

DNA Storage using Polar Codec

User Manual

Web App

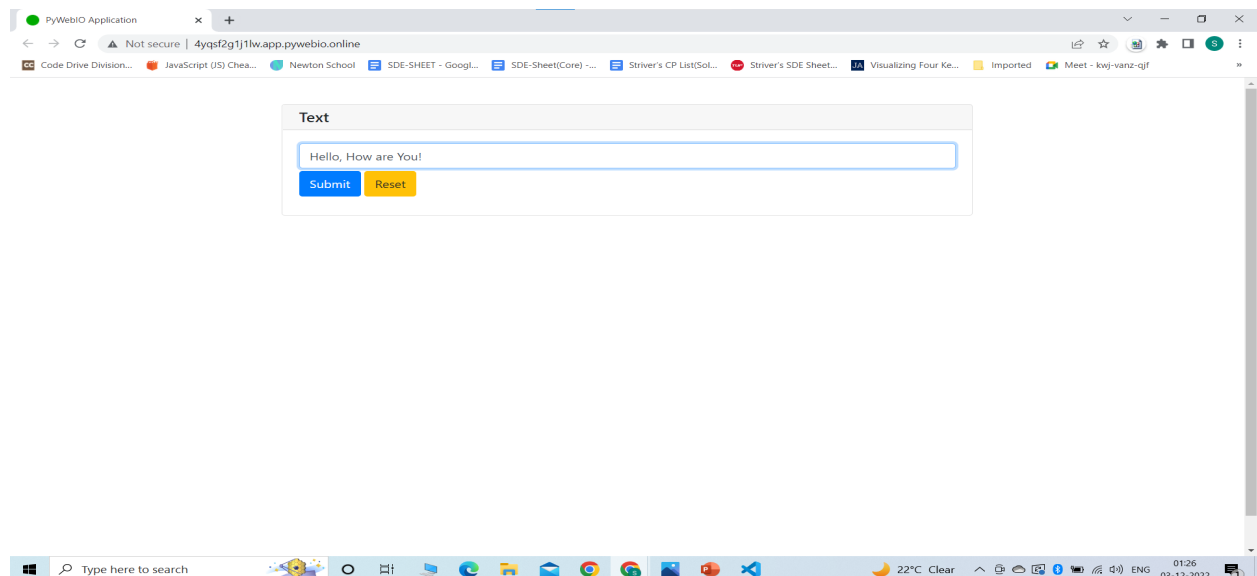
Encoder: <http://hn8qenyu4brw.app.pywebio.online/>

Decoder: <http://hc2zz2pry0cj.app.pywebio.online/>

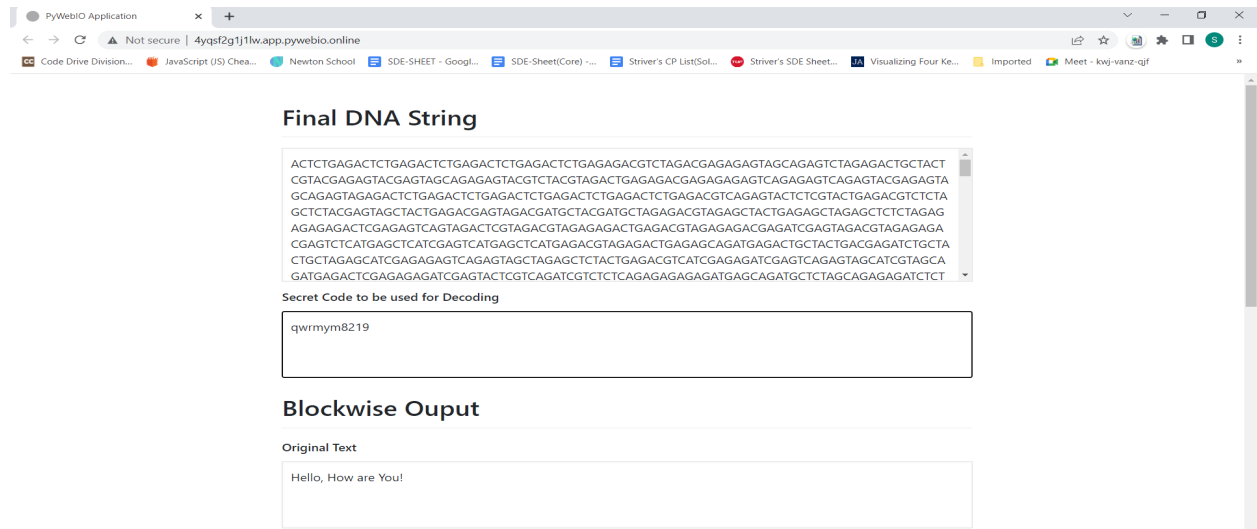
GitHub Repository: https://github.com/KathanS/DNA_Codec

