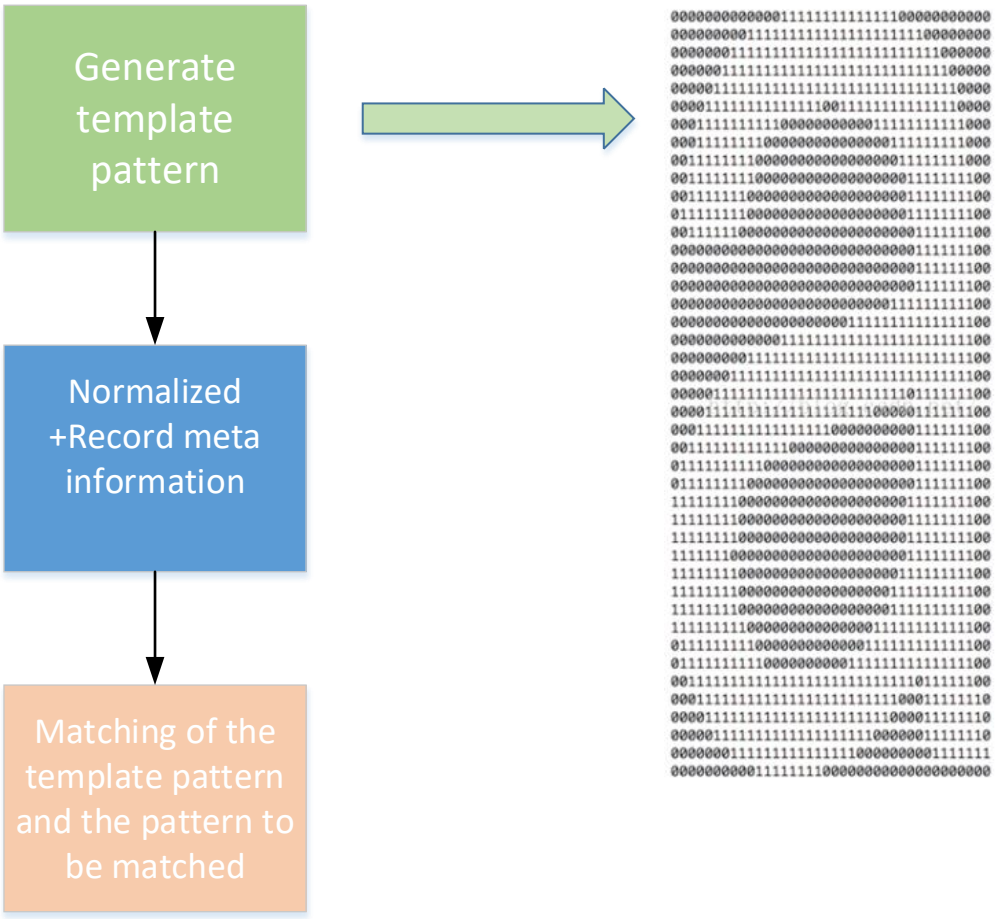
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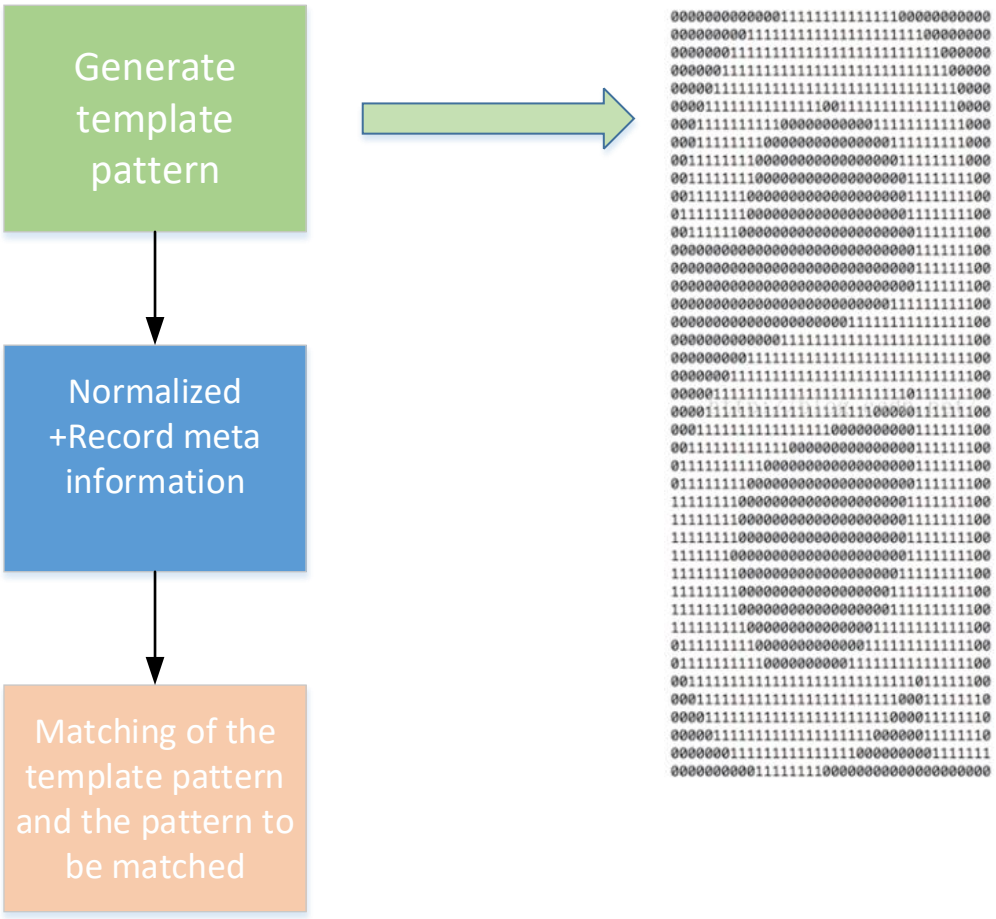
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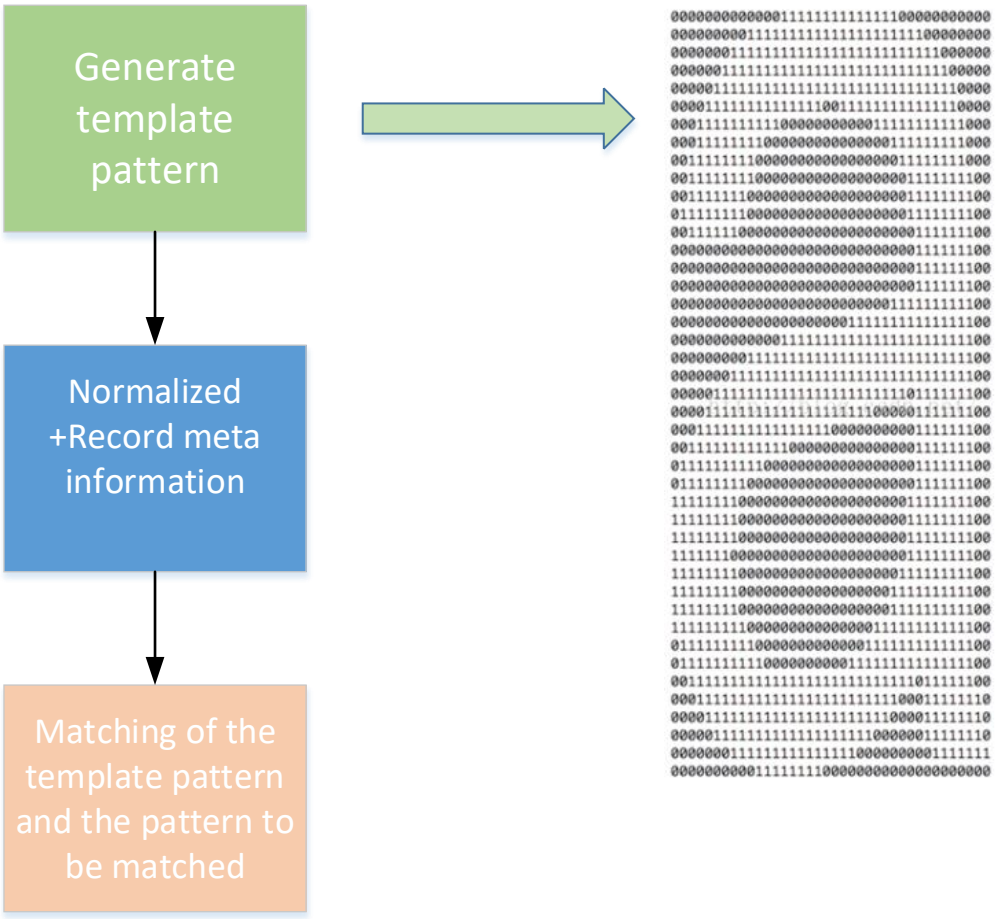
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