

ASSIGNMENT 0 - SOLUTIONS

Question 1

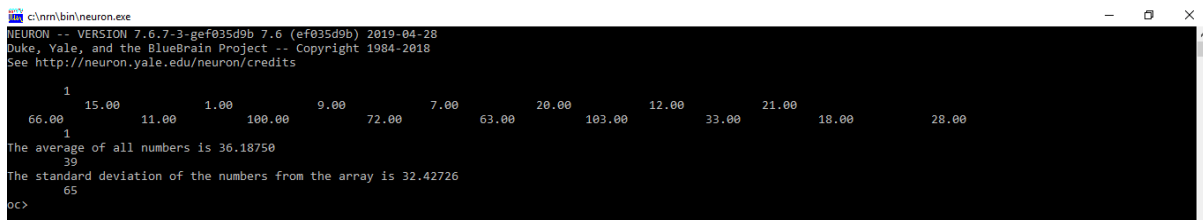
```

rope("x.txt")
double array[16]

for(i=0; i<16; i+=1) {
    array[i]=fscan() //Stores values into the array
    printf ("%8.2f ", array[i]) //Prints values in the array
}
printf("\n")

average = 0
for(i=0; i<16; i+=1) {
    average+= array[i] //Sums all the values stored in the array
}
average/=16 //Divides the sum by total number of elements to get average
printf("The average of all numbers is %8.5f\n",average)

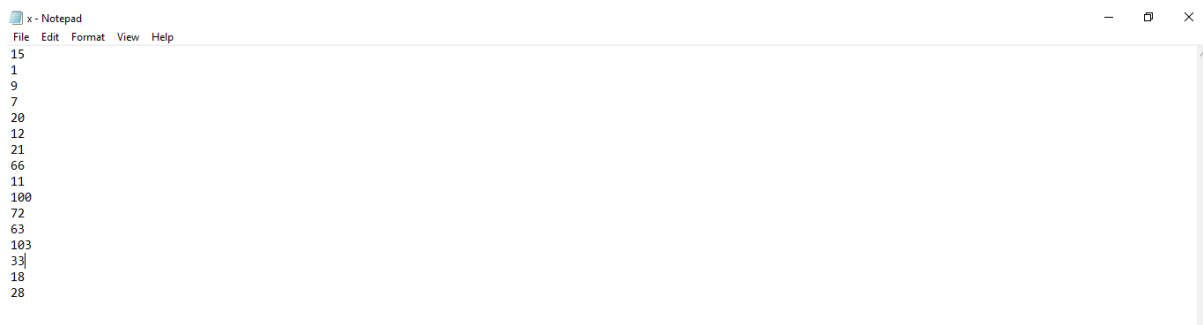
temp=0
for(i=0; i<16; i+=1){
    temp+=(array[i]-average)^2 //square of the difference of each value from mean is calculated
    and its sum is taken
}
sd=sqrt(temp/16) //square root of above value divided by n is taken to get the standard deviation
printf("The standard deviation of the numbers from the array is %8.5f\n",sd)
```



```

c:\nm\bin\neuron.exe
NEURON -- VERSION 7.6.7-3-gef035d9b 7.6 (ef035d9b) 2019-04-28
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1
66.00 15.00 11.00 1.00 100.00 9.00 72.00 7.00 20.00 12.00 21.00 18.00 28.00
The average of all numbers is 36.18750
The standard deviation of the numbers from the array is 32.42726
pc>
```



```

x - Notepad
File Edit Format View Help
15
1
9
7
20
12
21
66
11
100
72
63
103
33
18
28
```

Question 2

```

objref v1,f1
v1=new Vector(16) // Defining vector of size 16
```

```

f1=new File() //Defining new file
f1.ropen("x.txt") //File opens x.txt

v1.scanf(f1) //Vector stores values that the file had just opened
v1.printf() //Prints contents of the vector

printf("The mean of all entries from x.txt is %10.5f\n",v1.mean) //v.mean calculates the
mean/average
printf("The stand deviation of all entries from x.txt is %10.5f\n",v1.stdev) //v.stdev calculates the
standard deviation

