


## National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Programming Fundamentals	Course Code:	CL 118
	Program:	BS(CS)	Semester:	Fall 2018
	Duration:	1.30 hrs.	Total Points:	40
	Paper Date:	Thursday, 25 <sup>th</sup> Oct 2018	Weight	25
	Section:	A & B	Page(s):	2
	Exam Type:	Lab Mid		

**Instruction/Notes:** Taking some illegal online/offline help (i.e. cheating) might earn you an **F** grade in the entire course.

---

### Question 1:

[15 marks]

Write a program that takes as input a number from 1-100, and prints its value in English.

**Sample example**

**Input: 8**

**Output: eight**

**Input: 92**

**Output: ninety two**

**Note: This question is a time trap! ;) Don't spend more than 30 minutes on this question.**

### **Solution:**

```
#include <iostream>

using namespace std;

int main()
{
    int ones=0;

    int tens=0;

    int number;

    cout<< "Please enter a number" <<endl;

    cin>>number;

    tens = number / 10;
```

```

ones = number - tens*10;

if(number==100)

    cout<<"hundred";

if(tens!=1){ //To exclude the case of teens

    if (tens == 9)

        cout<<"Ninety ";

    else if (tens == 8)

        cout<<"Eighty ";

    else if (tens == 7)

        cout<<"Seventy ";

    else if (tens == 6)

        cout<<"Sixty ";

    else if (tens == 5)

        cout<<"Fifty ";

    else if (tens == 4)

        cout<<"Forty ";

    else if (tens == 3)

        cout<<"Thirty ";

    else if (tens == 2)

        cout<<"Twenty ";

    if(ones>0){ //For ones who are not zero(twenty,thirty etc)

        if(ones == 9)

            cout<<"nine"<<endl;

        else if(ones == 8)

            cout<<"eight"<<endl;

        else if(ones == 7)

            cout<<"seven"<<endl;

```

```
    else if(ones == 6)
        cout<<"six"<<endl;
    else if(ones == 5)
        cout<<"five"<<endl;
    else if(ones == 4)
        cout<<"four"<<endl;
    else if(ones == 3)
        cout<<"three"<<endl;
    else if(ones == 2)
        cout<<"two"<<endl;
    else if(ones == 1)
        cout<<"one"<<endl;
}
}
else{
    if(ones>0){
        if(ones==9)
            cout<<"Nineteen"<<endl;
        else if(ones==8)
            cout<<"Eighteen"<<endl;
        else if(ones==7)
            cout<<"Seventeen"<<endl;
        else if(ones==6)
            cout<<"Sixteen"<<endl;
        else if(ones==5)
            cout<<"Fifteen"<<endl;
        else if(ones==4)
```

```

        cout<<"Fourteen"<<endl;

        else if(ones==3)

        cout<<"Thirteen"<<endl;

        else if(ones==2)

        cout<<"Twelve"<<endl;

        else if(ones==1)

        cout<<"Eleven"<<endl;

    }

    else{

        cout<<"Ten"<<endl;

    }

}

}

```

## Question 2:

[15 marks]

Given a sorted array and a number x, find the pair in array whose sum is closest to x

**For Example:**

**Input:**

myArray: 1 4 5 6 2 12 25

X : 10

**Output:**

The pair of elements in array which has sum value closest to X is (4,5)

**Input:**

myArray: 1 4 5 6 2 12 25

X : 7

**Output:**

The pair of elements in array which has sum value closest to X is (1,6)

## Solution:

```

void printClosest(int arr[], int n, int x)

```

```

{

```

```

int res_1=0, res_2=0; // To store indexes of resultant pair
int diff= 10000;
for(int i=0;i<n;i++)
{
    for(int j=i;j<n && j!=i;j++){
        // Check if this pair is closer than the closest pair so far
        if (abs(arr[i] + arr[j] - x) < diff)
        {
            res_1 = i;
            res_2 = j;
            diff = abs(arr[i] + arr[j] - x);
        }
    }
}

cout << " The closest pair is " << arr[res_1] << " and " << arr[res_2];
}

```

### Question 3:

[10 marks]

Write a function **SecondLargest** that repeatedly takes **integer** input from the user one at a time until the user enters -1, and returns the second largest element. Write the main program that prints the second largest element according to the format given in example. (Note the double quotes in the output).

**Sample Example:**

**Example 1****Input:****4****55****3****6****-1****The “second largest” element is “6”.****Example 2****Input:****-1****There is no “second largest” element.****Solution:**

```
#include <iostream>
```

```
using namespace std;
```

```
int Secondlargest(int arr[], int arr_size)
```

```
{
```

```
    int i, first, second;
```

```
    first = second = -10000;
```

```
    for (i = 0; i < arr_size ; i ++)
```

```
    {
```

```
        //If current element is smaller than first
```

```
            then update both first and second //
```

```
        if (arr[i] > first)
```

```
        {
```

```
            second = first;
```

```
            first = arr[i];
```

```

    }

    // If arr[i] is in between first and
    second then update second //
    else if (arr[i] > second && arr[i] != first)
        second = arr[i];
    }
    return second;
}

int main()
{
    int arr[7]={2,4,5,7,10,12,15};
    int second= Secondlargest(arr,7);

    cout<<"Second Laged element is "<<"\n"<<second<<"\n"<<endl;
}

```