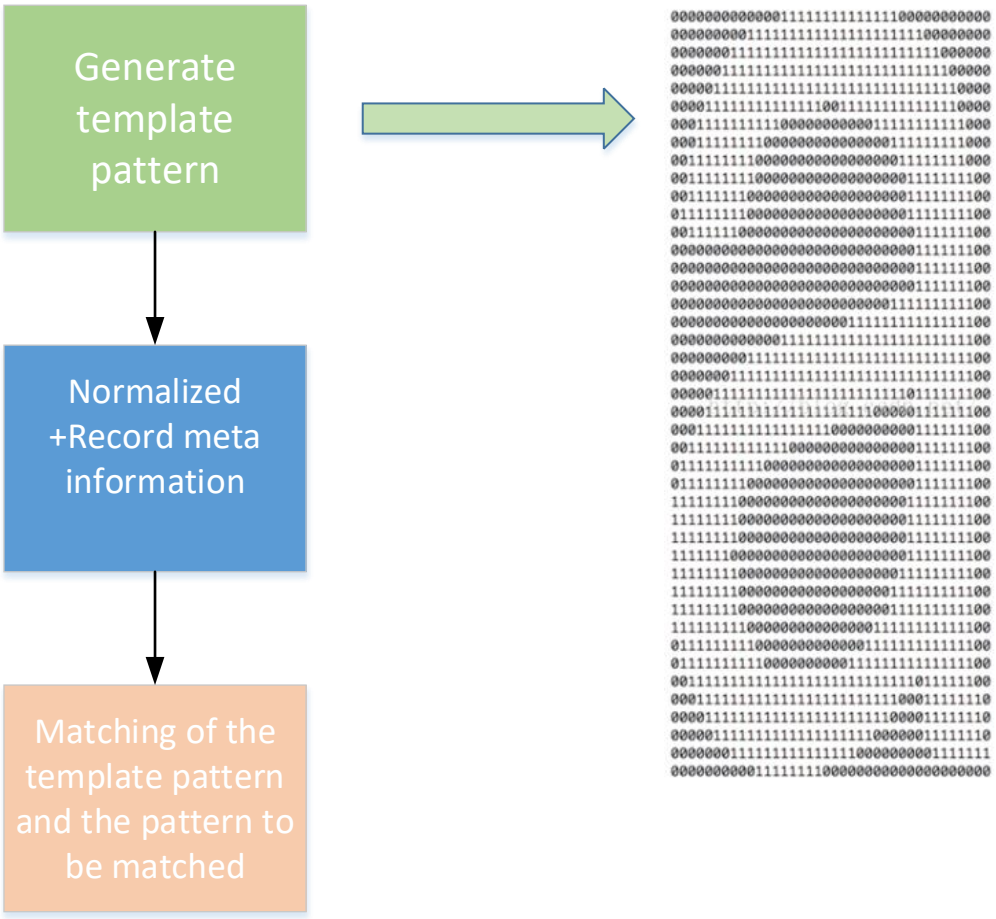
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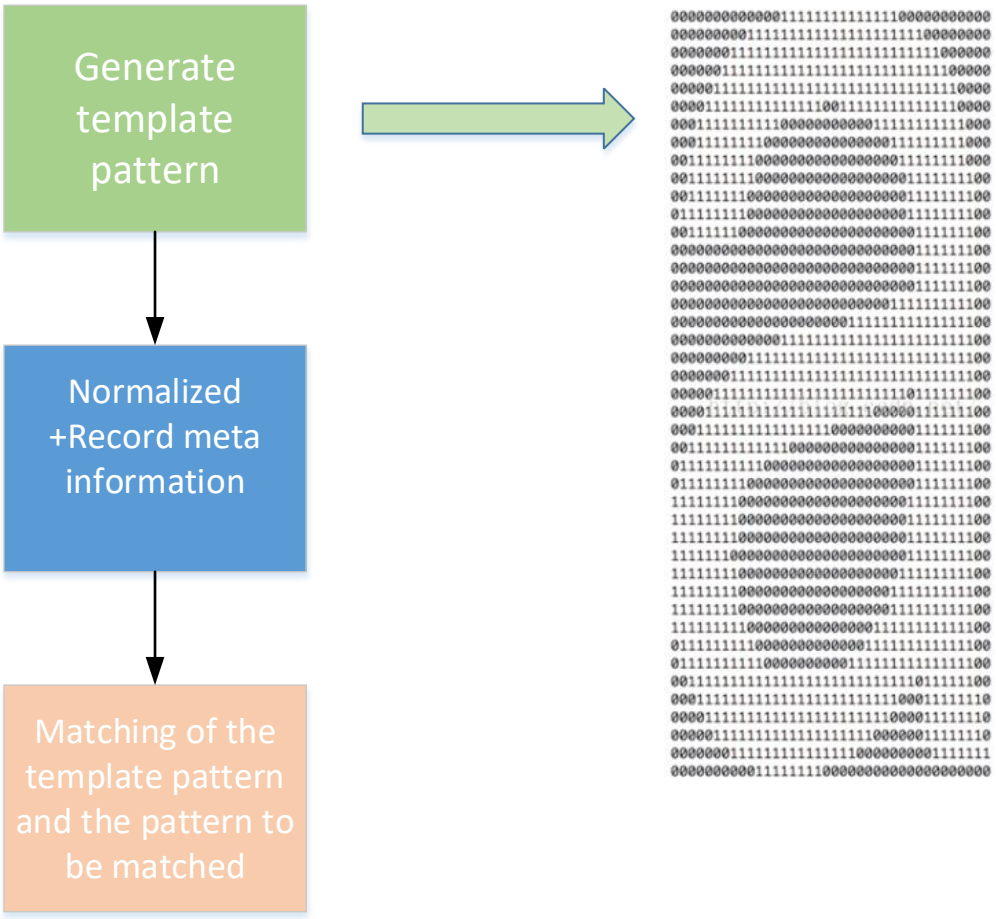
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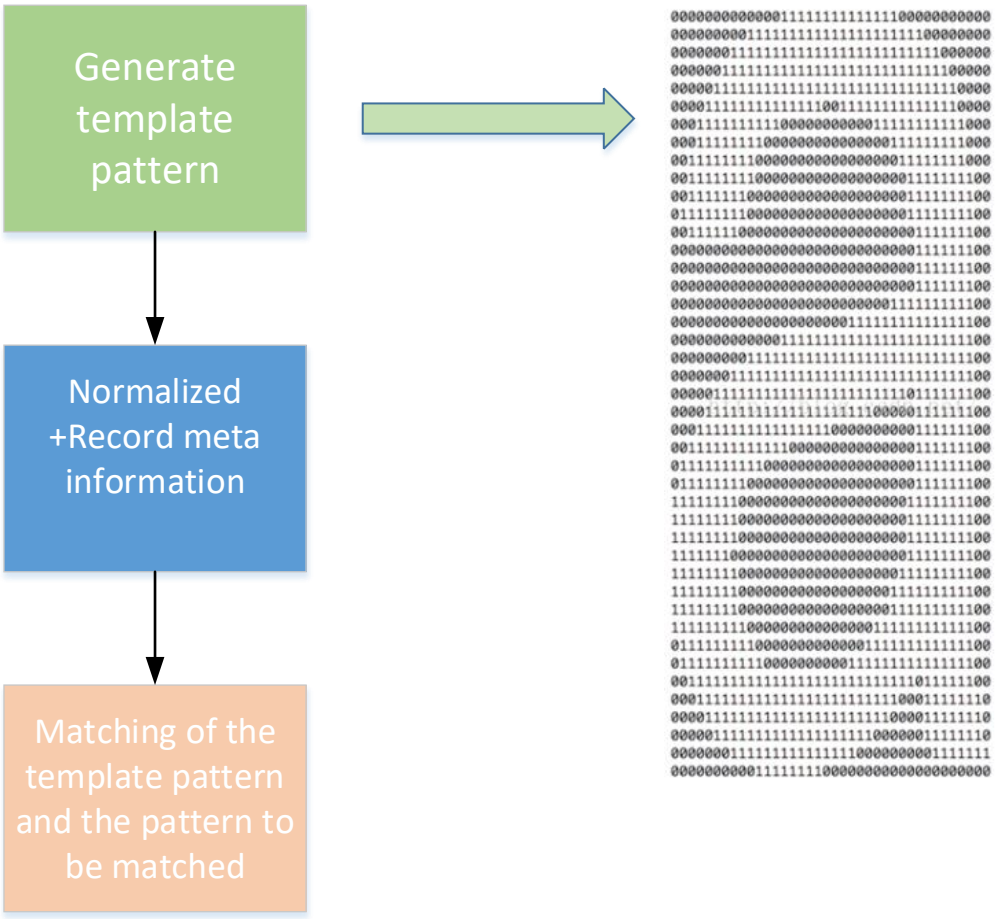