DNA Polar Codec-Encoder: This web application is used to encode the data into a DNA string which can be used further for DNA Storage.

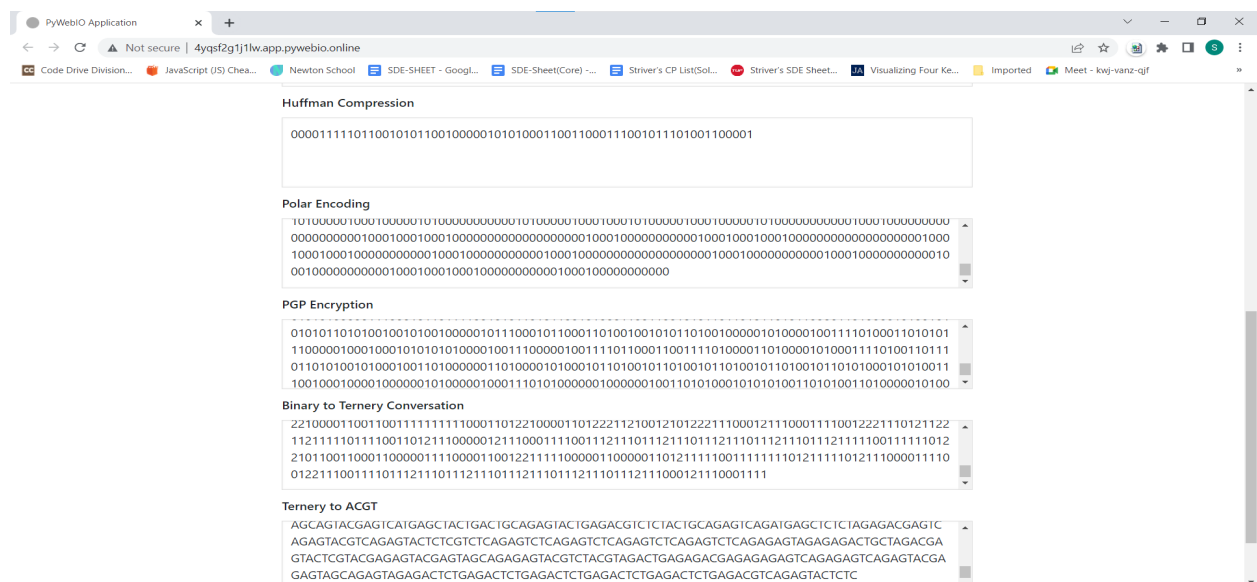
Step 1: Open DNA Polar Encoder using the link given. It will open the below web application.



Step 2: It will ask for the text to be encoded. Copy-Paste the text that you want to encode. Then click on submit. The below image shows the final DNA string for the input “**Hello World**”.

