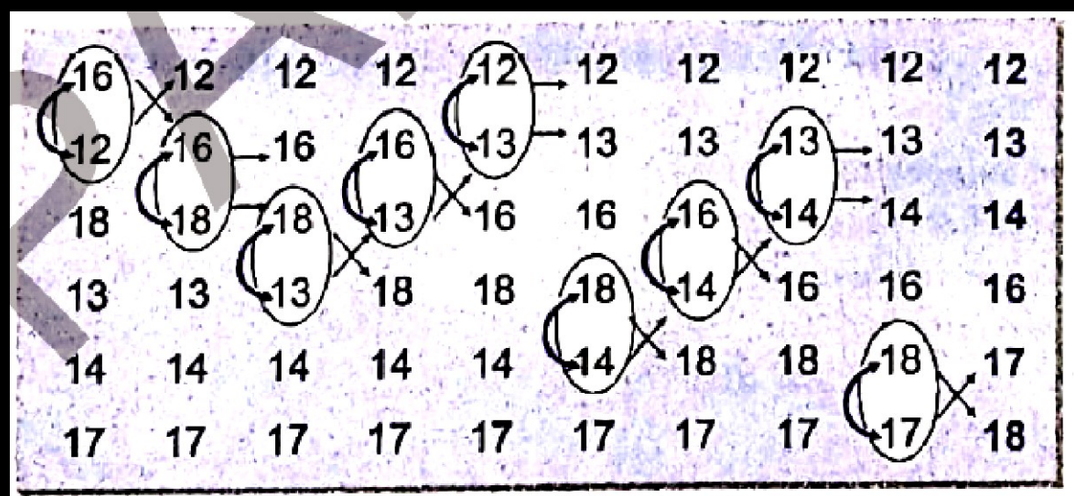
Sorting Techniques

Sorting Techniques

- Sorting in computer terms means arranging elements in a specific order-arranging or increasing order or disc ending or decreasing order.
- There are mutable ways or techniques or algorithms that you can apply to sort a group of elements such as selection sort, insertion short, bubble sort, heap sort, quick sort etc

Bubble Sort

- The basic idea of bubble short is to compare to AD joining values and exchange them if they are not in proper order.
- To understand this, have a look at fig 2.3 that visually explains the process of bubble short



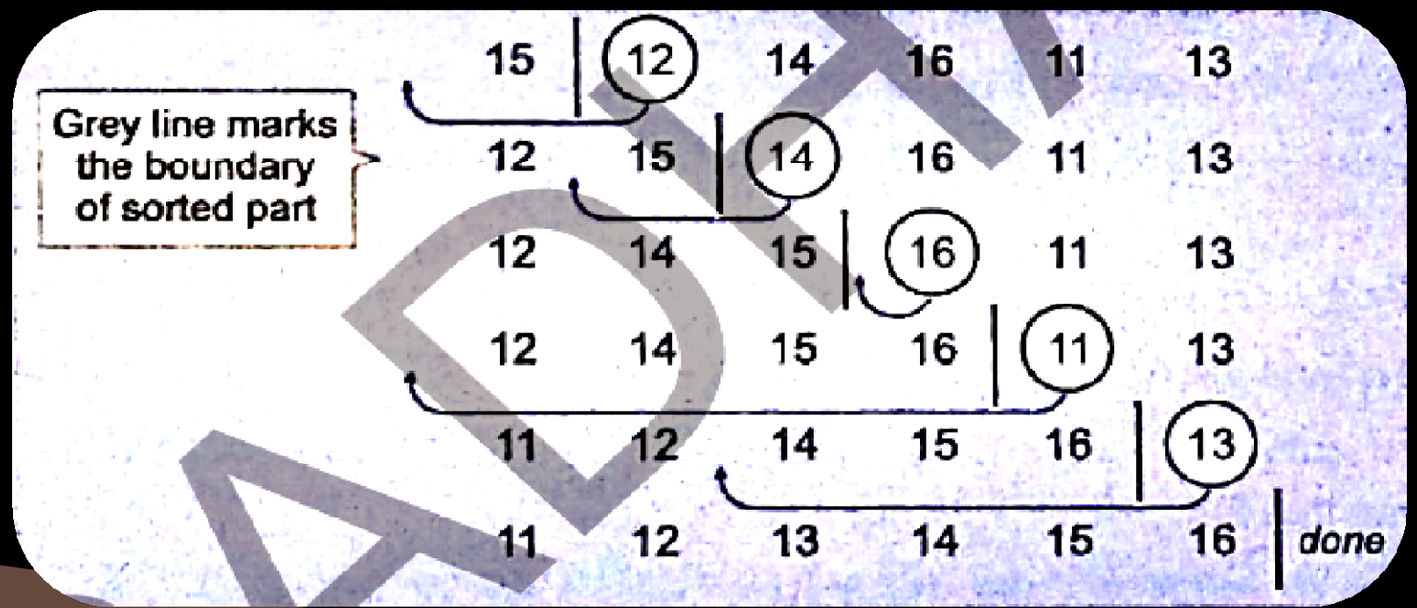
085 BUBBLE SORT

- Program to start a list using bubble shot.

```
aList =[15,6,13,22,3,52,2]
print("Orignal list is :", aList)
n = len(aList)
for i in range(n):
    for j in range(0, n-i-1):
        if aList[j] > aList[j+1] :
            aList[j], aList[j+1] = aList[j+1], aList[j]
print("List after sorting is :", aList)
```

Bubble Sort

- **Insertion sort**
- Insertion short in a certain algorithm that builds are shorted list one element at a time from the unsorted list by inserting the element at its correct position in shortlist.



