

# Topics in Applied Mathematics Exercise

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1. Create a list of ten random integers.
  - (a) Print all elements at even indices.
  - (b) Print all even elements.
  - (c) Print all elements in reverse order.
  - (d) Print the first and last elements.
2. Create an empty list, then take a number as input and add it to the list if it is not already there. Also, print the list and terminate the program when the list contains 10 elements.
3. Write a program that adds all numbers from 2 to 10,000 to a list. Then, remove all multiples of 2, all multiples of 3, ..., and all multiples of 100. Afterward, print the remaining numbers.
4. Write a Python function that returns a list with the smallest value removed from the given list, without using the Python functions `min` and `remove`.
5. Write a Python function that returns the alternating sum of all elements in a list.  
Example:  $[1, 2, 3, 4, 5] \rightarrow$  returns  $1 - 2 + 3 - 4 + 5$ .
6. Write a Python function that returns the elements of a list in reverse order.
7. Write a function that takes a tuple of integers as an argument and returns a new tuple containing only the even integers from the original tuple.
8. Write a function that takes a dictionary where the keys are names of students and the values are their grades. The function should return a new dictionary containing only the students who have a grade of 70 or above.