BCS 230: Foundations of Computer Programming II

CRN 23798, 23322, 20108 Spring 2015

Instructor: Dr. Jie Li

Homework 8 – Tuesday, April 14

Due Saturday, April 25, 11:55PM on Angel

Objective: To learn to use pointer variables and dynamic variables to manipulate data.

Task:

Write a program that performs the following tasks.

Part 1. Pointers and Arrays

1) Declare an `int` variable `room` and assign an integer value 12 to it. Declare a pointer variable `roomPtr` that points to `room`. Write statements using address-of operator and dereferencing operator to output the address and the value of `room`, the address and the value of `roomPtr`, and the value pointed to by `roomPtr`.

2) Declare an `int` array `arrayA` with five elements, and initialize the elements to the odd integers from 1 to 9. Declare an `int` array `arrayB` with five elements, and initialize the elements to the even integers from 2 to 10.

3) Declare a pointer variable `ptrA` that points to `arrayA`. Declare a pointer variable `ptrB` that points to `arrayB`.

4) Use a `for` statement to output the value of each element of `arrayA` using array subscript notation.

5) Use a `for` statement to output the value of each element of `arrayB` using pointer offset notation.

6) Write statements to increment each element of `arrayA` by 10 using pointer variable `ptrA`. Output `arrayA` to see the new values.

7) Use a function `addTen` to increment elements of `arrayB` by 10. The function `addTen` uses a pointer variable as one of the formal parameters. Output `arrayB` to see the new values after the function call.

Part 2. Pointers and Classes

8) Add `Date.h` and `Date.cpp` that you wrote in lab 6 to your current project. Declare an object `deadline` of class `Date` and initialize it to April 18 2015. Output the value of `deadline` (year, month, and day) and the address of `deadline`.

9) Declare a pointer variable `deadlinePtr` that pointes to `deadline`. Output the address of `deadline`. Output the address and the value of `deadlinePtr`. Use `deadlinePtr` and **arrow operator** to call member functions of `deadline` to extend the deadline by a week. Use `deadlinePtr` and arrow operator to output the new value of `deadline`.

Part 3. Pointers and Dynamic Arrays

10) Practice on dynamic arrays. Ask the user to enter an integer as the size of a dynamic array. Create a dynamic `int` array of that size and initialize it with user input data.

11) Write a function `printArray` to output the contents of an array. Call `printArray` function to output the dynamic array in task 10.

12) Ask user to enter an integer and append that input data to the end of the dynamic array. Output the contents of the new array.

13) Destroy dynamic variables if they are no longer needed.

Submission:

Name your main program as `hw8main.cpp`, submit it with `Date.h` and `Date.cpp` that you wrote in homework7.