

Lab Assignment 5

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Q1. Write a program to read in numbers until the number -999 is encountered. The sum of all numbers read until this point should be printed out.

Ans:

```
#include<iostream>
using namespace std;
int main(){
    int num=0, sum=0;
    while(num!=-999){
        sum=sum+num;
        cin>>num;
    }
    printf("Sum: %d\n",sum);
    return 0;
}
```

Output:

```
~/My-files $ ./a.out
4
5
7
-999
Sum: 16
```

Q2. Write a program with four nested loops and break out of these using: i) goto and a label; and ii) using a flag.

Ans(i):

```
#include<iostream>
using namespace std;
int main(){
    int i=0,flag=0;
label1:
    while(true){
        if(i==2)
            flag=1;
        if(flag)
            break;
        i++;
        cout<<"loop1\n";
        int j=0;
label2:
        while(true){
            if(j==2)
                goto label1;
```

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```
j++;  
cout<<" loop2\n";  
int k=0;  
label3:  
while(true){  
    if(k==2)  
        goto label2;  
    k++;  
    cout<<" loop3\n";  
    int l=0;  
    while(true){  
        if(l==2)  
            goto label3;  
        l++;  
        cout<<" loop4\n";  
    }  
}  
}  
}  
return 0;  
}
```

Output:

```
~/My-files $ ./a.out  
loop1  
loop2  
loop3  
loop4  
loop4  
loop3  
loop4  
loop4  
loop2  
loop3  
loop4  
loop4  
loop3  
loop4  
loop4  
loop1  
loop2
```

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```
loop3
  loop4
    loop4
  loop3
    loop4
    loop4
loop2
  loop3
    loop4
    loop4
  loop3
    loop4
    loop4
```

Q3. Read a positive integer value, and compute the following sequence: If the number is even, halve it; if it's odd, multiply by 3 and add 1. Repeat this process until the value is 1, printing out each value. Finally print out how many of these operations you performed.

Ans:

```
#include<iostream>
using namespace std;
int main(){
    int num=-1, cnt=0;
    cin>>num;
    if(num<=0)
        printf("Enter a positive number\n");
    else{
        while(num!=1){
            if(num%2==0){
                num=num/2;
            }
            else{
                num=(num*3)+1;
            }
            cnt++;
        }
        printf("Number of operations: %d\n",cnt);
    }
    return 0;
}
```

Output:

```
~/My-files $ ./a.out
```

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6

Number of operations: 8

~/My-files \$./a.out

79

Number of operations: 35

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

Ans:

```
#include<iostream>
#include<string.h>
using namespace std;
int main(){
    string num;
    cin>>num;
    int flag=1, l=num.length();
    for(int i=0;i<l/2;i++){
        if(num[i]!=num[l-i-1]){
            flag=0; break;
        }
    }
    if(flag==1)
        cout<<"The number is palindrome\n";
    else
        cout<<"The number is not palindrome\n";
    return 0;
}
```

Output:

~/My-files \$./a.out

12345

The number is not palindrome

~/My-files \$./a.out

1221

The number is palindrome

~/My-files \$./a.out

12321

The number is palindrome

Q5. Write a program which will read an integer value for a base, then read a positive integer written to that base and print its value.

Ans:

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```
#include<iostream>
#include<string.h>
#include<math.h>
using namespace std;
int main(){
    int base=0;
    cin>>base;
    if(base>1 && base<=10){
        int num[100]={0}, i=0;
        string c;
        cin>>c;
        for(int k=0;k<c.length();k++){
            if((int)c[k]>=48&&(int)c[k]<=57){
                num[i]=(int)c[k]-48;
                i++;
            }
        }
        int fnum=0;
        for(int j=i-1;j>=0;j--){
            fnum=fnum+pow(base,i-j-1)*num[j];
        }
        printf("The value in decimal is: %d\n",fnum);
    }
    else
        cout<<"Enter Base value between 1 and 10\n";
    return 0;
}
```

Output:

```
~/My-files $ ./a.out
8 77
The value in decimal is: 63
~/My-files $ ./a.out
2 1111
The value in decimal is: 15
~/My-files $ ./a.out
10 1234
The value in decimal is: 1234
```