

9. Write a recursive java method for binary search. You may assume that the sequence of data has already been sorted in ascending order. The method returns the index of the target in the sequence or -1 if the target is not found. [8 Marks]

```
/*data: the data sequence  
low and high: the lower and higher end of the searching range,  
which means searching within data[low] and data[high]  
key: target to search  
*/  
int binarySearch(int[] data, int low, int high, int key)  
{  
    //check the parameters  
    //If not satisfied, print an error message and return -1
```

```
    if (data[low] == key) return low;  
    else if (data[high] == key) return high;  
    else if (high - low <= 1 && data[high] != key && data[low] != key) return -1;  
    else if (data[(low + high) / 2] > key)  
    {  
        return binarySearch(int[] data,  
        high = (low + high) / 2;  
        return binarySearch (int[] data, int low, int high, int key);  
    }  
    else if (data[(low + high) / 2] < key)  
    {  
        low = (low + high) / 2;  
        return binarySearch (int[] data, int low, int high, int key);  
    }  
}
```

10. Given a recursive method below,

```
Int produce(num)  
{  
    If(num>10) return 10;  
    Else return num+produce(num+1)/2;  
}
```