

1) The algorithm is divided into stages, the most important stages that led to the strength of encryption is the Mix column because it relied on mathematical operations, including multiplying polynomial equations and logical operations. The so-called local and global search was adopted in modifying the generations of the Population, as the local includes keeping the half that corresponds to the explicit text and randomly re-generating the second half and the global includes changing the element completely in the population randomly. 2) The S-box acts as a second key, and thus we have two keys in the encryption & decryption process, and the generation of the s-box was done in an unconventional way as explained in the practical part.