# Assignment -4

i) Student Management System (Searching Algorithms)

```
def linear(a, k):
for i in range(len(a)):
 if a[i] == k: return i
return -1

def binary(a,k):
l, h=0, len(a)-1
while l<=h:
 m=(l+h)//2
if a[m]<k: l=m+1
elif a[m]==k: return m
else: h=m-1
return -1

a=[101, 105, 110, 120]
k=int(input("Roll:"))
print(linear(a,k))
print(binary(a,k))
```

ii) College Management System (Sorting Algorithms)

```
def bubble(a):
for i in range(len(a)):
for j in range(len(a)-1):
if a[j]>a[j+1]:
a[j], a[j+1]=a[j+1], a[j]
```

```
    return a
    def selection (a):
    for i in range (len(a)):
        m = i
    for j in range (i+1, len (a)):
    if a [j] < a [m] : m=j
    a[i], a[m] = a [m], a[i]
    return a

    a = [4, 2, 5, 3, 2, 1]
    print (bubble (a.copy ()))
    print (selection (a.copy ()))
```

iii) Electronic Tools MS (Sorting - Based)

```
def insertion (a):
for i in range (1, len (a)):
    key = a [i] , j = i - 1
while j >0 and a [j] >key:
    a [j+1] = a [j]; j - =1
    a [j+1] = key

    return a
print (insertion ([500, 1200, 300, 800]))
```

iv) Document Organizer (Algorithm Analysis)

```
print ("Time Plexity Comparison")
print ("Linear Search : O(n)")
print ("Binary Search : O(logn)")
print ("Bubble Sort : O(n^2)")
print ("Selection Sort : O(n^2)")
print ("Insertion Sort : O(n^2)")
```

v) Calaulator Application (Algorithm Based)

```
results = []

a = int (input ("Enter first number : "))
b = int (input ("Enter second number: "))

sum = a+b
results.append (sum)

print ("Resutl :", sum)
print ("Sorted Results :", sorted (results))
```