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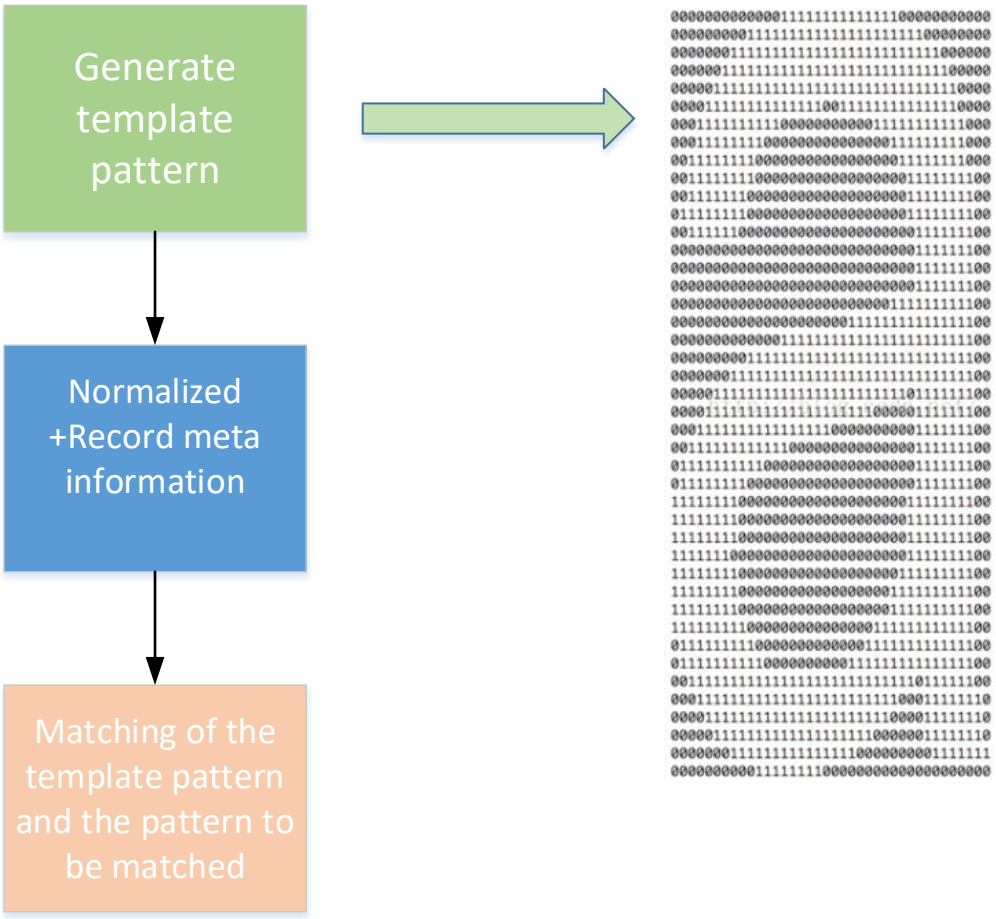
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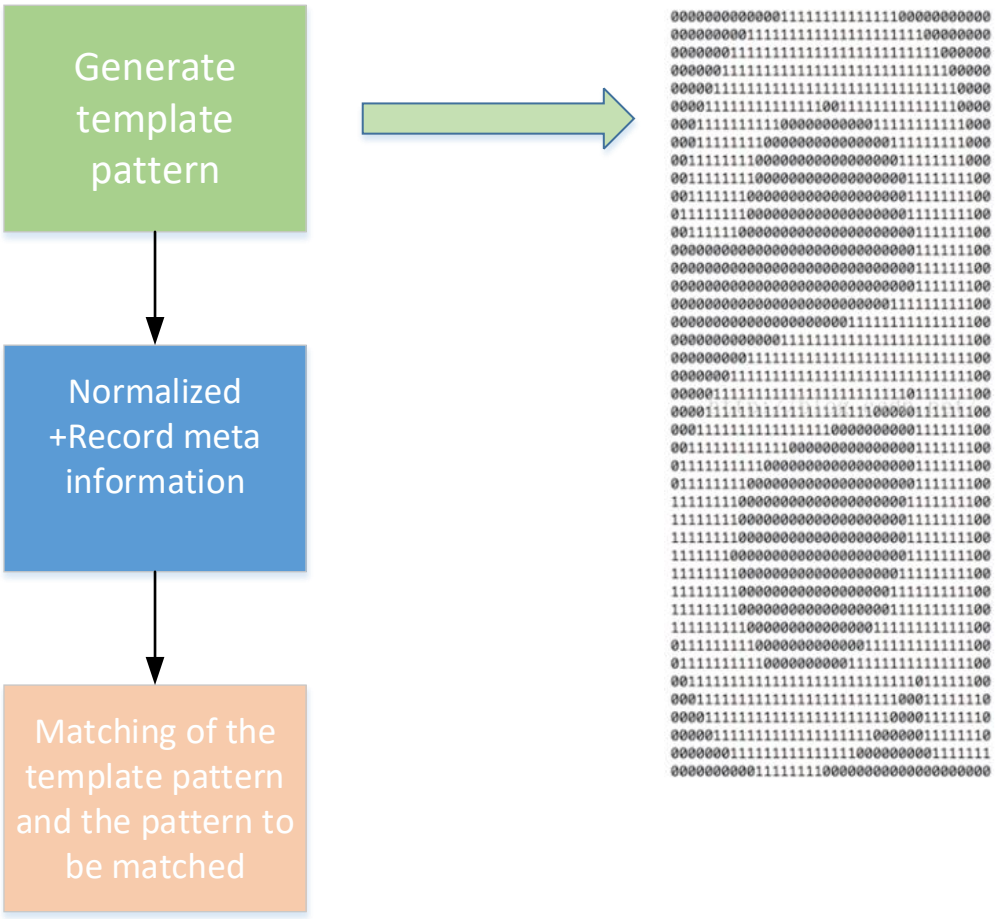
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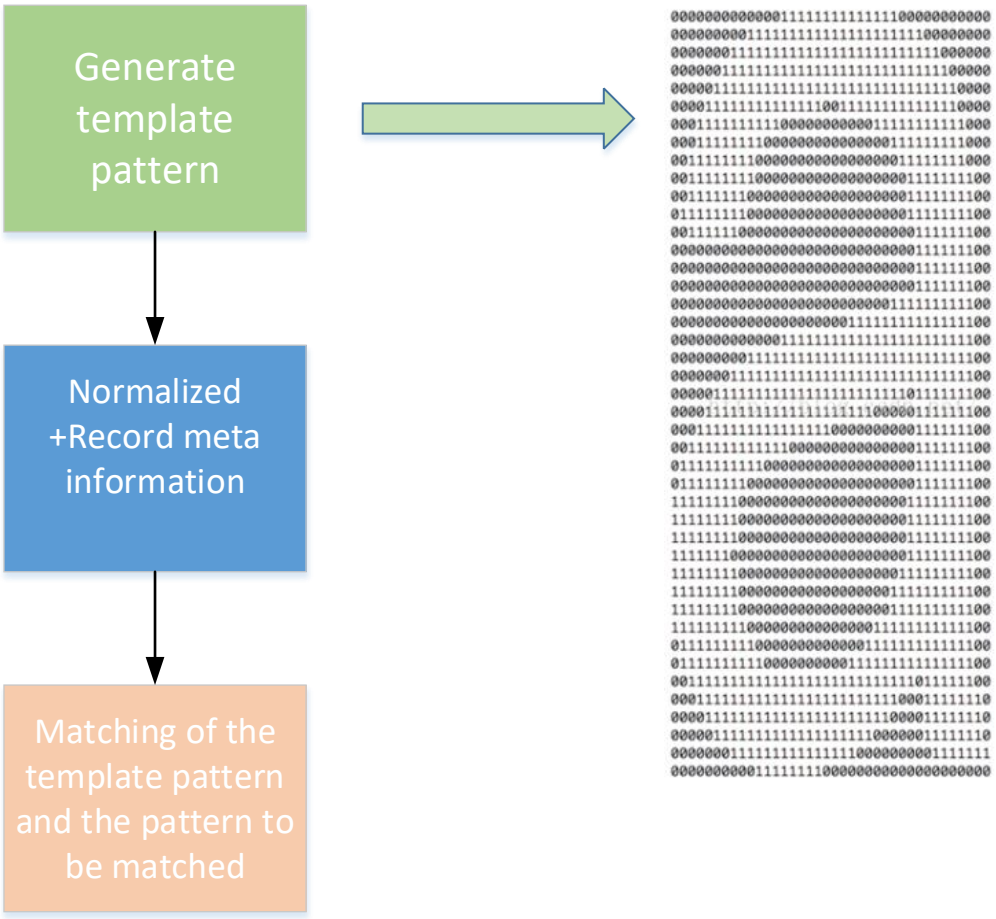
