1. Integer range is -2,147,483,648 to 2,147,483,647. If you are searching in an array of size 2,000,000,000 and the element searched for is located at index 1,999,999,999. When you search in the upper half of array, beg=1,000,000,001 and end=2,000,000,000. If mid is calculated as (low+high)/2, low+high = 3,000,000,001; which exceeds the range of int, resulting in overflow errors. But mid calculated as beg + (end-beg) = 1,000,000,001 + 999,999,999 = 2,000,000,000; which fits in the integer range.
2. Begin

   if start <= end then

      midFirst := start + (end - start) /3

      midSecond := midFirst + (end - start) / 3

      if array[midFirst] = key then

         return midFirst

      if array[midSecond] = key then

         return midSecond

      if key < array[midFirst] then

         call ternarySearch(array, start, midFirst-1, key)

      if key > array[midSecond] then

         call ternarySearch(array, midFirst+1, end, key)

      else

         call ternarySearch(array, midFirst+1, midSecond-1, key)

   else

      return invalid location

End