

Challenge 1 `balance(eq)`

Write a function that takes an unbalanced chemical reaction and balances it. For example, the input “ $C_6H_5COOH + O_2 = CO_2 + H_2O$ ” should give output “ $C_6H_5COOH + 15O_2 = 14CO_2 + 6H_2O$ ”.

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Challenge 2 `text_encipher(s, pub_key)` `text_decipher(t, priv_key)`

Write functions that encrypt and decrypt a word (string of capital letters) using the RSA method.

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Challenge 3 `taylor_figure(k)`

Write a function that plots $\cos(x)$, and the Taylor expansions around $x = 0$ using the first $1, 2, \dots, k$ terms (k approximation functions in total). Choose an appropriate color scheme that shows the increasing precision.

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Challenge 4 `all_sat(expr)`

Write a function that works like the `satisfiable()` function in `sympy.logic.inference`, except that it returns all possible satisfying assignments, for an expression in terms of two variables x, y .

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