(Don’t write code for the following – just give me a couple sentences of explanation).

**1.What changes would you make to your algorithm to improve performance?**

Find patterns for number of Es for numbers. Such as 13,14,15…, numbers which ends with ‘teen’ have 2 ‘e’s, or numbers over 100 have 1 ‘e’(Hundred). In this way, we do not have to transfer numeric values to word strings.

**2.What changes would you make to deal with other written languages?**

I did one with R using an R package ‘English’. But it does not have the type ‘Dictionary’ …

*library(english)*

*countEs <-function (x,y)*

*{*

*a=as.character(english(x:y))*

*b=sapply(a, function(x) sum(unlist(strsplit(x,""))=="e" ) )*

*}*

*c=countEs(1,5)*

**3.What changes to the functional requirements could you foresee arising in the future, and what would you do to prepare?**

1. Count for other letters instead of E?
2. Count for numbers larger than 999?
3. Numbers are not continuous, but a fixed gap instead such as 1,3,5,7,9….

The first one is very easy to deal with, we just change the parameter ‘e’ to other letters in the corresponding place of a function.

The second one could be hard when the code is based on the ‘e’ appearance pattern as I described in question 1. That’s also why I transferred numbers to words in my code and did not think too much about the patterns when I wrote my code.

The third change that may have

I also considered the third question when I wrote my code, we can change the parameter ‘step’ rather than using a fixed value ’step=1’. For example:

*from num2words import num2words*

*def closed\_range(start, stop, step):*

*dir = 1 if (step > 0) else -1*

*num = int( (stop + 1)/step -(start + 1)/step +1)*

*return range(start, stop + dir, step),num*

*def countEs (a,b,step):*

*ms = [num2words(i) for i in list(closed\_range(a,b,step)[0])]*

*ab=[ms[i].count('e') for i in range(closed\_range(a,b,step)[1])]*

*ans\_dict = {}*

*for i in range(len(ab)):*

*ans\_dict[list(closed\_range(a,b,step))[0][i]] = ab[i]*

*return ans\_dict*

*#try example, gap=3, count Es from 500 to 505 (That would be 500, 503)*

*ans=countEs(500,505,3)*

Thanks,

Jiaying