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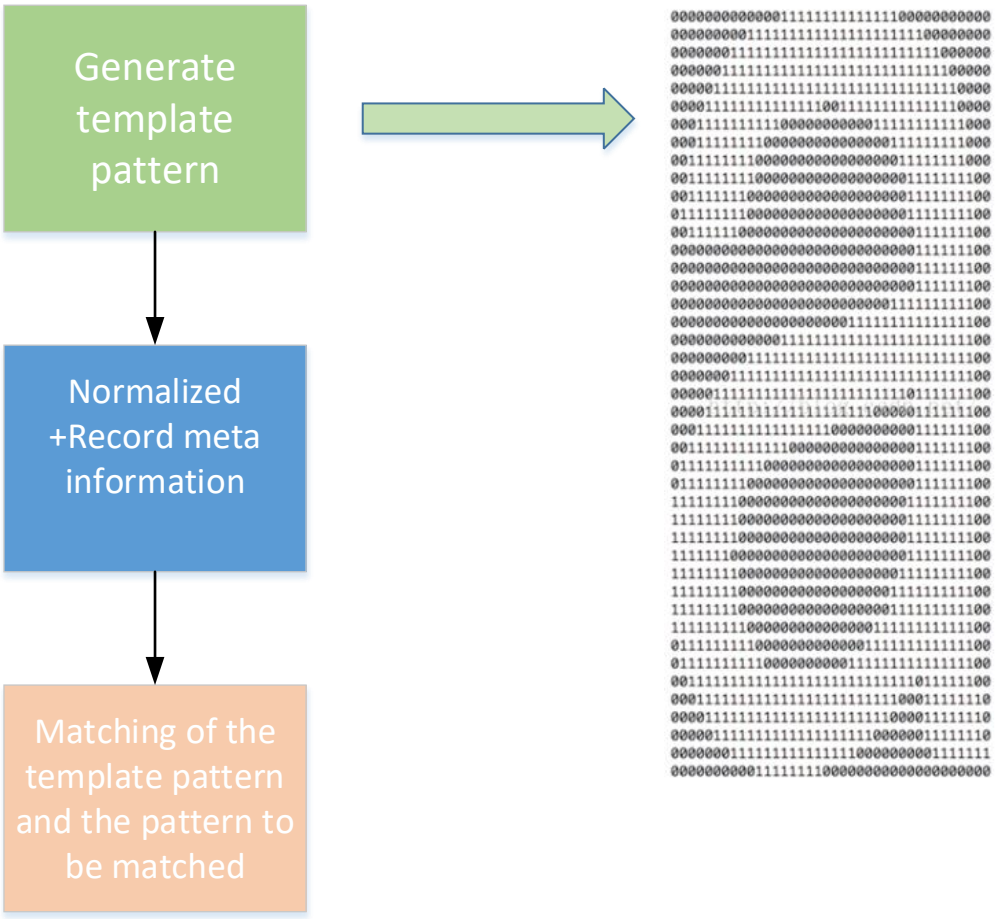
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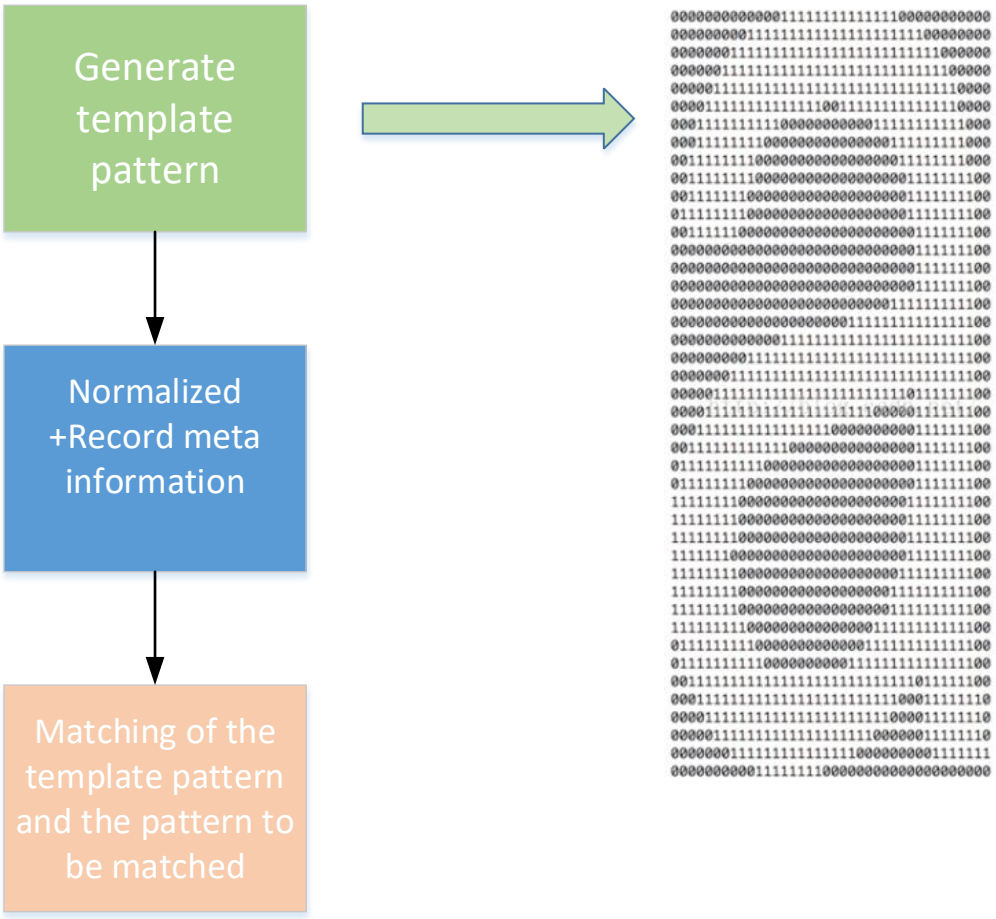
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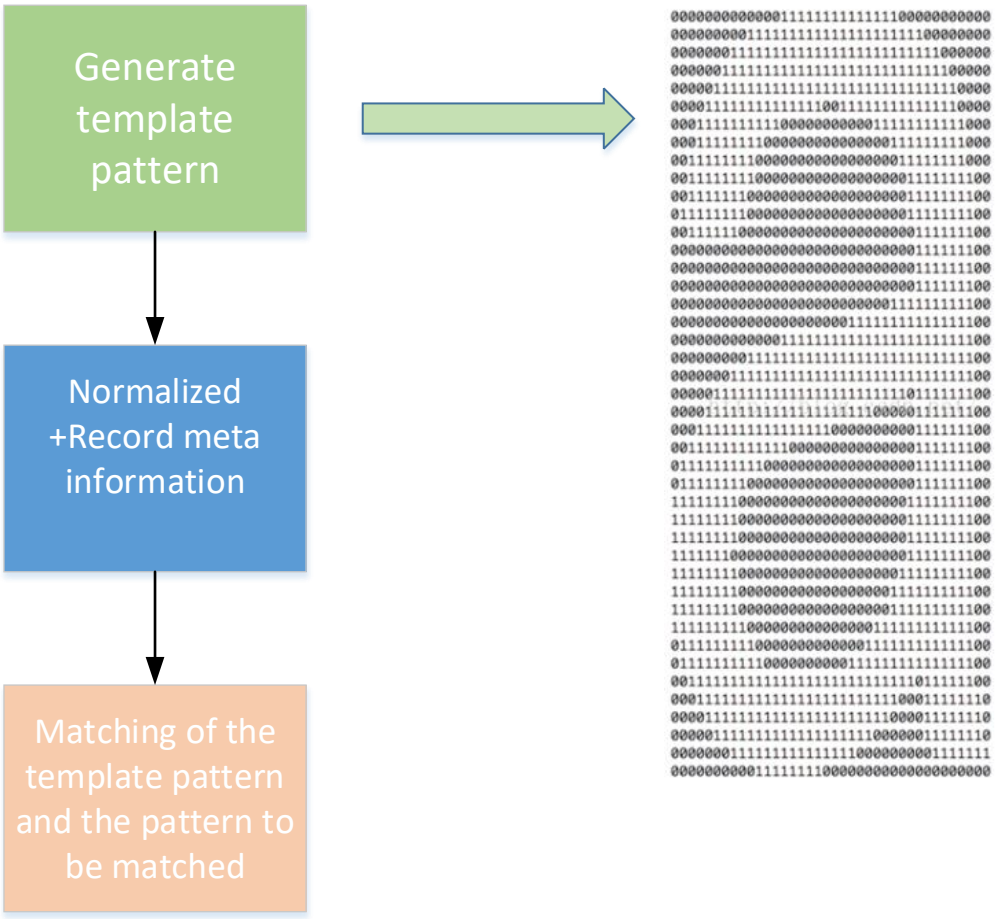
