Worksheet for Lab #3 Ex2: Subsequence

http://www.comp.nus.edu.sg/~cs1010/labs/2016s1/lab3/1D_arrays.html

Task Statement

Given a list, a ***k*-interval subsequence** is a sublist where each element in the subsequence is *k* positions away from the next element in the subsequence.

You are to find the maximum sum of a *k*-interval subsequence among all *k*-interval subsequences. The answers required are the best subsequence's sum, interval *k*, and starting position, to be stored in the 3-element integer array **answers**. If there are ties, the subsequence with the smallest value of *k* should be reported.

Question 1
What is the range of values for *k*, if *size* is the number of elements in the list?

Answer: _____

Question 2
What is a good subsequence to choose to obtain the initial values for the answers?

Answer: _____

You are given the function:

```
void subsequence(int arr[], int size, int ans[])
```

Let's fill in the pseudo-code for this function, bit by bit.

Step 1: Initialising the solution
Write out the pseudo-code for the subsequence you have choose in question 2 above. Call this pseudo-code P1.

```
ans[0] ← ?          // ans[0] contains the max sum of the subsequence
ans[1] ← ?          // ans[1] contains the interval k
ans[2] ← ?          // ans[2] contains the start position of the subsequence
```

Step 2: Sum of a *k*-interval subsequence

Suppose you are given a particular value of *k*, how would you compute the sum of every *k*-interval subsequence in the list, and update the answers if necessary?

Question 3

For a particular value of *k*, how many *k*-interval subsequences are there in a list of *size* elements?

Answer: _____

Write out the pseudo-code to compute the sum of every *k*-interval subsequence (for a particular value of *k*) and update the answers if necessary. Call this pseudo-code P2.

The above pseudo-code P2 examines all *k*-interval subsequences for a particular value of *k*. Write the pseudo-code below to include all *k*-interval subsequences for all values of *k*, except the value of *k* which is used in pseudo-code P1 to find the initial values for the answers. In the pseudo-code below, you may use P2 to substitute the whole pseudo-code P2.