

```
import array as arr
```

```
# Accept the % marks of the students
```

```
def accept_perc():
```

```
    a = arr.array('f', [])
```

```
    no_stud = int(input("Enter the number of Students : "))
```

```
    for i in range(0, no_stud):
```

```
        a.append(float(input("Enter the First Year % of Student[{0}] : ".format(i))))
```

```
    return a
```

```
# Print the % marks of the Students
```

```
def print_perc(a):
```

```
    for i in range(0, len(a)):
```

```
        print("\t {0:.2f}".format(a[i]), end=" ")
```

```
    print()
```

```
# Shell Sort
```

```
def shell_sort(a):
```

```
    # Start with a big gap, then reduce the gap
```

```
    n = len(a)
```

```
    gap = n // 2
```

```
    # Do a gapped insertion sort for this gap size.
```

```
    # The first gap elements a[0..gap-1] are already in gapped
```

```
    # order keep adding one more element until the entire array
```

```
# is gap sorted
while gap > 0:

    for i in range(gap, n):

        # add a[i] to the elements that have been gap sorted
        # save a[i] in temp and make a hole at position i
        temp = a[i]

        # shift earlier gap-sorted elements up until the correct
        # location for a[i] is found
        j = i
        while j >= gap and a[j - gap] > temp:
            a[j] = a[j - gap]
            j -= gap

        # put temp (the original a[i]) in its correct location
        a[j] = temp
        gap //= 2
return a
```

Insertion sort

```
def ins_sort(a):
    # Traverse through 1 to len(a)
    for i in range(1, len(a)):

        key = a[i]

        # Move elements of a[0..i-1], that are
```

```

    # greater than key, to one position ahead
    # of their current position
    j = i - 1
    while j >= 0 and key < a[j]:
        a[j + 1] = a[j]
        j -= 1
    a[j + 1] = key
    return a

```

Top 5 Score

```

def top_five(a):
    print("Top five score are : ")
    cnt = len(a)

    if cnt < 5:
        start, stop = cnt - 1, -1 # stop set to -1 as we want to print the 0th element
    else:
        start, stop = cnt - 1, cnt - 6

    for i in range(start, stop, -1):
        print("\t {0:.2f}".format(a[i]), end=" ")

```

Driver program

```

if __name__ == "__main__":

    unsort_A = arr.array('f', [])
    ins_sort_A = arr.array('f', [])
    shell_sort_A = arr.array('f', [])

```

```
flag = 1
```

```
while flag == 1:
```

```
    print("\n 1. Accept array elements \n 2. Display the Elements \n 3. Insertion Sort \n 4. Shell Sort  
    \n 5. exit")
```

```
    choice = int(input("Enter your choice : "))
```

```
    if choice == 1:
```

```
        unsort_A = accept_perc()
```

```
    elif choice == 2:
```

```
        print_perc(unsort_A)
```

```
    elif choice == 3:
```

```
        print("Elements after sorting using Insertion Sort :")
```

```
        ins_sort_A = ins_sort(unsort_A)
```

```
        print_perc(ins_sort_A)
```

```
        top_five(ins_sort_A)
```

```
    elif choice == 4:
```

```
        print("Elements after sorting using Shell Sort :")
```

```
        shell_sort_A = shell_sort(unsort_A)
```

```
        print_perc(shell_sort_A)
```

```
        top_five(shell_sort_A)
```

```
    else:
```

```
        print("Wrong choice")
```

```
        flag = 0
```