

DNA Digital Data Storage: Coding Theory Approach Using Kernel Code

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Abstract

In the proposed DNA based storage system, the sequence of information taken from a finite Abelian group is mapped onto DNA codewords. The homomorphic properties of the mapping address the storage and retrieval problems related to GC-content and Reverse compliment.

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```
File - Kernalcodes1 (1)
E:\pythonProject1\venv\Scripts\python.exe "C:/Users/
admin/Downloads/Kernalcodes1 (1).py"
Enter the length of the codeword :5
Binary code Kernel code      DNA Code
00000      1000001 [G, C, C, A, A, A]
00001      1000010 [T, C, C, C, A, T]
00010      1000100 [T, C, C, C, T, A]
00011      1000111 [G, C, C, A, T, T]
00100      1001000 [T, C, C, G, A, A]
00101      1001011 [G, C, C, T, A, T]
00110      1001101 [G, C, C, T, T, A]
00111      1001110 [T, C, C, G, T, T]
01000      1010000 [T, C, G, C, A, A]
01001      1010011 [G, C, G, A, A, T]
01010      1010101 [G, C, G, A, T, A]
01011      1010110 [T, C, G, C, T, T]
01100      1011001 [G, C, G, T, A, A]
01101      1011010 [T, C, G, G, A, T]
01110      1011100 [T, C, G, G, T, A]
01111      1011111 [G, C, G, T, T, T]
10000      1100000 [T, G, C, C, A, A]
10001      1100011 [G, G, C, A, A, T]
10010      1100101 [G, G, C, A, T, A]
10011      1100110 [T, G, C, C, T, T]
10100      1101001 [G, G, C, T, A, A]
10101      1101010 [T, G, C, G, A, T]
10110      1101100 [T, G, C, G, T, A]
10111      1101111 [G, G, C, T, T, T]
11000      1110001 [G, G, G, A, A, A]
11001      1110010 [T, G, G, C, A, T]
11010      1110100 [T, G, G, C, T, A]
11011      1110111 [G, G, G, A, T, T]
11100      1111000 [T, G, G, G, A, A]
11101      1111011 [G, G, G, T, A, T]
11110      1111101 [G, G, G, T, T, A]
11111      1111110 [T, G, G, G, T, T]
Minimum reverse Compliment is 2

Process finished with exit code 0
```