ANALYSIS & DESIGN OF ALGORITHIM

PRACTICAL-1

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IN-LAB:

1)

x = input().split()

x.sort(key=lambda k:len(k))

print(" ".join(x))

```
1  x = input().split()
2  x.sort(key=lambda k:len(k))
3  print(" ".join(x))
```

Status Successfully executed   **Date** 2021-07-08 04:39:49   **Time** 0.02 sec   **Mem** 17.968 kB   ✖

Input

```
You are beautiful looking
```

Output

```
You are looking beautiful
```

2)

```python
def convertToBinary(n):

    bin_string = ""

    if n > 1:

        bin_string += convertToBinary(n//2)

    bin_string += str(n % 2)

    return bin_string


x = [int(y) for y in input().split()]

x.sort(key=lambda n:convertToBinary(n).count("1"),reverse=True)

print(x)
```

```python
1 ▾ def convertToBinary(n):
2       bin_string = ""
3 ▾     if n > 1:
4           bin_string += convertToBinary(n//2)
5       bin_string += str(n % 2)
6       return bin_string
7
8   x = [int(y) for y in input().split()]
9   x.sort(key=lambda n:convertToBinary(n).count("1"),reverse=True)
10  print(x)
```
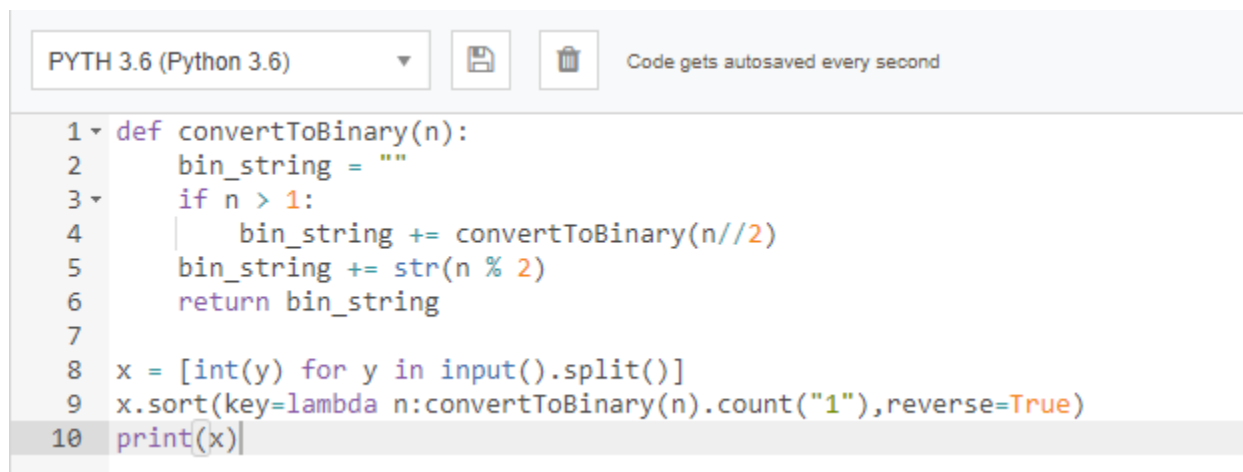
Input

```
1 2 3 4 5 6
```

Output

```
[3, 5, 6, 1, 2, 4]
```

3)

```
n = int(input())

print(n*(n+1)//2)


ans = 0

for i in range(n+1):

  ans+=i

print(ans)


ans = 0

for i in range(n+1):

   for j in range(i):

     ans += 1

print(ans)
```

```python
1  n = int(input())
2  print(n*(n+1)//2)
3
4  ans = 0
5  for i in range(n+1):
6      ans+=i
7  print(ans)
8
9  ans = 0
10 for i in range(n+1):
11     for j in range(i):
12         ans += 1
13 print(ans)
```

Status Successfully executed **Date** 2021-07-08 04:42:48 **Time** 0.02 sec **Mem** 17.968 kB   ✖

Input

```
10
```

Output

```
55
55
55
```

POST-LAB:

1)

```java
import java.util.*;
public class Main
{
 public static void main(String[] args) {
    String arr[] = {"poiNtEr", "aRRAy", "cOde", "foR"};
    int a[]=new int[arr.length];
    for(int i=0;i<arr.length;i++){
      a[i]=count(arr[i]);
    }
    sort(a,arr,arr.length);
       for(int i=0;i<arr.length;i++){
      System.out.println(arr[i]+" "+a[i]);
    }
 }
public static int count(String a){
   int count=0;
   for(int i=0;i<a.length();i++){
   if(a.charAt(i)>='A'&&a.charAt(i)<='Z')
     count++;
  }
   return count;
}
 public static void sort(int arr[],String b[],int n){
```

```
for (int i = 0; i < n-1; i++)

    for (int j = 0; j < n-i-1; j++)

      if (arr[j] > arr[j+1])

      {

         // swap arr[j+1] and arr[j]

         int temp = arr[j];

         arr[j] = arr[j+1];

         arr[j+1] = temp;


         String temp1 = b[j];

         b[j] = b[j+1];

         b[j+1] = temp1;

      } }}
```

JAVA (HotSpot 8u112)   ▼   💾   🗑   Code gets autosaved every second   ⓘ   ⤓   ↗   ⚙

```
1   import java.util.*;
2   public class Main
3 ▾ {
4 ▾   public static void main(String[] args) {
5
6         String arr[] = {"poiNtEr", "aRRAy", "cOde", "foR"};
7         int a[]=new int[arr.length];
8 ▾      for(int i=0;i<arr.length;i++){
9            a[i]=count(arr[i]);
10        }
11
12        sort(a,arr,arr.length);
13
14 ▾      for(int i=0;i<arr.length;i++){
15           System.out.println(arr[i]+" "+a[i]);
16        }
17     }
18 ▾  public static int count(String a){
19        int count=0;
20 ▾      for(int i=0;i<a.length();i++){
21        if(a.charAt(i)>='A'&&a.charAt(i)<='Z')
22           count++;
23
24        }
25        return count;
26     }
27 ▾   public static void sort(int arr[],String b[],int n){
28        for (int i = 0; i < n-1; i++)
```

33:38   ↻

Status Successfully executed   **Date** 2021-07-30 09:29:32   **Time** 0.07 sec   **Mem** 2184.192 kB   ✖

Output

```
cOde 1
foR 1
poiNtEr 2
aRRAy 3
```

2)

$$T(n) = T(n/2) + O(1)$$