CTA - Week 6 - More Algorithms, More Homework

Dominic Carr

Complete the incomplete problems on paper and try to code a solution if you feel able to do so. For the problems which have an algorithm given code the solution as best you can.

1. Given a list of numbers return a new list with only the elements of the first list that have a value > 1000

```
input: list of numbers
output: list of numbers where each value is > 1000

function filter(list of numbers)
        create new empty list
        for all elements in list
                if current element > 1000
                        add element to new list

        return new list
```

2. Write a method which produces a new string which is the merge of both strings. For example the strings "dmnc" and "oii" would merge to become "dominic". The basic step is to combine the current character from the first and second strings together in that order, so first that would be 'd' and 'o', then 'm' and 'i'.

   The second string will always be shorter and when we are finished with it the remainder of the first string will be the last part of our new string.

```
input: two strings, the second is always shorter
output: a string which is the merge of both inputs

function merge(string first, string second)
        create new blank string
        for all numbers 0 up to the length-1 of the second
                add to new string first[current] + second[current]
        for all numbers (second length - 1) upto length-1 of first
                add to new string the remaining characters at first[current]

        return the merged string
```

3. Given a string return true if the first instance of 'x' in the string is followed by another x.

```
input: a string
output: boolean indicating is the condition was met or not

function doubleX(string)
        for 0 upto string length - 2
                if the current index and the next one both contain x
                        return true
```

```
8                 else if the current index contains x
9                     return false
10          return false in the case where string was empty
```

4. Given an array of ints of odd length, return a new array length 3 containing the elements from the middle of the array. The array length will be at least 3.

5. Given an array of ints length 3, figure out which is larger, the first or last element in the array, and set all the other elements to be that value. Return the changed array.

6. Given an int array length 2, return true if it contains a 2 or a 3.