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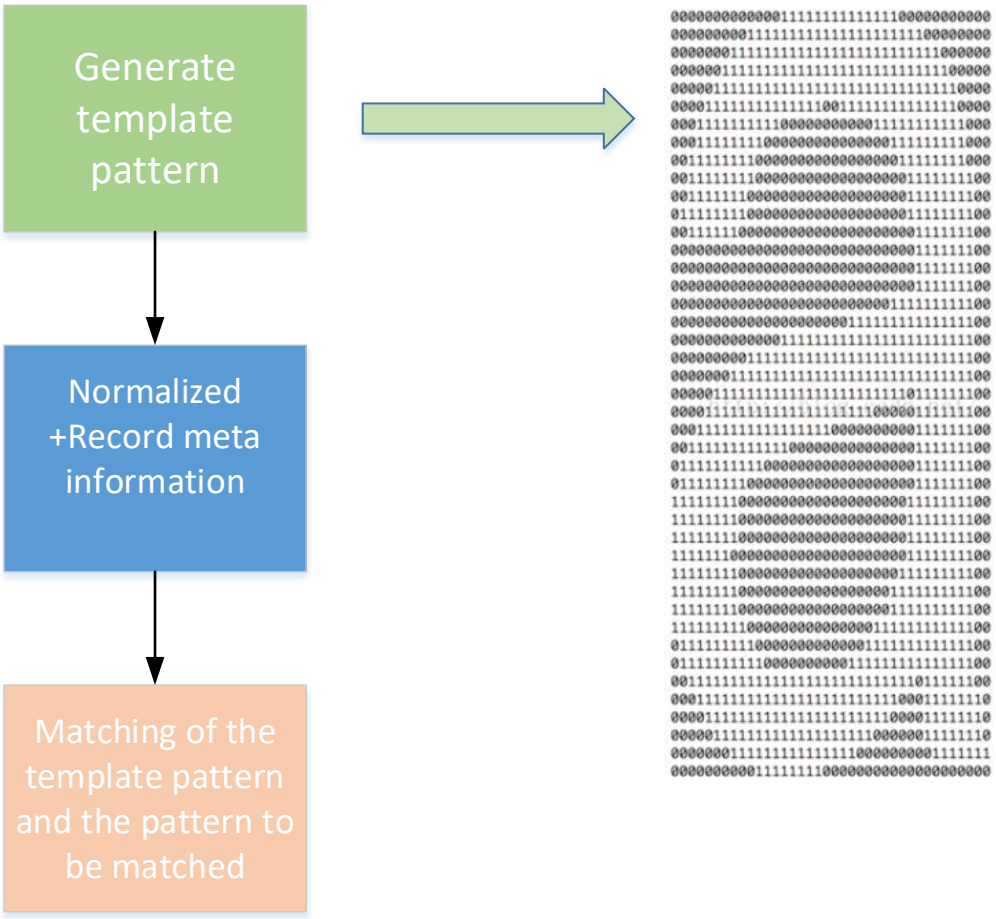
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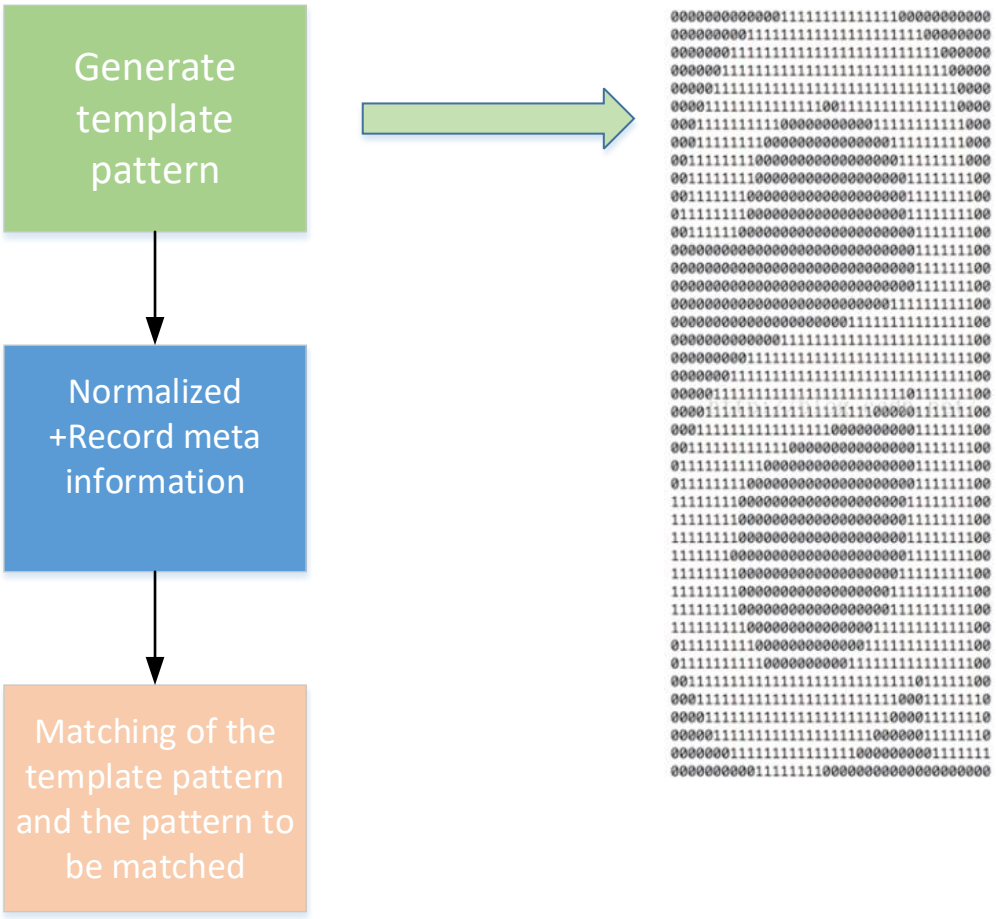
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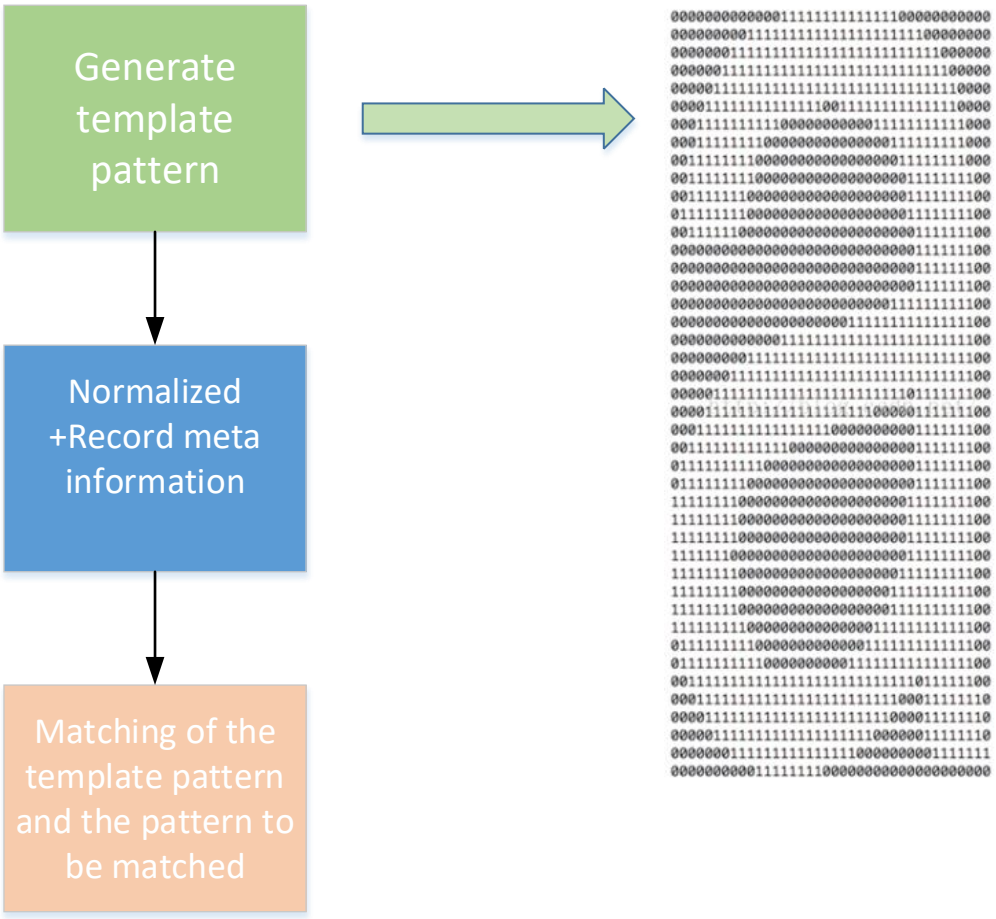