Bubble Sort

- Program to sort A sequence using in certain sort.

086 INSERTION SORT

```
aList  = [15,6,13,22,3,52,2]
print ("Original list is :", aList)
for i in range(1,len(aList)):
    key = aList[i]
    j = i-1
    while j >= 0 and aList[j] > aList[j+1]:
        aList[j+1] = aList[j]
        j = j-1
    else:
        aList[j+1] = key
print("List after sorting : ", aList)
```

Solved Problems

Solved Problems

4. consider the following code:

- What will be the output produced if the input is:
- (I) aabbcc
- (ii) aaccbb
- (iii) abcc

```python
string = input("Enter a string: ")
count = 3
while True:
    if string[0] == 'a' :
        string = string[ 2 : ]
    elif string[-1] == 'b' :
        string = string[ : 2 ]
    else:
        count += 1
        break
print(string)
print(count)
```

087 SOLVED PROBLEMS

Solved Problems

5.Consider the following code :

- What will be the output produced if the input is
- (i) 1bzz,
- (ii) ‘1a’
- (iii) ‘abc’
- (iv) ‘Oxy’
- (v) ‘Xyz’

088 SOLVED PROBLEMS

```
inp = input("Please enter a number : ")
while len (inp) <= 4 :
    if inp [-1] == 'z' :
        inp = inp[0 : 3] + 'c'
    elif 'a' in inp :
        inp = inp[0] + 'bb'
    elif not int(inp[0]) :
        inp = '1' + inp[1 : ] +'z'
    else:
        inp = inp = '*'
print(inp)
```

Solved Problems

- 6. write a program that takes a string with multiple words and then capitalization the first letter of each word and phones in new string out of it.

```
string = input("Enter a string: ")
length = len(string)
a = 0
end = length
string2 = ''
while a <= length:
    if a == 0 :
        string2 += string[0].upper()
        a += 1
    elif (string[a] == string[a+1]):
        string2 += string[a]
        a += 1
print(" Original string : ", string)
print("Capitalized words string ", string2
```

089 SOLVED PROBLEMS

Solved Problems

- 7. write a program that reads a string and checks weather it is a palindrome string are not.

```python
string = input("Enter a string : ")
length = len(string)
mid = length/2
rev = -1
for a in range(mid) :
    if string[a] == string[rev] :
        a += 1
        rev -= 1
    else :
        print(string,"is not a palindrome")
        break
else:
    print(string,"is a palindrome")
```

090 SOLVED PROBLEMS

Solved Problems

- 13. What will be the output of the following code snippet?

091 SOLVED PROBLEMS

```
values = []
for i in range (1,4) :
    values.append(i)
    print(values)
```

Solved Problems

- 14. What will be the output of the following code?

  (a) True

  (b) False

  (c) 0

  (d) 1

092 SOLVED PROBLEMS

```
rec = {"Name":"Python", "Age" : "20"}
r = rec.copy()
print(id(r) == id(rec))
```

Solved Problems

- 15. what will be the output of the following code snippet?

```
dc1 = {}
dc1 [1] = 1
dc1['1'] = 2
dc1[1.0] = 4
sum = 0
for k in dc1:
    sum += dc1[k]
print(sum)
```

093 SOLVED PROBLEMS

Solved Problems

- 16. predict the output of following code fragment:
- Solution :
- {'Apple’ : 1}
- {'Apple‘ : 1,‘Banana’ : 1,}
- {'Apple : 1, ‘Banana’ : 1,'Apple : 1}
- {'Apple : 1, ‘Banana’ : 2,'Apple : 1}
- 3

094 SOLVED PROBLEMS

```
fruit = {}
f1 = ['Apple','Banana','apple','banana']
for index in f1 :
    if index in fruit :
        fruit[index] += 1
    else:
        fruit[index] = 1
    print(fruit)
print(len(fruit))
```

Solved Problems

- 18. find the error in the following code fragment. State the reason behind the error.

```
box = {}
jars = {}
crates = {}
box['biscuit'] = 1
box['cakes'] = 3
jars['jam'] = 4
crates['box'] = box
crates['jars'] = jars
print(crates)
```

095 SOLVED PROBLEMS

Solved Problems

- 22. following code is trying to create a tuple with a single item.
- But when we try to obtain the length of the tuple is, python gives error.
- Why? What is the solution?

096 SOLVED PROBLEMS

```
t = (6,)
t = (6,)
print(len(t))
```

Solved Problems

- 31. Consider a dictionary my points with single-letter keys, each followed by a 2-element tuple representing the coordinates of a point in an x-y coordinate plan.
- My point = {'a' : (4, 3) , 'b' : (1, 2) , 'c' : (5, 1) }
- Write a program to calculate the maximum value from within all of the value tuples at same index.

```python
my_points = {'a': (4,3),'b':(1,2),'c':(5,1)}
highest = [0,0]
init = 0
for a in range(2) :
    init = 0
    for b in my_points.keys():
        val = my_points[b][a]
        if init == 0:
            highest[a] = val
        init += 1
        if val > highest[a]:
            highest[a] = val
    print("maximum value at index(my-points,",a,") = ", highest[a])
```

097 SOLVED PROBLEMS