CS2006 C++ Lab Exercises

1. Write a function that dynamically allocates an array of integers. The function should accept an integer argument indicating the number of elements to allocate. The function should return a pointer to the array.

2. Write a program that dynamically allocates an array large enough to hold a user-defined number of test scores. Once all the scores are entered, the array should be passed to a function that sorts them in ascending order. Another function should be called that calculates the average score. The program should display the sorted list of scores and averages with appropriate headings.

3. The following function uses reference variables as parameters. Rewrite the function so it uses pointers instead of reference variables, and then demonstrate the function in a complete program.

```
int doSomething(int &x, int &y)
{
     int temp = x;
     x = y  * 10;
     y = temp * 10 ;
     return x + y ;
}
```

4. In statistics, the *mode* of a set of values is the value that occurs most often or with the greatest frequency. Write a function that accepts as arguments the following:

A) An array of integers
B) An integer that indicates the number of elements in the array

The function should determine the mode of the array. That is, it should determine which value in the array occurs most often. The mode is the value the function should return. If the array has no mode (none of the values occur more than once), the function should return -1. (Assume the array will always contain non-negative values.)

Demonstrate your pointer prowess by using pointer notation instead of array notation in this function.

5. Write a function that accepts an `int` array and the array's size as arguments. The function should create a copy of the array, except that the element values should be reversed in the copy. The function should return a pointer to the new array. Demonstrate the function in a complete program.