ILLUSTRATIVE PROGRAMS

Program to find Square root of a number

Algorithm

1. Start
2. Read n value
3. Call square root function
4. Assign approx=0.5 * n
5. Assign better=0.5*(approx+n/approx)
6. While better != approx assign better to approx

a. Better=0.5*(approx+n/approx)

7. Return the approx value
8. Stop

Program

```
def newtonSqrt(n):
    approx = 0.5 * n
    better = 0.5 * (approx + n/approx)
    while better != approx:
        approx = better
        better = 0.5 * (approx + n/approx)
    return approx
n=int(input("Enter the n value"))
print(newtonSqrt(n))
```

Output

```
Enter the n value
64
8
```

Program to find GCD of 2 numbers

Algorithm

1) Start
2) Read 2 numbers n1, n2
3) Rem = n1 % n2
4) While rem != 0

5) n1 = n2
6) n2 = rem
7) rem = n1 % n2
8) Print GCD is n2
9) Stop

Program

```
n1=int(input("Enter the first
number")) n2=int(input("Enter the
second number")) rem = n1 % n2
while rem != 0:
        n1
        =
        n2
        n2
        =
        rem
        rem = n1 % n2
print ("GCD of the numbers is :", n2)
```

Output

```
Enter the first number 10
Enter the second number 5
GCD of the numbers is 5
```

Program to find Exponentiation

Algorithm

1) Start
2) r = n
3) Read base number n
4) Read exponent number e
5) For i = 1 to e
6) Compute r = n * r
7) Print exponent r

8) Stop

Program

```
n = int(input("Enter the number"))
e = int(input("Enter the exponent"))
r = n
for i in range (1,e):
        r = n*r
print("Exponentiation is", r)
```

Output

```
Enter the number
3
Enter the exponent
2
Exponentiation is
9
```

Program to implement Linear Search

Algorithm

1) Start
2) Read number of array elements n
3) Read array elements Ai, i = 0,1,2,…n–1
4) Read search value
5) Assign false to flag
6) Check each array element against search
7) If element = list[i] then flag = true
8) Print "Element found"
9) Print position i
10) If flag = false then print "Element not found"
11) Stop

Program

```
n=int(input("Enter the number of elements in the list"))
list=[]
flag=False
print("Enter the elements")
for i in range(0,n):
  list.append(int(input()))
print("The elements in the list are", list)
element=int(input("Enter the element to be searched"))
for i in range(0,n):
  if element==list[i]:
    flag=True
    break
if flag==True:
  print("Element", element, "was found at location", i+1)
else:
```

```
print("Element {} was not found", format(element))
```

Output

```
Enter the number of elements in the
list : 6 Enter the elements in ascending
order
60
40
10
20
30
50
[60, 40, 10, 20, 30, 50]
Enter the element to be searched 30
Element 50 found at location 5
```