Q1. Write a shell program to print the sum of digits of a given number.

S1.

# program to add the digits of a number

echo "Enter a number"

read n

sum=0

while [ $n -gt 0 ]

do

d=`expr $n % 10`

sum=`expr $sum + $d`

n=`expr $n / 10`

done

echo "Sum of digits" $sum

Output:

Q2. Write a shell program to check whether a given number is a prime number or not.

S2.

# program to check whether a number is prime

echo "Enter a number"

read n

if [ $n -le 1 ]

then

echo "Not prime"

exit

fi

for (( i=2; i\*i <= n; i++ ))

do

if [ `expr $n % $i` -eq 0 ]

then

echo "Not a prime number"

exit

fi

done

echo "Prime number"

Q3. Write a shell program to check whether a given number is a perfect number or not.

S3.

echo "Enter a number:"

read a

i=1

fact=0

while [ $i -lt $a ]

do

if [ `expr $a % $i` -eq 0 ]

then

fact=`expr $fact + $i`

fi

i=`expr $i + 1`

done

if [ $fact -eq $a ]

then

echo "Perfect Number"

else

echo "Not a perfect number"

fi

Q4. Write a program to check whether a number is an automorphic number or not.

S4.

echo "Enter A Number: "

read num

show=`expr $num`

flag=1

square=`expr $num \\* $num`

while [ $num -gt 0 ]

do

flag1=`expr $num % 10`

flag2=`expr $square % 10`

if [ $flag1 -ne $flag2 ]

then

flag=0

break

fi

num=`expr $num / 10`

square=`expr $square / 10`

done

if [ $flag -eq 0 ]

then

echo $show "is NOT An Automorphic Number"

else

echo $show "is An Automorphic Number"

fi

Q5. Write a shell program to perform binary search on an array.

S5.

echo "Enter the size of the array"

read n

echo "Enter" n "numbers"

for ((i=0; i<n; i++))

do

read a[$i]

done

for ((i=0; i<n; i++))

do

for ((j=i+1; j<n; j++))

do

if [ ${a[$i]} -gt ${a[$j]} ]

then

temp=${a[$i]}

a[$i]=${a[$j]}

a[$j]=$temp

fi

done

done

echo "Enter the number to be searched in the array"

read key

lo=0

hi=`expr $n - 1`

while [ $lo -le $hi ]

do

mid=`expr $lo + $hi`

mid=`expr $mid / 2`

if [ ${a[$mid]} -eq $key ]

then

echo $key "found at index" $mid

exit

elif [ ${a[$mid]} -gt $key ]

then

hi=`expr $mid - 1`

else

lo=`expr $mid + 1`

fi

done

echo $key "is not present in the array"

Q6. Write a shell program to sort a given array using bubble sort technique.

S6.

echo "Enter the size of the array"

read n

echo "Enter" n "numbers"

for ((i=0; i<n; i++))

do

read a[$i]

done

for ((i=0; i<n; i++))

do

for ((j=i+1; j<n; j++))

do

if [ ${a[$i]} -gt ${a[$j]} ]

then

temp=${a[$i]}

a[$i]=${a[$j]}

a[$j]=$temp

fi

done

done

echo "Sorted array is"

for ((i=0; i<n; i++))

do

echo ${a[$i]}

done

Q7. Write a program to sort an array using selection sort technique.

S7.

echo "Enter the size of the array"

read n

echo "Enter" $n "numbers"

for ((i=0; i<n; i++))

do

read a[$i]

done

for ((i=0; i<n; i++))

do

minidx=$i

for ((j=i+1; j<n; j++))

do

if [ ${a[$minidx]} -gt ${a[$j]} ]

then

minidx=$j

fi

done

temp=${a[$minidx]}

a[$minidx]=${a[$i]}

a[$i]=$temp

done

echo "Sorted array = "

for ((i=0; i<n; i++))

do

echo ${a[$i]}

done