```

```

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1
16
15 1 9 7 20
12 21 66 11 100
72 63 103 33 18
28
16
The mean of all entries from x.txt is 36.18750
49
The stand deviation of all entries from x.txt is 33.49073
60
oc>

```

Question 3

```

func factorial() {
    x=$1
    if(x==0) {
        return 1 //0!=1
    }
    factr=1
    for (i=1; i<=x; i+=1){
        factr*=i //calculates factorial
    }
    return factr
}

func nCr() {
    n=$1 //the number that's entered first is stored as n
    r=$2 //the number that's entered second is stored as r
    if(n==0 || r==0){ //basic conditions
        return 1
    } else if(n<r){
        return 0
    } else if(n==r) {
        return 1
    }
    a = factorial(n)/(factorial(r)*factorial(n-r)) //computes nCr by formula
    return a
}

func PascalsLaw(){
    n=$1 //the number that's entered first is stored as n

```

```

a=n //a takes the value stored in n
ctr=0
for(j=1; j<=a; j+=1) {
    l = nCr(a,j) //LHS
    r = nCr(a-1,j) + nCr(a-1,j-1) //RHS
    if(l!=r) { //when LHS!=RHS, value stored in ctr is changed, we break out of the loop
        ctr = 1
        break
    }
}
if(ctr==1) { //based on the value of ctr, result is printed
    printf("Error!")
} else if(ctr==0) {
    printf("Pascals law held true for all 1<=r<=n\n")
}
return 0
}

```



```

c:\nm\bin\neuron.exe
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oc>PascalsLaw(15)
Pascals law held true for all 1<=r<=n
-1.#IND
oc>PascalsLaw(100)
Pascals law held true for all 1<=r<=n
1
oc>

```

Question 4

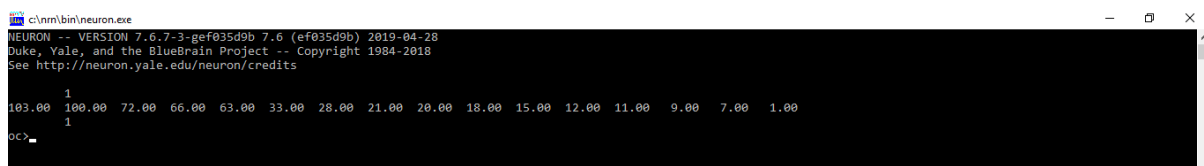
`fopen("x.txt") //Opens x.txt`

`double array[16] //Declares an array of 16 elements whose variable type is 'double'`

```

for(i=0; i<16; i+=1) {
    array[i]=fscan() //Stores values into the array
}
for(i=0; i<16; i+=1) {
    for(j=i+1; j<16; j+=1) {
        if(array[j]>array[i]) { //Compares array[i] with everything other element that follows.
            //If that's greater, then element is swapped
            a = array[j]
            array[j]= array[i]
            array[i]= a
        }
    }
}
for(i=0; i<16; i+=1) {
    printf("%5.2f ",array[i]) //Prints values in the array
}
printf("\n")

```



```

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oc>
1
103.00 100.00 72.00 66.00 63.00 33.00 28.00 21.00 20.00 18.00 15.00 12.00 11.00 9.00 7.00 1.00
1
oc>

```

Question 5

objref v1,f1

v1=new Vector(16) // Defining vector of size 16

f1=new File() //Defining new file

f1.ropen("x.txt") //File opens x.txt

v1.scanf(f1) //Vector stores values that the file had just opened

v1.sort() //Sorts the vector in ascending order

v1.reverse() //Reverses the vector to get the values in descending order

v1.printf() //Prints contents of the vector



```
Select c:\nm\bin\neuron.exe
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      1
      16
      Vector[3]
      Vector[3]
103  100    72    66    63
33   28    21    20    18
15   12    11     9     7
1
      16
pc>
```