

At the top of the class hierarchy, we have the Cipher interface. This interface is at the top because it will contain the encrypt() and decrypt() methods that will be implemented by the AbstractCipher abstract class. This abstract class will contain the plaintext and ciphertext private instance variables that will be used by its subclasses, along with the methods implemented from the Cipher interface. The Caesar, RandomSubstitution, Vigenere, and RSA subclasses will inherit the AbstractCipher class. The RSA subclass will additionally implement the ChunkReader interface as it will encrypt and decrypt the bit representation of the plaintext. CipherFactory is associated with the subclasses of AbstractCipher, as it holds references to each of them. The Main class is associated with the CipherFactory class because it will use it to create the required cipher object. The Main class will also contain the main method and helper functions to parse the command-line arguments.