Hacking 101

In the not-so-distant future of 2020 corporations finally take over the world. Bureaucracy increases tenfold and everyone is assigned a small, designated cubicle. With bleak and uninspiring prospects for the future, some people refuse to give up. Brave hackermen stand against rigid working hours. Some of them even bring personal belongings to their cubicles. They are able to fight the system by hacking reality. Hacks they use are very powerful and follow a few simple rules:

1. Each hack may use only specific letters: “a”, “b” and “c”. Hacks containing other letters are ineffective.

2. Each letter adds specific power to the hack:

Letter	a	b	c
Base power	1	2	3

3. Each repeated letter in a hack brings more power than its previous iteration. First instance of a letter in a hack is worth base power (for “b” it is 2), second instance of the letter is worth 2 times its base power, third instance of a letter is worth 3 times its base power, etc.

   Example: Hack “ccbc” is has 20 power. Here’s a breakdown:

Hack letter	c	c	b	c
Power	3	3 * 2	2	3 * 3

4. In addition to the power from letters, hacks can also contain special phrases. Those phrases add following values to the hack power:

Hack phrase	ba	baa
Power	10	20

5. Each hack uses the maximal power from letters and phrases. Letters always contribute to the hack power (even if they are part of a phrase) but power of phrases is exclusive (if phrases overlap — only the non-overlapping phrases generate power).

   Example: Hack “baaca” is worth 31 power. Here’s a breakdown:

Hack	b	a	a	c	a

Letter power	2	1	1 * 2	3	1 * 3
“baa” phrase power	20				

One of the hackermen was able to hack back through time to give us those rules. Now we need a hack calculator that will let us test power of new hacks.

Requirements

Write a program that calculates the power of hacks and returns the value.

Optional (extra credit): It’s possible that the list of valid letters and phrases for hacks isn’t complete. Can you describe how you would change your algorithm so it could calculate hack power for dynamically provided letters and phrases

(e.g.: “hack_calculator(hack=’advantage’, letters={'a': 1, 'd': 2, 'e': 5, 'g': 2, 'n': 1, 't': 4, 'v': 7}, phrases={‘ad’: 10, ‘ant’: 13, ‘age’: 24, ‘van’: 13, ‘tag’: 5}”)?

Technical requirements

1. Module name: “hack_power.py”
2. Name of function in module: “hack_calculator(hack: str)”

Examples

List of hack with their power values:

Hack	Power
baaca	31
babacaba	55
aabacabaaaca	81
abc	6
baad	0