**Assignment 4**

**Question 1**

In the Binary Search algorithm, it is suggested to calculate the mid as beg + (end - beg) / 2 instead of (beg + end) / 2. Why is it so?

* You are correct that the problem the second form tries to avoid is overflow, attempting to represent a number that is larger than the maximum representable number.
* There is no restriction on how large the individual numbers beg and end are, so potentially they can both be larger than half of the maximum representable number. Adding them means that the intermediate result (beg+end) can overflow.
* The second solution seems to eliminate the risk of overflowing, but introduces another one. If the values are signed values, their difference can again overflow (or underflow, depending on their signs). Unsigned values have no problem.

**Question 2**

Write the algorithm/function for Ternary Search.

* First, we compare the key with the element at mid1. If found equal, we return mid1.
* If not, then we compare the key with the element at mid2. If found equal, we return mid2.
* If not, then we check whether the key is less than the element at mid1. If yes, then recur to the first part.
* If not, then we check whether the key is greater than the element at mid2. If yes, then recur to the third part.
* If not, then we recur to the second (middle) part.