

**FIGURE 2.1**

A Maplet for substitution ciphers.

The image shows a Java Maplet window titled "Substitution Cipher". The window has a standard Mac OS X-style title bar with minimize, maximize, and close buttons. The main content area is divided into several sections:

- Top Section:** A dropdown menu labeled "Substitution cipher type? ?" and a text field labeled "Keyword:".
- Plain/Cipher Section:** Two rows of 26 small square boxes. The first row is labeled "Plain:" and the second row is labeled "Cipher:".
- Encipher/Decipher Section:** A dropdown menu labeled "Encipher or Decipher? ?" and radio buttons for "Preserve word divisions?" with options "Yes" and "No" (selected). A "What is this?" button is also present.
- Input Message Section:** A large text area labeled "Input Message:".
- Output Section:** A large text area with a small "Clear" button to its left.
- Bottom Section:** A dark gray bar containing "Clear" and "Quit" buttons.

**FIGURE 2.2**

Substitution cipher Maplet showing cipher alphabet.

The image shows a Java Swing window titled "Substitution Cipher". At the top, there is a dropdown menu for "Substitution cipher type?" set to "Keyword(simple)" and a text field for "Keyword:" containing "WILLROGERS". Below this, two rows of letter boxes are displayed. The first row, labeled "Plain:", contains the standard alphabet A through Z. The second row, labeled "Cipher:", contains the keyword "WILLROGERS" followed by the remaining letters of the alphabet in order: I, L, R, O, G, E, S, A, B, C, D, F, H, J, K, M, N, P, Q, T, U, V, X, Y, Z. A button labeled "Create Alphabet Assignment" is positioned between the two rows. Below the rows, there are two controls: a dropdown menu for "Encipher or Decipher?" with a question mark icon, and a group box for "Preserve word divisions?" containing radio buttons for "Yes" and "No" (which is selected), along with a "What is this?" button. The main area of the window is divided into two large text input fields. The top field is labeled "Input Message:" on the left. The bottom field has a small, empty rectangular box to its left. At the very bottom of the window, there are two buttons: "Clear" and "Quit".

**FIGURE 2.3**

Substitution cipher Maplet after encryption.

The screenshot shows a Java Swing window titled "Substitution Cipher". At the top, there is a dropdown menu for "Substitution cipher type?" set to "Keyword(simple)" and a text field for "Keyword:" containing "WILLROGERS". Below this is a table with two rows: "Plain:" and "Cipher:". The "Plain:" row contains the alphabet A-Z, and the "Cipher:" row contains the keyword "WILLROGERS" followed by the remaining alphabet letters in order. A "Create Alphabet Assignment" button is located below the table. Further down, there is a section for "Encipher or Decipher?" with a dropdown set to "encipher" and "Preserve word divisions?" with radio buttons for "Yes" (selected) and "No", and a "What is this?" link. Below this is a large text area for the "Input Message:" containing the text "EVERYTHING IS FUNNY AS LONG AS IT IS HAPPENING TO SOMEBODY ELSE". At the bottom of the main area is another large text area for the "Encipher Message:" containing the encrypted text "OUONYQSAHE AP GTHHY WP DJHE WP AQ AP SWKKOHAHE QJ PJFOLJRY ODPO". At the very bottom of the window are two buttons: "Clear" and "Quit".

Substitution cipher type?	Keyword(simple)	Keyword:
Keyword(simple)		WILLROGERS

Plain:	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Cipher:	W	I	L	R	O	G	E	S	A	B	C	D	F	H	J	K	M	N	P	Q	T	U	V	X	Y	Z

Create Alphabet Assignment

Encipher or Decipher? encipher Preserve word divisions? ☒ Yes ☐ No [What is this?](#)

Input Message: EVERYTHING IS FUNNY AS LONG AS IT IS HAPPENING TO SOMEBODY ELSE

Encipher Message: OUONYQSAHE AP GTHHY WP DJHE WP AQ AP SWKKOHAHE QJ PJFOLJRY ODPO

Clear Quit

**FIGURE 2.4**

Substitution cipher Maplet after decryption.

The screenshot shows a Java Swing window titled "Substitution Cipher". At the top, there is a dropdown menu for "Substitution cipher type?" set to "Keyword(simple)" and a text field for "Keyword:" containing "WILLROGERS". Below this is a table with two rows: "Plain:" and "Cipher:". The "Plain:" row contains the alphabet A-Z. The "Cipher:" row contains the letters W, I, L, R, O, G, E, S, A, B, C, D, F, H, J, K, M, N, P, Q, T, U, V, X, Y, Z. A button labeled "Create Alphabet Assignment" is positioned below the table. Further down, there is a section for "Encipher or Decipher?" with a dropdown set to "decipher" and "Preserve word divisions?" with radio buttons for "Yes" (selected) and "No", and a "What is this?" link. Below this is a large text area labeled "Input Message:" containing the text "OUONYQSAHE AP GTHHY WP DJHE WP AQ AP SWKKOHAHE QJ PJFOLJRY ODPO". At the bottom of the window is another large text area labeled "Decipher Message:" containing the text "EVERYTHING IS FUNNY AS LONG AS IT IS HAPPENING TO SOMEBODY ELSE". At the very bottom, there are two buttons: "Clear" and "Quit".

