ASSIGNMENT-4

(1) It is mainly used to avoid overflow. Consider an example where the data type of the low and high is integer. So integer has an upper range of 65535 if it is an unsigned integer. Now consider the value of low as 1000 and high as 65000. Now if we calculate mid as (low + high)/2, it will give wrong result due to overflow of integer data type. Now if we calculate mid as low + (high - low)/2, it will give us a correct answer.

(2)

```
int ternarySearch(int l, int r, int key, int ar[])
{
    if (r >= l) {
        int mid1 = l + (r-l)/3;
        int mid2 = r - (r-l)/3;
        if (ar[mid1] == key) {
            return mid1; }
        if (ar[mid2] == key {
            return mid2; }

        if (key < ar[mid1]) {
            return ternarySearch(l, mid-1, key, ar); }
    else if (key > ar[mid2]) {
        return ternarySearch(mid2+1, r, key, ar); }
    else {
        return ternarySearch(mid1+1, mid2-1, key, ar);
        }
    }
    return -1;
}
```