ARRAY

P-1
```
import array as a
arr = a.array('i', {11,12,13,14,15,16,17,18,19,20})
for i in arr :
    print(i)
```

P-2
```
import array as arr
# Create array
a = arr.array('i', [2, 5, 62, 42, 52, 48, 15])

# create array with list
#list1 = [2, 5, 62, 5, 42, 52, 48, 15]
# a = arr.array('i', list1)



print("First element:", a[0])
print("Second element:", a[1])
print("Second last element:", a[-1])

# range
print(a [2:5])
print(a[:-5])
print(a[5:])
print(a[:])

# append method insert value at last position
a.append(100)
print(a)

# insert value at position
a.insert(3,200)
print(a)

# pop
print(a.pop())
print(a)

print(a.pop(2))
print(a)

# index
print(a.index(42))

# reverse
a.reverse()
```

```
    print(a)

# remove
a.remove(5)
print(a)


P-3

import array as a
arr  = a.array('i', { {11,12,13},{14,15,16},{17,18,19},{20,21,22} })  # 2D ARRAY
for i in arr :
    print(i)
```

SEARCHING

Write a python script for **Binary search**

```python
def binary_search(item_list,item):
        first = 0
        last = len(item_list)-1
        found = False
        while( first<=last and not found):
                mid = (first + last)//2
                if item_list[mid] == item :
                        found = True
                else:
                        if item < item_list[mid]:
                                last = mid - 1
                        else:
                                first = mid + 1
        return found

# number of list element
n = int(input("Enter number Array Element Value"))
# empty list element created
arr =[]
for i in range(n):
        a = input("Enter Value :")
        arr.append(a) # element add in list

# input search value from user
b = input("Enter search value:")

print(binary_search(arr,b))
```

Write a python script for **Linear search**

```python
def linear_search(item_list,item):
        found = False
        i=0
        while(i<len(item_list)):
                if item_list[i] == item :
                        found = True
                        break
                else :
                        i=i+1
        return found

# number of list element
n = int(input("Enter number Array Element Value: "))

# empty list element created
arr =[]
for i in range(n):
        a = input("Enter Value :")
        arr.append(a) # element add in list

# input search value from user
b = input("Enter search value:")
print(linear_search(arr,b))
```

Write a python script for Bobble Sort

```python
def bobble_sort(item_list):
    for i  in range(0,len(item_list)) :
        for j in range(0,len(item_list)-1) :
            if item_list[j] > item_list[j+1] :
                temp = item_list[j]
                item_list[j] = item_list[j+1]
                item_list[j+1] = temp


# number of list element
n = int(input("Enter number Array Element Value : "))
# empty list element created
arr =[]
for i in range(n):
    a = int(input("Enter Value :"))
    arr.append(a) # element add in list

# input value from user
print("Before Sorting Element")
print(arr)
bobble_sort(arr)
print("After Sorting Element")
print(arr)
```

Write a python script for insert Sort

```python
def insert_sort(item_list):
    for i in range(1,len(item_list)) :
        for j in range(i-1,-1,-1) :
            if item_list[j] > item_list[j+1] :
                temp=item_list[j]
                item_list[j]=item_list[j+1]
                item_list[j+1]=temp
            else:
                break

# number of list element
n = int(input("Enter number Array Element Value : "))
# empty list element created
arr =[]
for i in range(n):
    a = int(input("Enter Value :"))
    arr.append(a) # element add in list

# input search value from user
print("Before Sorting Element")
print(arr)
insert_sort(arr)
print("After Sorting Element")
print(arr)
```

Write a python script for QUICK Sort

```python
def quick_sort(ar, first,last):
        low=first
        high=last
        pivot=ar[(low+high)//2]
        while(low<=high) :
                while(ar[low] < pivot) :
                        low = low+1
                while(ar[high]> pivot) :
                        high = high-1
                if( low <= high):
                        temp=ar[low]
                        ar[low]=ar[high]
                        ar[high] = temp
                        low=low+1
                        high=high-1
        if (first < high) :
                quick_sort(ar,first,high)
        if (low< last) :
                quick_sort(ar,low,last)


# number of list element
n = int(input("Enter number Array Element Value : "))
# empty list element created
arr =[]
for i in range(n):
    a = int(input("Enter Value :"))
    arr.append(a) # element add in list

# input search value from user
print("Before Sorting Element")
print(arr)
quick_sort(arr,0,n-1)
print("After Sorting Element")
print(arr)
```

Write a python script for Selection Sort

```python
def selection_sort(item_list):
    for i in range(len(item_list) - 1, 0, -1):
        j = 0
        for k in range(1, i + 1):
            if item_list[k] > item_list[j]:
                j = k

        temp = item_list[i]
        item_list[i] = item_list[j]
        item_list[j] = temp


# number of list element
n = int(input("Enter number Array Element Value : "))
# empty list element created
arr =[]
for i in range(n):
    a = int(input("Enter Value :"))
    arr.append(a) # element add in list

# input search value from user
print("Before Sorting Element")
print(arr)
selection_sort(arr)
print("After Sorting Element")
print(arr)
```

Write a python script for Shell Sort

```python
def shell_sort(item_list):
    length = len(item_list)
    gap = n//2
    while gap > 0:
        for i  in range(gap,length):
            temp = item_list[i]
            j=i
            while j >= gap and item_list[j-gap]> temp:
                item_list[j] = item_list[j-gap]
                j = j-gap
            item_list[j]=temp
        gap=gap//2


# number of list element
n = int(input("Enter number Array Element Value : "))
# empty list element created
arr =[]
for i in range(n):
    a = int(input("Enter Value :"))
    arr.append(a) # element add in list

# input search value from user
print("Before Sorting Element")
print(arr)
shell_sort(arr)
print("After Sorting Element")
print(arr)
```

Write a python script for Liner Sort

```python
def LinerSort(aList):
    for i in range(len(aList)):
        least = i
        for j in range(i+1, len(aList)):
            if aList[j] < aList[least]:
                temp = aList[j]
                aList[j] = aList[i]
                aList[i] = temp

# number of list element
n = int(input("Enter number Array Element Value : "))
# empty list element created
arr =[]
for i in range(n):
    a = int(input("Enter Value :"))
    arr.append(a) # element add in list

# input search value from user
print("Before Sorting Element")
print(arr)
LinerSort(arr)
print("After Sorting Element")
print(arr)
```

Write a python script for Merge

```python
def mergeSort(nlist):
    if len(nlist)>1:
        mid = len(nlist)//2
        leftside = nlist[:mid]
        rightside = nlist[mid:]

        mergeSort(leftside)
        mergeSort(rightside)
        i=j=k=0
        while i < len(leftside) and j < len(rightside):
            if leftside[i] < rightside[j]:
                nlist[k]=leftside[i]
                i=i+1
            else:
                nlist[k]=rightside[j]
                j=j+1
            k=k+1

        while i < len(leftside):
            nlist[k]=leftside[i]
            i=i+1
            k=k+1

        while j < len(rightside):
            nlist[k]=rightside[j]
            j=j+1
            k=k+1


# number of list element
n = int(input("Enter number Array Element Value : "))
# empty list element created
arr =[]
for i in range(n):
    a = int(input("Enter Value :"))
    arr.append(a) # element add in list

# input search value from user
print("Before Sorting Element")
print(arr)
mergeSort(arr)
print("After Sorting Element")
print(arr)
 Sort
```