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?

Answer::>

Exactly. There's no guarantee that beg+end is representable; but in the second case the intermediate values, as well as the expected result, are no larger than 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.