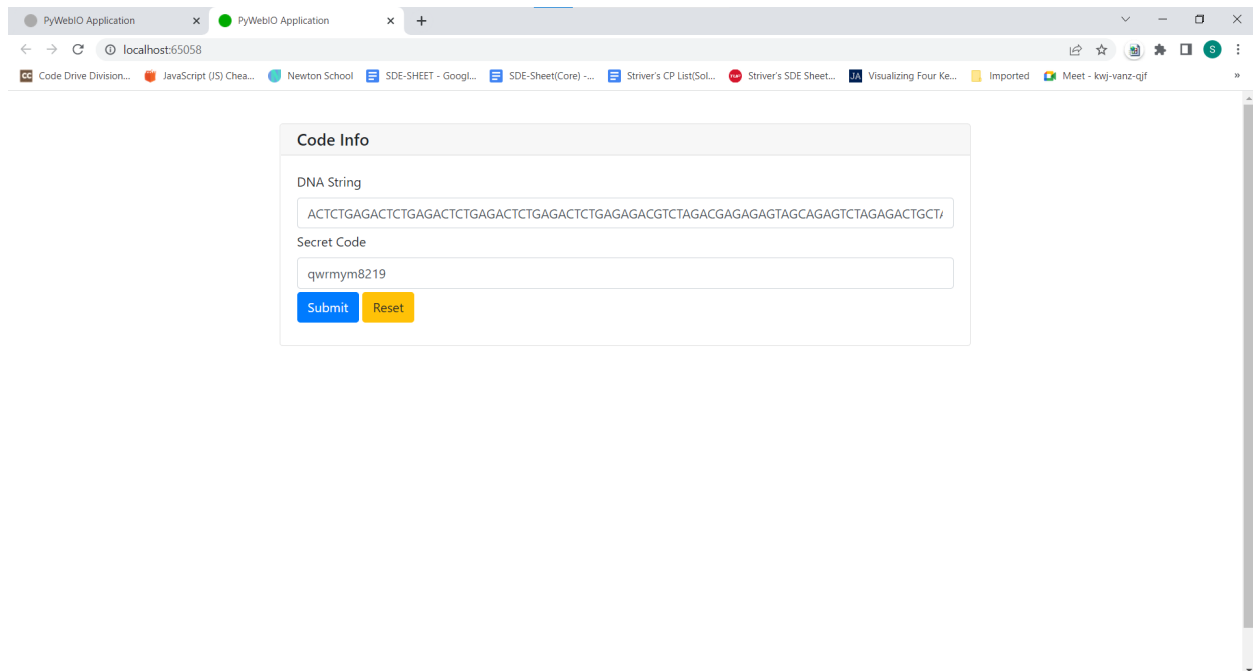


Step 3: The web application also shows the block-wise output of the input text until we get the final DNA String. As shown, the input text undergoes ASCII to binary conversion, Huffman Compression, Polar Encoding, PGP Encryption, Binary to Ternary Conversion, and Ternary to ACGT.



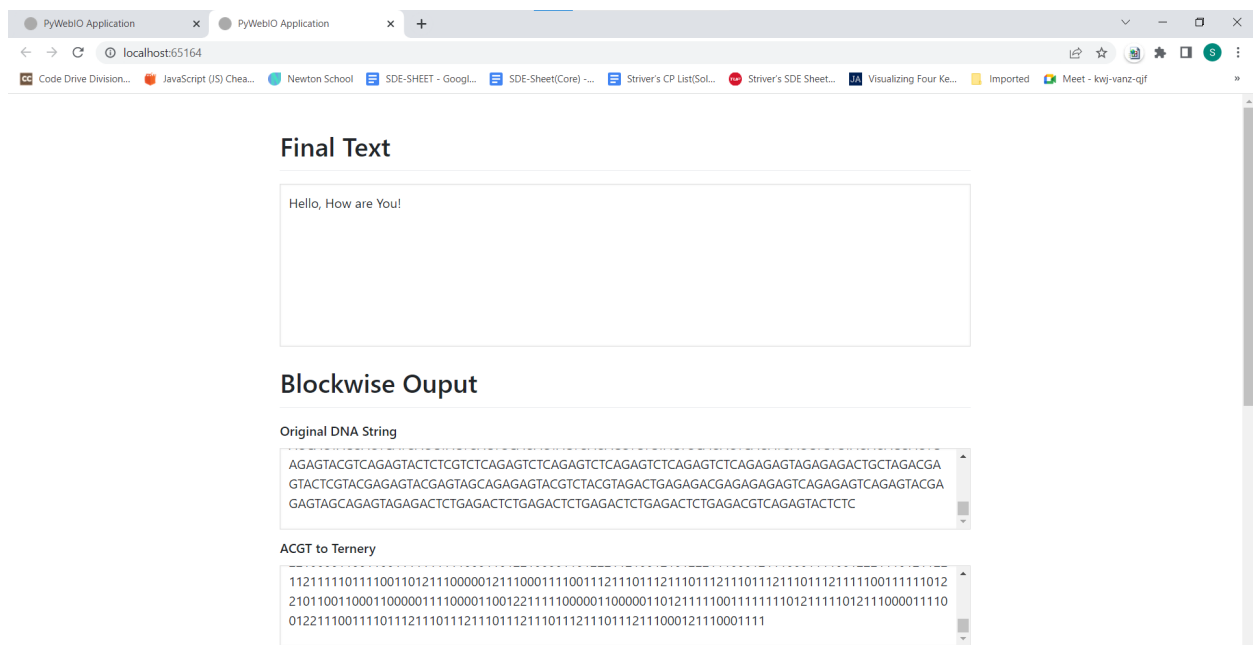
DNA Polar Codec-Decoder: This web application is used to decode the DNA string back to ASCII Text.

