

Make Up Midterm

Select 5 of the following questions.

- (1) Implement a function of a single variable x that returns $\frac{x^2 - x}{x^2 - 1}$ if $x > 1$ or $-1 < x < 1$, that returns $\frac{1}{2}$ if $x = 1$ and that returns $\frac{x - x^2}{x^2 - 1}$ if $x \leq -1$.
- (2) Implement a function that takes a list and returns another list consisting of those elements in the first list that appear at least twice in the first list. The result does not have double elements. For example, given input [1,2,3,4,5,6,7,8,9,8,7,6,5,6,7,8,9], the function returns the list [5,6,7,8].
- (3) Implement a function that takes as input a string and that returns the same string, but with all occurrences of the letters 'a', 'e', and 'i' removed. Your function is not allowed to use delete or remove.
- (4) Use set comprehension to generate the set of all square numbers between 1 and 100000 whose last digit is 5. The set contains 5, 60025, and 4225 and a total of 100 elements.
- (5) Write a function that opens a csv file. Each line of the csv file contains a few numbers separated by commas. The function then creates a txt file that contains the sum of the numbers for each line in the csv file. For example, if the csv file contains
1, 3, 5, 7
2, 4, 10
12, 24
3, 8
then the txt file would become
16
16
36
11.
- (6) Write a function that opens a text file. The function returns the number letters 'a' in the file.
- (7) Write a function that uses raising and handling an exception to see whether its sole argument can be converted into a floating point number.
- (8) Write a function that selects a secret random number between 1 and 100. The function then repeatedly asks the user to guess the secret number. After the user has made a guess, the function tells the user whether the guess is too low or too high. The function terminates with a congratulatory phrase if the user has guessed the correct number.