

Midterm 2 Preparation 2

- (1) Use list or set comprehension to generate
 - (a) the set of all square numbers up to 1000000 (which happens to be the square of 1000) that have last digit 5.
 - (b) the set of all numbers that can be written as the product of two numbers smaller than 100 that both end in the last digit 5.
 - (c) the set of all numbers that can be written as the product of three different numbers where each of these numbers is less than 10.
- (2) Use dictionary comprehension to create a dictionary that contains all key-value pairs where the key is an English letter (those in `string.ascii_letters`) and the value is zero. The dictionary should start with `{'a':0, 'A':0, ... }`.
- (3) Write a function that checks that at least one letter in a string is an English letter, (i.e. in `string.ascii_letters`). The function needs to return a Boolean value.
- (4) Write a function that counts all lines, all words, and all English letters (those in `string.ascii_letters`) in a file whose name is the only argument of the function. The function returns all of these counts. You should not count lines that are empty (i.e. only contain the character for newline) nor words that do not contain a single letter. You can of course use the previous function.
- (5) Write a function of a single argument, a file name. The function opens the corresponding file and prints out all integers in the file. Since we do not want punctuation marks to hide an integer, you need to strip punctuation from each word. You can use `string.punctuation` for this. You need to use an exception to check whether a stripped word can be made into an integer.