Substitution cipher type?	Keyword(simple)	Keyword:
Keyword(simple)		WILLROGERS

Plain:	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Cipher:	W	I	L	R	O	G	E	S	A	B	C	D	F	H	J	K	M	N	P	Q	T	U	V	X	Y	Z

Create Alphabet Assignment

Encipher or Decipher? **decipher** Preserve word divisions? ☒ Yes ☐ No [What is this?](#)

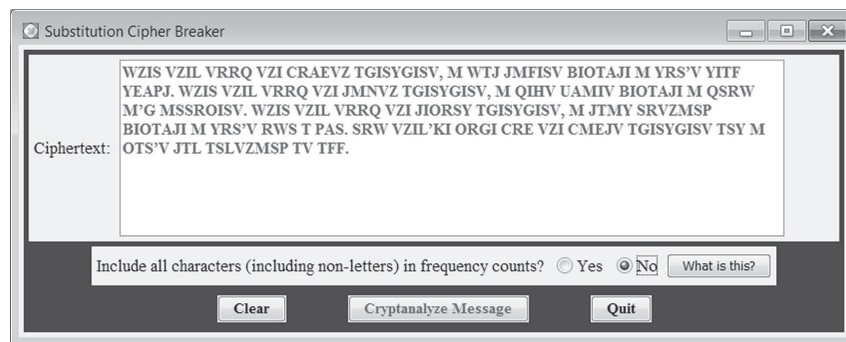
Input Message: OUONYQSAHE AP GTHHY WP DJHE WP AQ AP SWKKOHAHE QJ PJFOLJRY ODPO

Decipher Message: EVERYTHING IS FUNNY AS LONG AS IT IS HAPPENING TO SOMEBODY ELSE

Clear Quit

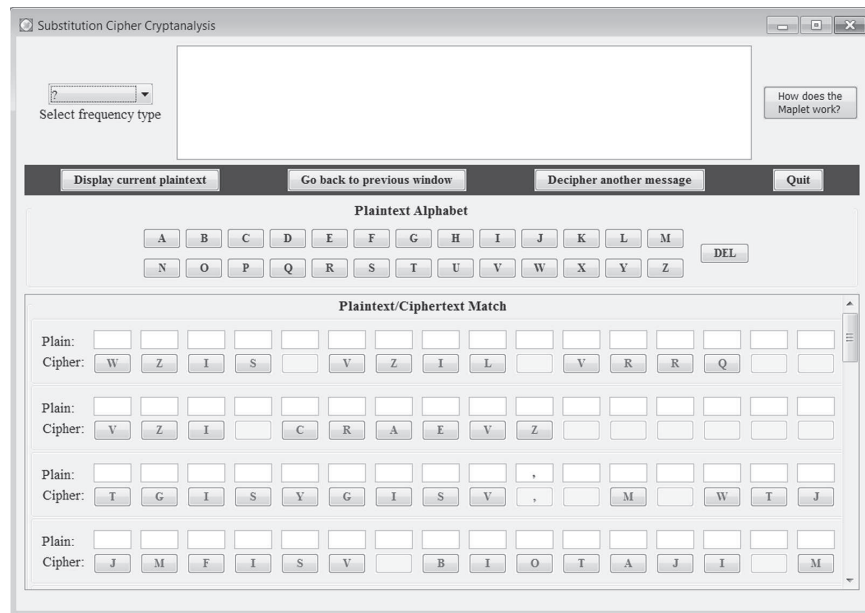
**FIGURE 2.5**

A Maplet for cryptanalysis of substitution ciphers.



**FIGURE 2.6**

Substitution cipher breaker Maplet second window.



The image shows a Java Swing window titled "Substitution Cipher Cryptanalysis". It features a "Select frequency type" dropdown menu on the left, a large empty text area in the center, and a "How does the Maplet work?" button on the right. Below these is a dark toolbar with four buttons: "Display current plaintext", "Go back to previous window", "Decipher another message", and "Quit".

The main content area is divided into two sections. The top section, titled "Plaintext Alphabet", contains a grid of buttons for letters A through Z, with a "DEL" button at the bottom right. The bottom section, titled "Plaintext/Ciphertext Match", contains four rows of input fields. Each row has a "Plain:" label followed by 15 empty text boxes, and a "Cipher:" label followed by 15 buttons. The buttons in the "Cipher:" row of each section contain the following letters: Row 1: W, Z, I, S, V, Z, I, L, V, R, R, Q; Row 2: V, Z, I, C, R, A, E, V, Z; Row 3: T, G, I, S, Y, G, I, S, V, M, W, T, J; Row 4: J, M, F, I, S, V, B, I, O, T, A, J, I, M.

FIGURE 2.7

Substitution cipher breaker Maplet with one letter assigned.

