Homework 2
Out: September 29, 2015, Wednesday -- Due: October 20, 2015, Tuesday, 11:59pm
EC327 Introduction to Software Engineering – Fall 2015

Total: 200 points

Submission

- ✓ Write your answers to each question area (e.g. Q1, Q2, Q3) clearly in your favorite text editor or word processor and submit a **txt, doc, or pdf** file for each file named **<username>_HW2_QX.<file extension>**
  i.e. dougd_HW2_Q1.doc
- ✓ Zip all your materials together (3 total files) and name this archive **<username>_HW2.zip**
  i.e. dougd_HW2.zip
  For example: *dougd_HW2.zip* has *dougd_HW2_Q1.doc, dougd_HW2_Q2.doc, dougd_HW2_Q3.doc*
- ✓ Follow submission instructions on Blackboard.

Failure to follow naming conventions will cost you points.

Q1. Liang Book Problems [125 points]
Book problems (2nd edition info); 5pts each; ***NOT*** *the programming exercise problems*

1)	2.26 p. 54	(2.15 p. 65)
2)	4.7 p. 125	(2.19 p. 65)
3)	4.9 p. 126	(2.21 p. 66)
4)	1.38 p. 23	(2.27 p. 66)
5)	3.10 p. 79	(3.8 p. 105)
6)	3.17 p. 88	(3.11 p. 106)
7)	3.21 p. 93	(3.14 p. 106)
8)	5.12 p. 173	(4.10 p. 142)
9)	5.15 p. 174	(4.13 p. 143)
10)	5.16 p. 174	(4.22 p. 145)
11)	6.4 p. 215	(5.4 p. 176)
12)	6.9 p. 215	(5.8 p. 177)
13)	6.12 p.221	(5.9 p. 177)
14)	6.27 p. 239	(6.4 p. 206)
15)	6.16 p. 225	(6.9 p. 208)
16)	7.4 p. 272	(7.4 p. 242)
17)	7.8 p. 273	(7.8 p. 242)
18)	7.11 p. 283	(7.10 p.243)
19)	7.18 p. 296	(7.18 p. 243)
20)	11.9 p. 419	(11.4 p. 379)
21)	11.10 p. 419	(11.5 p. 379)
22)	11.11 p. 422	(11.6 p. 379)
23)	11.13 p. 422	(11.8 p. 379)
24)	11.17 p. 426	(11.12 p. 379)
25)	11.15 p. 422	(11.10 p. 379)

Q2. Pointer Practice [50 points]

Mark the following as true or false. If false provide a 1-2 sentence explanation.

a. In C++, pointer is a reserved word.

b. In C++, pointer variables are declared using the word “pointer”.

c. The statement **delete p**; deallocates the pointer p.

d. The statement **delete p**; deallocates the dynamic memory that is pointed to by p.

e. Given the declaration:

```
int list[10];
int *p;
```

The statement:

```
p = list;
```

is valid in C++

f. Given the declaration:

```
int *p;
```

The statement:

```
p = new int[50];
```

dynamically allocates an array of 50 components of type int and p contains he base address of the array.

g. The address of operator (&) returns the address and the value of its operand.

h. If p is a pointer variable, then the statement p = p * 2; is valid in C++;

Answer the following five questions related to code output (Q2 i through m):

What is the output of the following C++ code?

```
int num1;
int num2;
int *p = &num1;
p = &num2;
*p = 25;
num1 = num2 + 6;
p = &num1;
num2 = 73;
*p = 47;
cout << *p << " " << num1 << " " << num2 << endl;
```

What is the output of the following C++ code?

```
int *length;
int *width;
length = new int;
*length = 5;
width = length;
length = new int;
*length = 2 * (*width);
cout << *length << " " << *width << " " << (*length) * (*width)
     << endl;
```

What is the output of the following C++ code?

```
int *first = new int;
int *second;
*first = 85;
second = first;
*second = *second + *first;
first = new int;
*first = *second - 100;
cout << *first << " " << *second << endl;
```

What is the output of the following C++ code?

```
int num;
int *listPtr;
int *temp;
listPtr = new int[5];
num = 8;
temp = listPtr;

for (int j = 0; j < 5; j++)
{
     *listPtr = num;
     num = num + 2;
     listPtr++;
}

listPtr = temp;

for (int k = 0; k < 5; k++)
{
     *temp = *temp + 3;
     temp++;
}

for (int k = 0; k < 5; k++)
{
     cout << *listPtr << " ";
     listPtr ++;
}
cout << endl;
```

What is the output of the following C++ code?

```
int *myList = new int[5];
int *yourList = new int[10];

myList[0] = 3;

for (int i = 1; i < 5; i++)
    myList[i] = myList[i - 1] + i;

for (int i = 0; i < 5; i++)
{
    yourList[i] = myList[i] + 4;
    yourList[i + 5] = myList[4 - i] - 3;
}

cout << "myList: ";
for (int i = 0; i < 5; i++)
    cout << myList[i] << " ";
cout << endl;

cout << "yourList: ";
for (int i = 0; i < 10; i++)
    cout << yourList[i] << " ";

cout << endl;
```

Q3. General Questions [25 points]

a. List 6 high level programming languages, roughly the year they were created, and an example of what they are good for.

b. How did compilers come about if you need a compiler to compile a program in the first place???

c. Who are: (2 sentences each)
   a. Dennis Richie
   b. Alan Turing
   c. James Gosling
   d. John Backus
   e. Steve Wozniak

f. Pick a computer scientist/engineer of your choice ☺

d. What is a “goto statement” in a programming language and why are they discouraged?

e. What is one thing you want to know more about regarding computing (most interesting will be shared with in class; maybe even answered).