

1. Consider the following code:

```
public static void process (Integer a[], int liminf, int limsup) {  
    int i=liminf ;  
    int j=limsup-1 ;  
    while (i < j) {  
        int temp=a[i] ;  
        a[i]=a[j] ;  
        a[j]=temp ;  
        i++ ;  
        j-- ;  
    }  
}  
  
public static void example (Integer a[], int li, int ls) {  
    if (li < ls) {  
        process (a,li,ls);  
        ls=ls/2;  
        example (a,li,ls);  
    }  
}
```

Explain what the methods above do and present the result applied to the array $a[8]=\{6,1,4,2,7,3,1,5\}$, $li=0$, $ls=8$, $example(a,0,8)$.

2. Develop recursive methods that permit:

- a) Calculate the sum of two positive integer numbers.
- b) Convert a decimal integer n to a binary representation.
- c) Verify if a positive integer is prime.
- d) Verify if a word is palindrome. A word, phrase, or other sequence of symbols or elements, whose meaning may be interpreted the same way in either forward or reverse direction: ANA, SOPAPOS.