Your task is to use PyTorch to implement and train a neural network to execute four simple functions on a sequence of letters.

Your input will be of the form, "[function] [lowercase letters ...]" and your output will always be a single letter.

The four functions are described as follows:

(1) first: Output the first letter of the sequence.

e.g., "first d f j k l m n o p" --> d

"first f z r u k m" --> f

(2) last: Output the last letter of the sequence.

e.g., "last d f j k l m n o p" --> p

"last f z r u k m" --> m

(3) freq: Output the most frequent character in the sequence. (Assume there will always be only one answer).

e.g., "freqd f j k f m f o p" --> f

"freq f r r u k m" --> r

(4) next: Output the character in the alphabet that follows last character in the sequence

(For 'z' it should be 'a').

e.g., "next a r l m n o" --> p

"next q s l t n v" --> w

Your code should have a `predict` function that takes as input a string and outputs the next letter.

Please feel free to use any online resources/existing implementations that you'd like. This exercise should take no more than 1 - 2 hours of your time. Make sure that you use PyTorch and document your code.