Playfair Cipher

The Playfair cipher is an interesting cipher that replaces pairs of letters with other pairs. Simpler substitution ciphers only replace single letters. This makes hacking the encryption much harder.

Encrypting

To encrypt a message, you'll need to pre-treat it. First replace all Js with Is and remove the spaces. Secondly, split the plain text into pairs of letters. If any pair is a double letter then put an X in between them. Your pair of letters is now a triple! So take the third letter and move it into the next pair. Continue until you have only pairs. If you have a single letter at the end, add an extra X to the end to make a pair.

For example the message "Just you see" would be treated like this:

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1. JUST YOU SEE
2. IUSTYOUSEE
3. IU, ST, YO, US, EE
4. IU, ST, YO, US, EXE
5. IU, ST, YO, US, EX, E
6. IU, ST, YO, US, EX, EX
```

Take the letters two at a time from your treated plain text and apply the following rules:

- If the letters are on the same row of the grid, replace them with the letters to their right. Wrap around the table if needed.
- If the letters are in the same column, replace them with the letters below. Wrap around the table if needed.
- If the letters are on different rows and columns then replace the letters with the letter that lies on the same row but it is in the column of the other.

Repeat this method for each pair of letters in the message.

Decrypting

To decrypt a message you must go through the letters in the cipher text two by two. Apply the following rules:

- If the letters are on the same row of the grid, replace them with the letters to their left. Wrap around the table if needed.
- If the letters are in the same column, replace them with the letters above. Wrap around the table if needed.
- If the letters are on different rows and columns then replace the letters with the letter that lies on the same row but it is in the column of the other.

You may end up with a plaintext that has extra Xs in it. You can ignore those, hopefully the message still makes sense.