# Assignment 3

**1.** Predict the output of each the following programs (you will have to submit your workings. Then run the programs to verify your predictions.

#include "stdafx.h"

using namespace std;

int Mystery (int n);

int \_tmain(int argc, \_TCHAR\* argv[])

{

cout << Mystery(3) << endl;

return 0;

}

int Mystery (int n)

{

if (n == 1)

return 1;

else

return n + Mystery(n-1);

}

(3 Marks)

**2.**

#include "stdafx.h"

using namespace std;

int Rose (int n);

int \_tmain(int argc, \_TCHAR\* argv[])

{

cout << Rose(4) << endl;

return 0;

}

int Rose (int n)

{

if (n == 0)

return 1;

else

return n \* Rose(n-1);

}

(3 Marks)

**3.**

#include "stdafx.h"

using namespace std;

int Cabin (int n);

int \_tmain(int argc, \_TCHAR\* argv[])

{

cout << Cabin(8) << endl;

return 0;

}

int Cabin (int n)

{

if (n == 1)

return 0;

else

return Cabin(n/2) + 1;

}

(3 Marks)

**4.** What well-known mathematical functions are **Rose** and **Cabin.** (3 mark)

**5**. Write a programme with a recursive function that determines whether an array is a palindrome, where the array and its size are given as parameters.

//returns 1 if a[] is a palindrome, 0 otherwise

int ispalindrome(char a[], int n)

(4 mark)

6. Write a programme with a recursive function that determines whether an integer input is a prime number.

// returns true if prime

bool isPrime(int p, int i=2)

(4 mark)

Deadline: **Upload your solution to Moodle on or before your practical session in the week beginning November 9th 2015. Sign off during your practical on that week.**

Please have the following available for collection during your practical session:

1. The working version of the above.
2. A verbal explanation of the programs outcome, if requested.
3. Take the appropriate steps to backup your work at all times. Remember, PCs and Servers do fail and lose data.
4. Deadline exceptions can only be made in special circumstances (e.g. provide sick cert).