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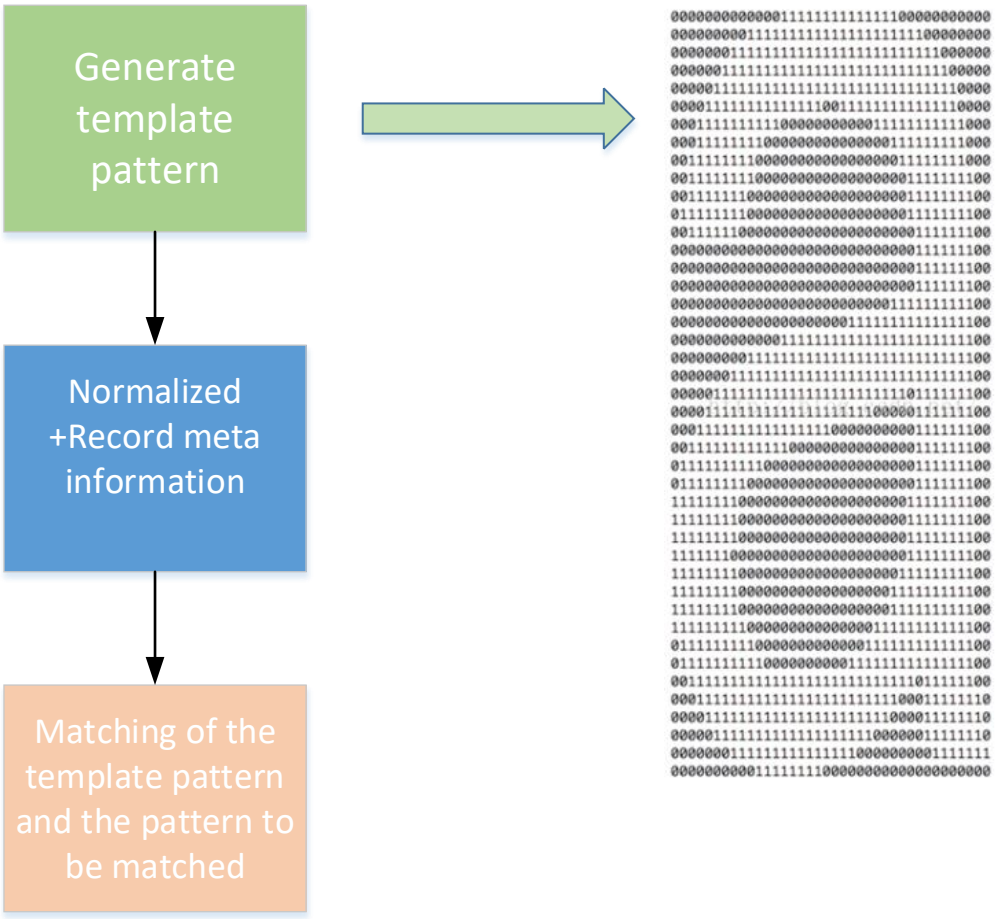
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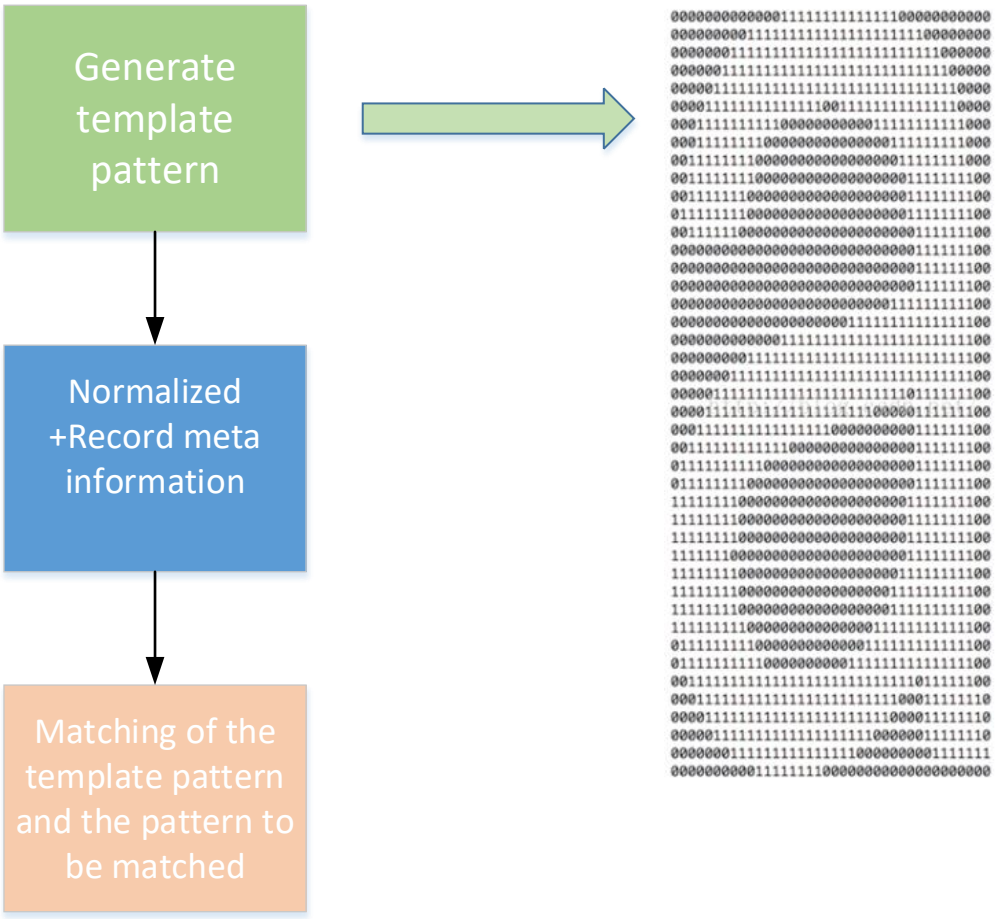
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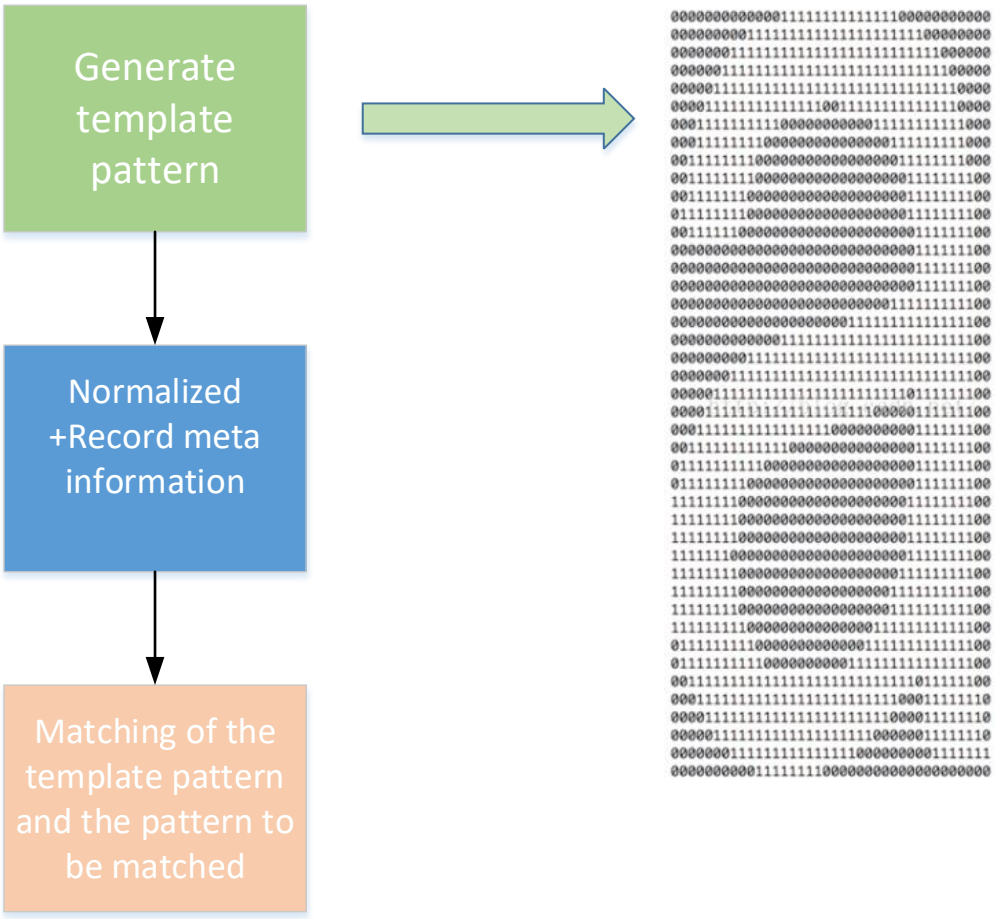
