

Gravity Falls Cryptogram Solver

Version 4: Combining several cipher methods!

Help Dipper and Mabel discover the secret messages by writing a program that will help you uncover the mysteries of a cipher that combines all three methods that you know:

- A1Z26 cipher
- Atbash cipher
- Caesar cipher

A combined cipher is a mix of two or more ciphers seen in the show. The first time such a cipher has been used is at the end of "Gideon Rises." It's solved by converting to letters using the A1Z26 cipher, then flipping the letters with the Atbash cipher, and finally by using the Caesar cipher ([source](#)).

Here's the message that Dipper and Mabel needed to decipher in that episode:

```
5-19-23-6-21-16 18-9-6 4-16-19 22-12-15-10-20-19-25-19
```

First, they applied the A1Z26 cipher to the message to get the following message:

```
ESWFUP RIF DPS VLOJTSYS
```

Not very readable. Next, they applied the Atbash cipher to it to get the following message:

```
VHDFUK IRU WKH EOLQGBH
```

Finally, they applied the Caesar cipher to it... and, yooahoo! The message is:

```
SEARCH FOR THE BLINDEYE
```

You will write a program that tries to decipher the message using all three methods and their combinations.

Your program doesn't need to choose the best method. It just needs to try them all. Don't worry, it will be easy for Dipper and Mabel to figure out which method is correct. Likely, there will be only one decrypted message that makes sense.

What to do

You have already implemented all user-defined functions that you need. Now, your goal is to update your `main()` function.

You can **not** add any new user-defined functions.

Your program must try to **decipher** a given message with the following ciphers and combinations:

1. Caesar cipher with shift 3
2. Atbash cipher
3. Combined: first apply Caesar cipher with shift 3, then Atbash cipher
4. Combined: first apply Atbash cipher, then Caesar cipher with shift 3
5. A1Z26 cipher
6. Combined: first apply A1Z26 cipher, then Caesar cipher with shift 3
7. Combined: first apply A1Z26 cipher, then Atbash cipher
8. Combined: first apply A1Z26 cipher, then Atbash cipher, then Caesar cipher with shift 3
9. Combined: first apply A1Z26 cipher, then Caesar cipher with shift 3, then Atbash cipher

Hints

- In order to complete requirement 3 (**Combined: first apply Caesar cipher with shift 3, then Atbash cipher**) you can call the functions in the following manner:

```
decrypted_message = decrypt_atbash(decrypt_caesar(text, 3))
```

where `text` in the above statement represents the encrypted message.

Program name

Save your program as `gravity4.py`.

Demo

<https://asciinema.org/a/6oQ7JLNggG7YRZ22DiDYTVaZZ>

Testing

To make sure your program works correctly, you should test it.

Can you figure out what the message is, in each test case?

Test Case 1

Run your program with `python gravity4.py`. Type `4-16-19 11-23-10 20-9-1-10-5-4-23-15-6-5 15-5 2-19-6-25 21-12-19-2-19-6`, then press Enter. Your program should print:

```
Caesar cipher: 4-16-19 11-23-10 20-9-1-10-5-4-23-15-6-5 15-5 2-19-6-25
21-12-19-2-19-6
Atbash cipher: 4-16-19 11-23-10 20-9-1-10-5-4-23-15-6-5 15-5 2-19-6-25
21-12-19-2-19-6
Combined: 1) Caesar; 2) Atbash cipher: 4-16-19 11-23-10
20-9-1-10-5-4-23-15-6-5 15-5 2-19-6-25 21-12-19-2-19-6
Combined: 1) Atbash; 2) Caesar cipher: 4-16-19 11-23-10
20-9-1-10-5-4-23-15-6-5 15-5 2-19-6-25 21-12-19-2-19-6
A1Z26 cipher: DPS KWJ TIAJEDWOF E BSFY ULSBSF
Combined: 1) A1Z26; 2) Caesar cipher: AMP HTG QFXGBATLCB LB YPCV RIPYPC
Combined: 1) A1Z26; 2) Atbash cipher: WKH PDQ GRZQVWDLUV LV YHUB FOHYHU
Combined: 1) A1Z26; 2) Atbash; 3) Caesar cipher: THE MAN DOWNSTAIRS IS VERY
CLEVER
Combined: 1) A1Z26; 2) Caesar; 3) Atbash cipher: ZNK SGT JUCTYZGOXY OY BKXE
IRKBKX
```

Test Case 2

Run your program with `python gravity4.py`. Type `19-2-23-11-18-17 12-22 9-24-17!`, then press Enter. Your program should print:

```
Let's try all the methods we have:
```

```
Caesar cipher: 19-2-23-11-18-17 12-22 9-24-17!  
Atbash cipher: 19-2-23-11-18-17 12-22 9-24-17!  
Combined: 1) Caesar; 2) Atbash cipher: 19-2-23-11-18-17 12-22 9-24-17!  
Combined: 1) Atbash; 2) Caesar cipher: 19-2-23-11-18-17 12-22 9-24-17!  
A1Z26 cipher: SBWKRQ LV IXQ!  
Combined: 1) A1Z26; 2) Caesar cipher: PYTHON IS FUN!  
Combined: 1) A1Z26; 2) Atbash cipher: HYDPIJ OE RCJ!  
Combined: 1) A1Z26; 2) Atbash; 3) Caesar cipher: EVAMFG LB OZG!  
Combined: 1) A1Z26; 2) Caesar; 3) Atbash cipher: KBGSLM RH UFM!
```

Test Case 3

Run your program with `python gravity4.py`. Type `ESWFUP RIF DPS VLOJTSYS`, then press Enter. Your program should print:

```
Let's try all the methods we have:  
Caesar cipher: BPTCRM OFC AMP SILGQPVP  
Atbash cipher: VHDFUK IRU WKH EOLQGHBH  
Combined: 1) Caesar; 2) Atbash cipher: YKGXIN LUX ZNK HROTJKEK  
Combined: 1) Atbash; 2) Caesar cipher: SEARCH FOR THE BLINDEYE  
A1Z26 cipher: ESWFUP RIF DPS VLOJTSYS  
Combined: 1) A1Z26; 2) Caesar cipher: BPTCRM OFC AMP SILGQPVP  
Combined: 1) A1Z26; 2) Atbash cipher: VHDFUK IRU WKH EOLQGHBH  
Combined: 1) A1Z26; 2) Atbash; 3) Caesar cipher: SEARCH FOR THE BLINDEYE  
Combined: 1) A1Z26; 2) Caesar; 3) Atbash cipher: YKGXIN LUX ZNK HROTJKEK
```

Submitting

Submit `gravity4.py` via eClass.

You may submit either all versions you complete, or only the final version.