

**QUESTION - 1:**

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

**SOLUTION :**

Exactly. There's no guarantee that  $\text{beg} + \text{end}$  is representable; but in the second case the intermediate values, as well as the expected result, are no larger than  $\text{end}$ , so there is no danger of overflow.

The second form can also be used for affine types like pointers and other random-access iterators, which can be subtracted to give a distance, but not added together.