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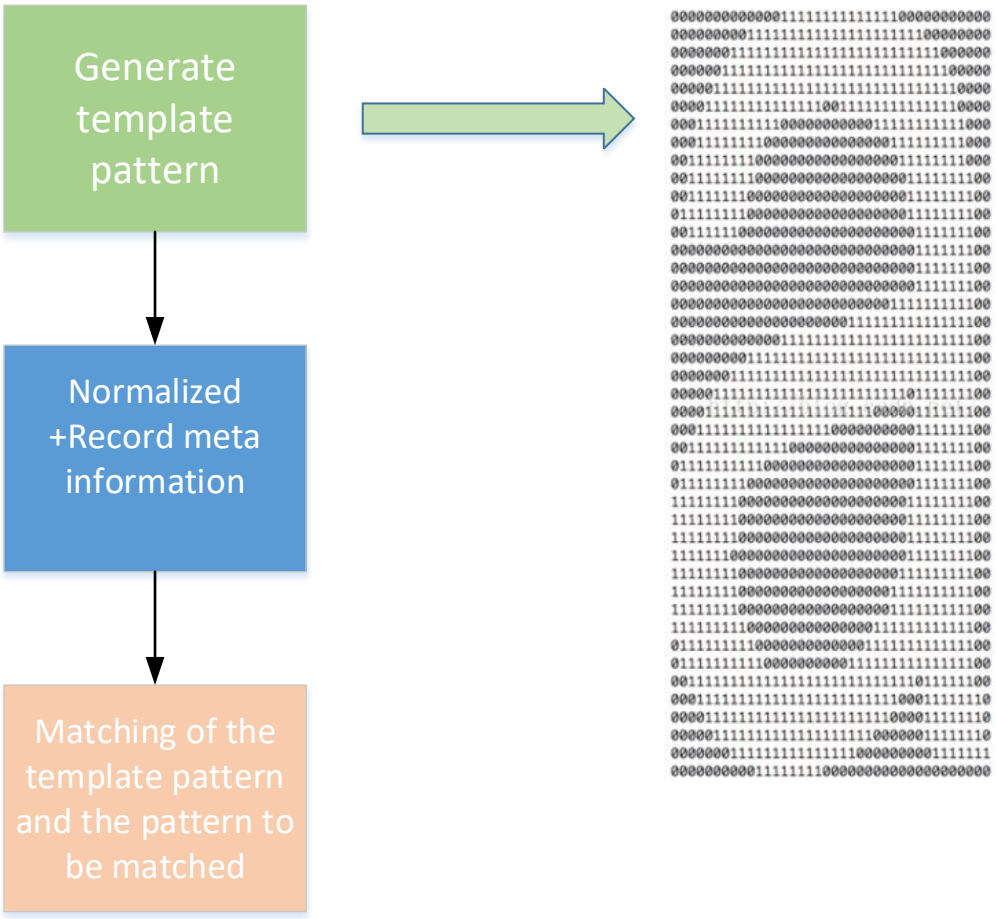
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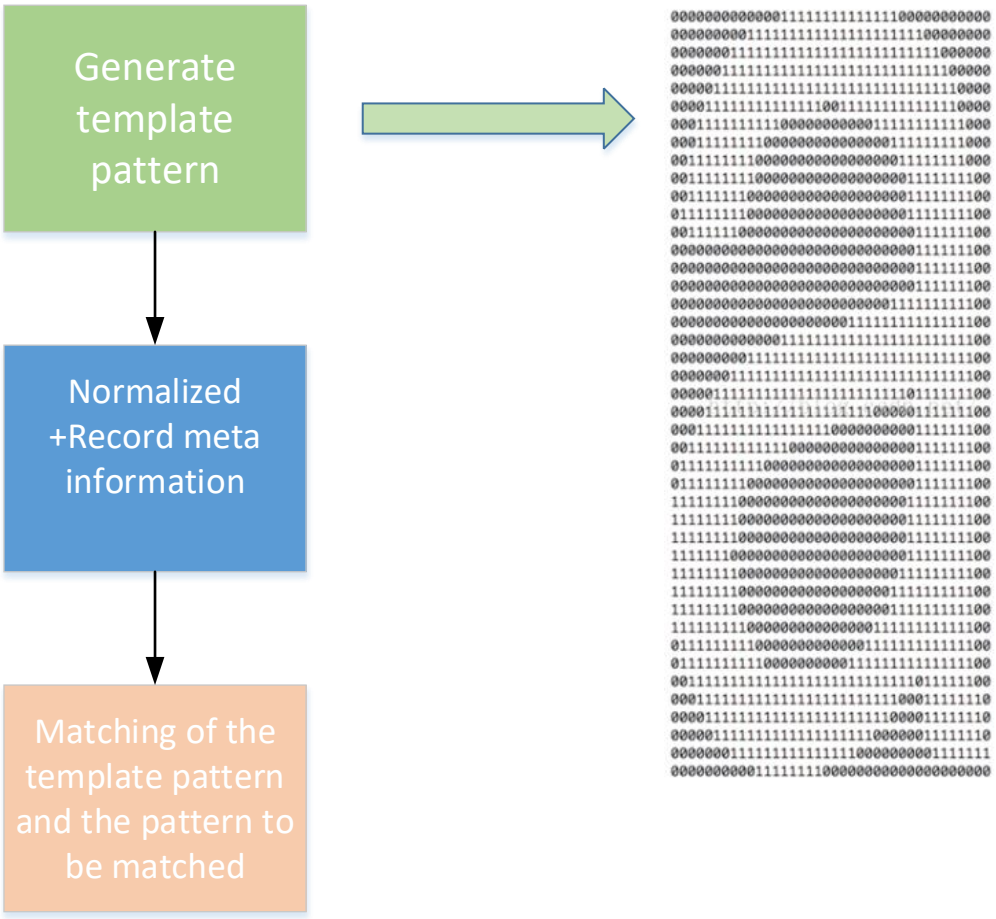
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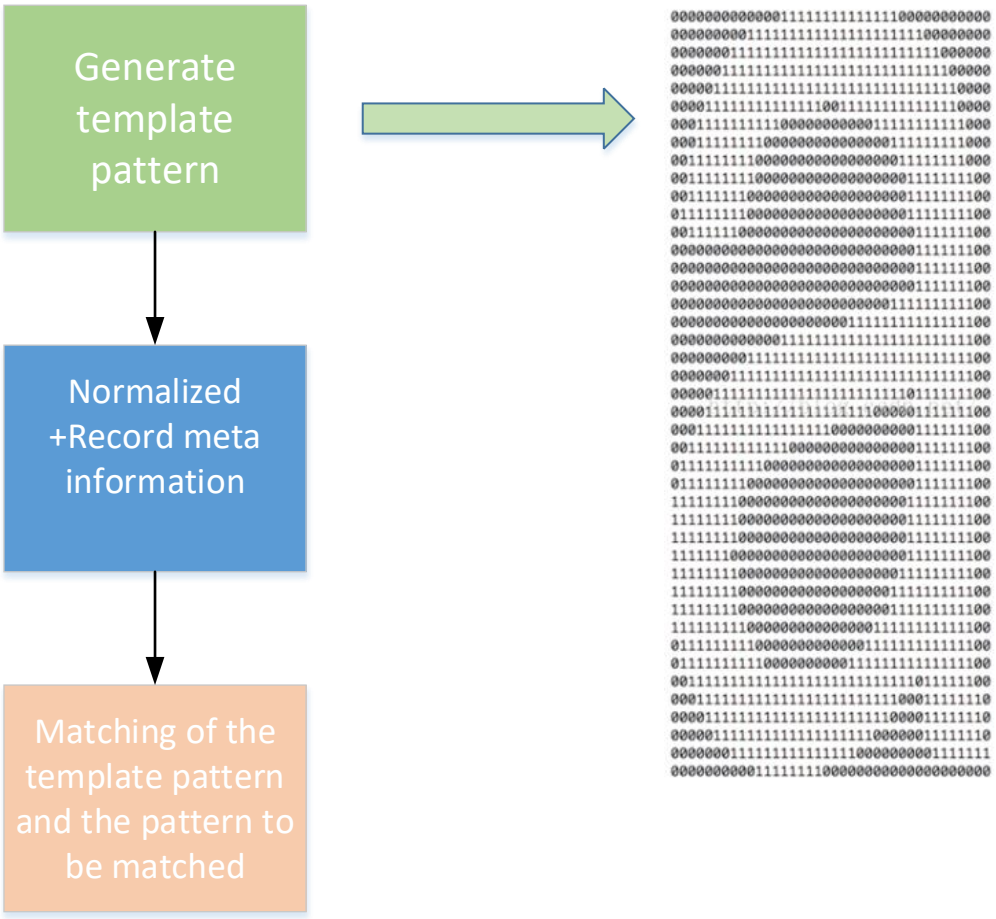
