**Comparison between DES, Triple DES, and AES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **DES** | **Triple DES** | **AES** |
| Developed | 1977 | 1978 | 2000 |
| Key Length | 56 bits | 168 bits, 112 bits | 128, 192, 256 bits |
| Cipher Type | Symmetric Block Cipher | Symmetric Block Cipher | Symmetric Block Cipher |
| Block Size | 64 bits | 64 bits | 128 bits |
| Number of Rounds | 16 | 16 | 10,12,14 |
| Possible Keys | 256 | 2112 , 2168 | 2128, 2192 , 2256 |

**Analysis**

***Dimension analysis***

|  |  |  |  |
| --- | --- | --- | --- |
| **Algorithm** | **File Name** | **Dimension of Original Image (pixel)** | **Dimension of Encrypted image (pixel)** |
| AES | Image1.jpg | 274\*184 | 274\*184 |
| Image2.jpg | 800\*600 | 800\*600 |
| DES | Image1.jpg | 274\*184 | 274\*184 |
| Image2.jpg | 800\*600 | 800\*600 |
| 3DES | Image1.jpg | 274\*184 | 274\*184 |
| Image2.jpg | 800\*600 | 800\*600 |

Table.2. Dimension Analysis of Two input images in the three different Algorithms

***Size analysis***

|  |  |  |  |
| --- | --- | --- | --- |
| **Algorithm** | **File Name** | **Size of Original Image (bytes)** | **Size of Encrypted image (bytes)** |
| AES | Image1.jpg | 8267 | 31678 |
| Image2.jpg | 34750 | 288299 |
| DES | Image1.jpg | 8267 | 31701 |
| Image2.jpg | 34750 | 287179 |
| 3DES | Image1.jpg | 8267 | 31694 |
| Image2.jpg | 34750 | 287276 |

Table.3. Size Analysis of Two input images in the three different Algorithms

***Time Analysis***

|  |  |  |
| --- | --- | --- |
| **Algorithm** | **Image1.jpg** | **Image2.jpg** |
| AES | 25 secs | 26 secs |
| DES | 23 secs | 23 secs |
| 3 DES | 25 secs | 23 secs |

Table.4. Time Analysis of Two input images in the three different Algorithms

**Observations**

From the above analysis of these algorithms ,

* According to Dimension Analysis, it is analyzed that the dimensions of the original image and the dimensions of the encrypted image are same.
* According to Size Analysis, it is analyzed that the size of encrypted image is much greater than the size of the original image.
* According to Time Analysis, the time taken by all these three algorithms for encrypting an image are almost same.