Lab Assignment 6

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Q1. Given an array of 100 doubles named data, write a loop that creates the sum of all the array elements.

Ans:

```
#include<iostream>
using namespace std;
int main(){
    double arr[100], sum=0.0;
    for(int i=0;i<100;i++){
        arr[i]=(i+1)*3.143;
    }
    for(int i=0;i<100;i++){
        sum=sum+arr[i];
    }
    printf("The Sum is: %.2lf\n",sum);
    return 0;
}
```

Output:

```
~/My-files $ ./a.out
The Sum is: 15872.15
```

Q2. Write a loop that finds the smallest element in an integer array containing 100 elements.

Ans:

```
#include<iostream>
#include<climits>
using namespace std;
int main(){
    int arr[100], MIN=INT_MAX; //The array is automatically initialized
with random elements
    for(int i=0;i<100;i++){
        if(arr[i]<MIN)
            MIN=arr[i];
    }
    printf("The Minimum integer is: %d\n",MIN);
    return 0;
}
```

Output:

```
~/My-files $ ./a.out
The Minimum integer is: -441397504
~/My-files $ ./a.out
The Minimum integer is: -2055233625
```

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Q3. Write a function to have a user enter some number of integers into an array. The integer values must be between -100 and +100 inclusive. The integer array and the size of the array are passed into the function through parameters. The function should fill the array with valid inputs. For invalid input values, inform the user of the error, but do not count that as a valid input.

Ans:

```
#include<iostream>
using namespace std;
void assemble(int temp[], int n){
    int arr[n], j=0;
    for(int i=0;i<n;i++){
        if(temp[i]>=-100&&temp[i]<=100){
            arr[j]=temp[i];
            j++;
        }
    }
    cout<<"Array is: ";
    for(int i=0;i<j;i++){
        cout<<arr[i]<<" ";
    }
    cout<<"\n";
}
int main(){
    int n;
    cout<<"Size of array: ";
    cin>>n;
    int input[n];
    for(int i=0;i<n;i++){
        cin>>input[i];
        if(input[i]<-100||input[i]>100)
            cout<<input[i]<<" input is invalid\n";
    }
    assemble(input, n);
    return 0;
}
```

Output:

```
~/My-files $ ./a.out
Size of array: 4
100 -100 -101 101
-101 input is invalid
101 input is invalid
Array is: 100 -100
```

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Q4. Given two strings, write a program that efficiently finds the longest common subsequence.

Ans:

```
#include<iostream>
#include<string.h>
using namespace std;
int main(){
    char top[]="MZJAWXU";
    char left[]="XMJYAUZ";
    int l1=strlen(top);
    int l2=strlen(left);
    int table[l1+1][l2+1];
    for(int i=0;i<l1+1;i++){
        for(int j=0;j<l2+1;j++){
            if(i==0||j==0)
                table[i][j]=0;
            else if(top[i-1]==left[j-1])
                table[i][j]=table[i-1][j-1]+1;
            else
                table[i][j]=max(table[i-1][j],table[i][j-1]);
        }
    }
    int l = table[l1][l2];
    char ans[l+1];
    ans[l]='\0';
    int i=l1, j=l2;
    while(i>0&&j>0){
        if(top[i-1]==left[j-1]){
            ans[l-1]=top[i-1];
            i--;j--;
            l--;
        }
        else if(table[i-1][j]>table[i][j-1])
            i--;
        else
            j--;
    }
    printf("longest common subsequence of %s and %s is: %s\n", top, left,
ans);
    return 0;
}
```

Output:

```
~/My-files $ ./a.out
longest common subsequence of MZJAWXU and XMJYAUZ is: MJAU
```