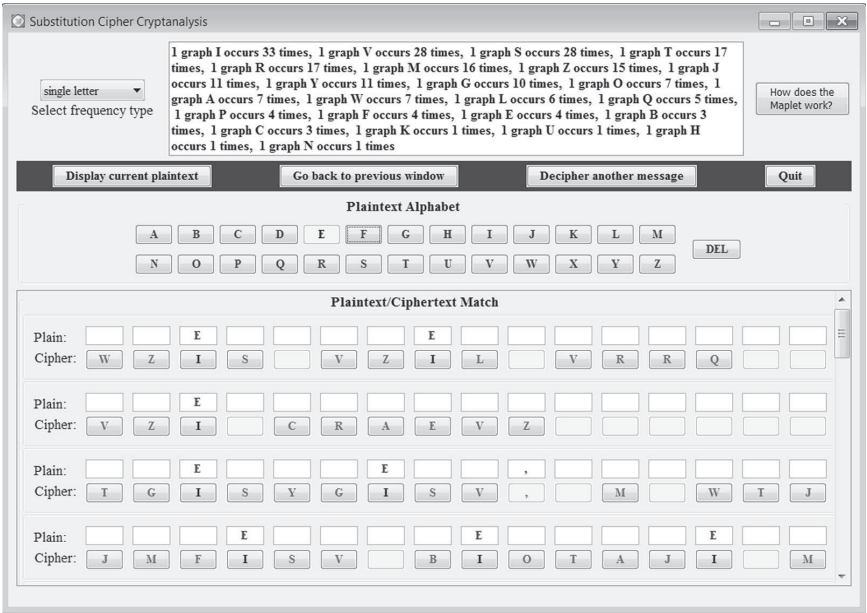
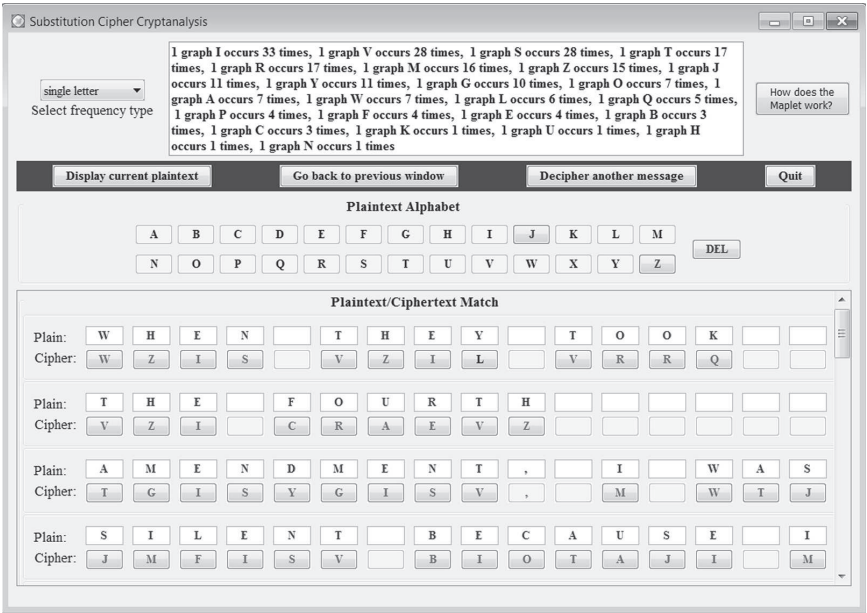


FIGURE 2.8

Substitution cipher breaker Maplet with all letters assigned.





**FIGURE 2.9**

A Maplet for Playfair ciphers.

Playfair Cipher

Encipher or Decipher a message? ?

Input Message:

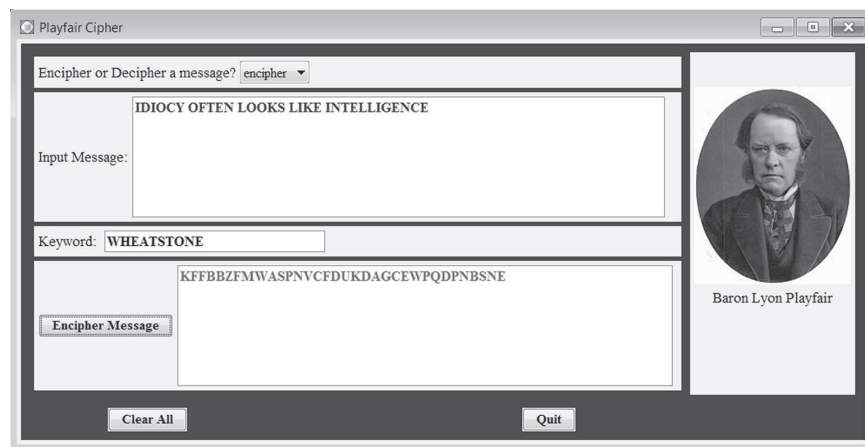
Keyword:

Baron Lyon Playfair

Clear All Quit

**FIGURE 2.10**

Playfair cipher Maplet after encryption.



**FIGURE 2.11**

Playfair cipher Maplet after decryption.

