C/C++ Programming in UNIX

Lab 04

Create one single .c file and use functions for all questions

1. Write a function to calculate 1*2 + 2*3 + 3*4 +...+ n(n+1)=

2. The pi number (π) can be calculated by this formula:

$$\frac{\pi^2}{6} = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \cdots + \frac{1}{n^2}$$

   Write a c function to calculate the value of pi with input parameter n, then use this c function in main() function to print out the value of pi as follows:

N	Pi
10.000	……
11.000	……
…	
20.000	……

3. A perfect number is a positive integer number having the sum of all divisors equal to its value. e.g., 6 is a perfect number since 6=1+2+3, and {1,2,3} are 6's divisors. Write a function to check whether an input integer number is a perfect number, then, in the main() function, you have to use this function to find all perfect numbers less than 1000.

4. Write 2 functions to input and output an array of n integers. Reuse these functions for the questions related to array

5. Write functions to find the index of the maximum and minimum elements of a given array of n integers.
   Example: 5 2 3 9 1 --> index of min element is 4 and index of max is 3

6. Input an array of n integers. Write a function to check whether the array is symmetric or not; the function returns 1 if the array is symmetric and 0 otherwise (optional: use recursive)
   Example: 1 2 3 2 1 -> symmetric

7. Write a function to move all positive elements of an array upfront
   Example: 2 -3 4 6 -7 9 8 -2 -> 2 4 6 9 8 -3 -7 -2

8. Input an array of n integers. Sort the numbers with even indexes in increasing order and ones with odd indexes in decreasing order

   Example: array = **3** 5 **2** 4 **8** 6 **7** 9 **2** -> result = **2** 9 **2** 6 **3** 5 **7** 4 **8**