Step 1: Open DNA Polar Decoder using the link given. It will open the below web application. It will ask for the DNA String to be decoder. Copy-Paste the DNA String. Then enter the secret code, which is unique for the individual users Then click on submit.



The screenshot shows a web browser window with two tabs labeled 'PyWebIO Application'. The address bar shows 'localhost:65058'. The browser's tab bar includes several open tabs: 'Code Drive Division...', 'JavaScript (JS) Chea...', 'Newton School', 'SDE-SHEET - Googl...', 'SDE-Sheet(Core) - ...', 'Striver's CP List(Sol...', 'Striver's SDE Sheet...', 'Visualizing Four Ke...', 'Imported', and 'Meet - kwj-vanz-qjf'. The main content area displays a form titled 'Code Info'. This form contains two input fields: 'DNA String' with the value 'ACTCTGAGACTCTGAGACTCTGAGACTCTGAGACTCTGAGAGACGTCTAGACGAGAGAGTAGCAGAGCTAGAGACTGCT/' and 'Secret Code' with the value 'qwrmy8219'. Below these fields are two buttons: 'Submit' (blue) and 'Reset' (yellow).

Step 2: The below image shows the text which was encoded and stored in the DNA.



The screenshot shows the same web browser window, but the address bar now shows 'localhost:65164'. The main content area displays the results of the decoding process. At the top, under the heading 'Final Text', there is a text box containing the message 'Hello, How are You!'. Below this, under the heading 'Blockwise Ouput' (note the typo), there are two sections. The first section, 'Original DNA String', shows a long string of DNA characters: 'AGAGTACGTACAGAGTACTCTCGTCTCAGAGTCTCAGAGTCTCAGAGTCTCAGAGTCTCAGAGAGTAGAGAGACTGCTAGACGA GTACTGTACGAGAGTACGAGTAGCAGAGAGTACGTCTACGTAGACTGAGAGACGAGAGAGAGTACAGAGAGTACAGAGTACGA GAGTAGCAGAGTAGAGACTCTGAGACTCTGAGACTCTGAGACTCTGAGACTCTGAGACTCTGAGAGCTCAGAGTACTCTC'. The second section, 'ACGT to Ternery' (note the typo), shows the corresponding binary representation: '11211111011110011012111000001211100011110011121110111211101112111011121110111211110011111012 2101100110001100000111100001100122111110000011000001101211110011111110121111012111000011110 01221110011110111211101112111011121110111211101112111000121110001111'.

Step 3: The web application also shows the block-wise output of the decoder. As shown, the input text undergoes ACGT to Ternary conversion, Ternary to binary, PGP Decryption, Polar Decoding, and Huffman Decompression.