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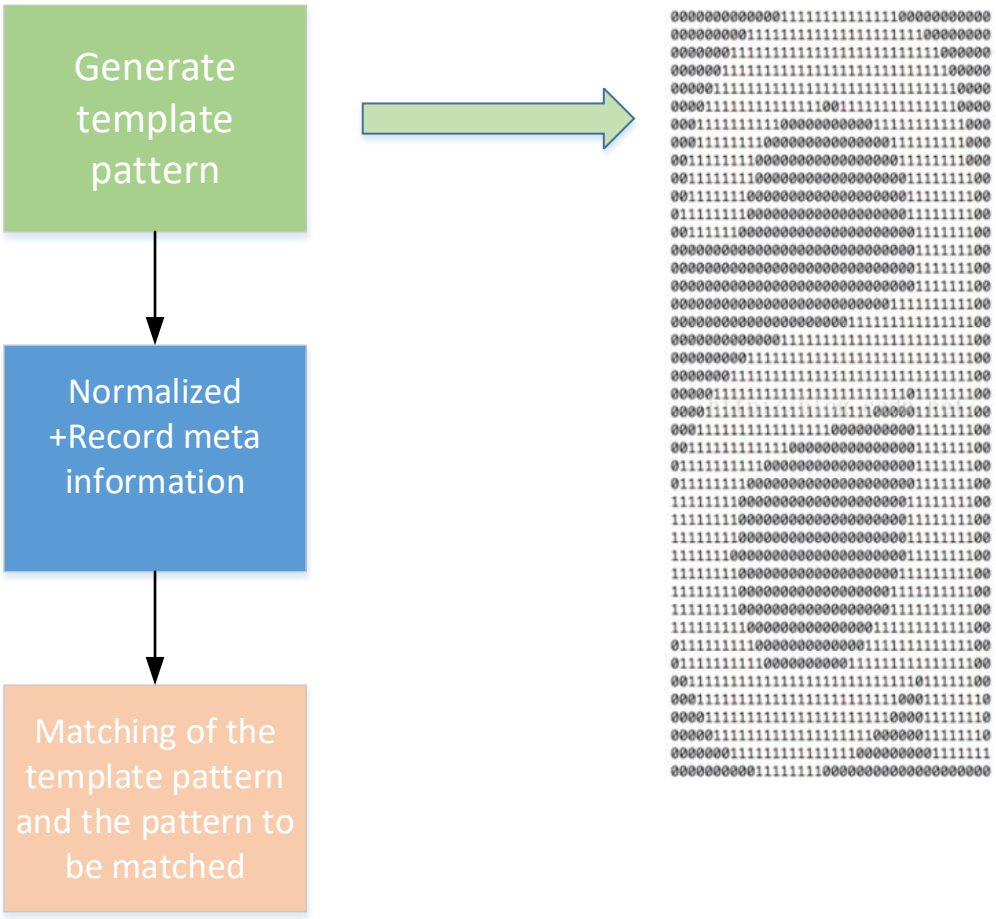
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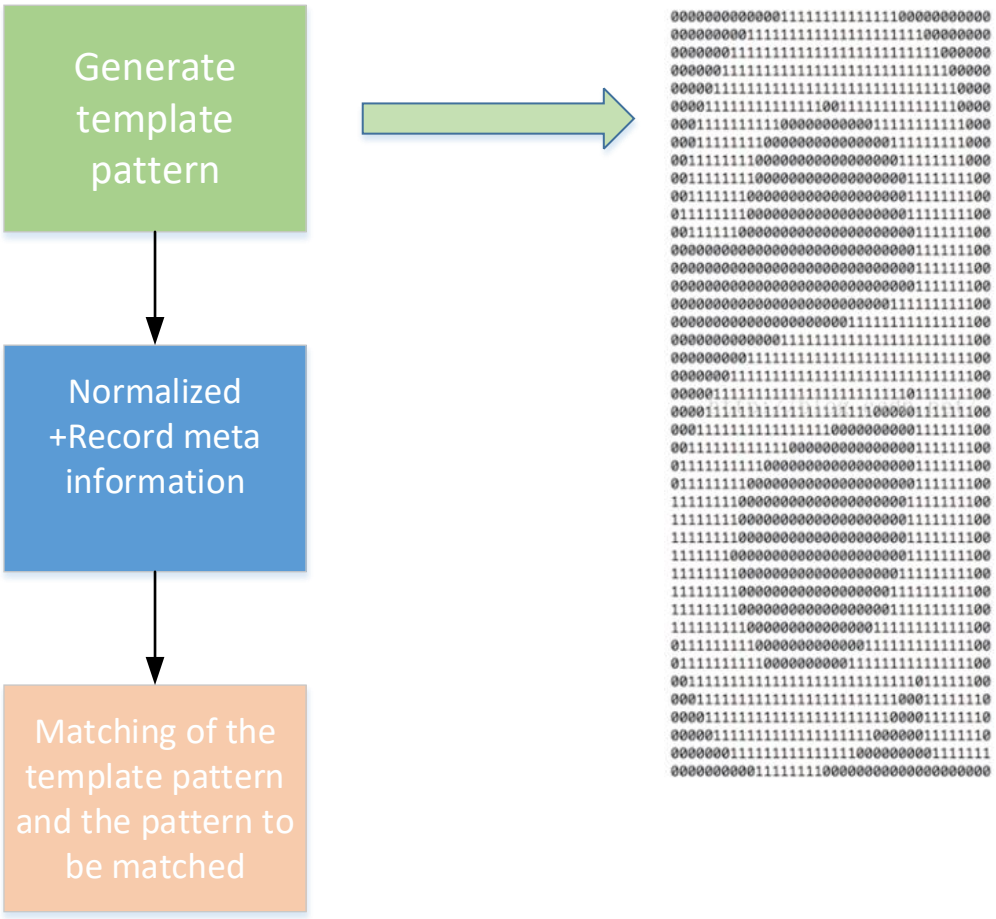
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