CSI 1440 **Exam 2**
Summer 2005

NAME_____

1. Write a function that takes two arguments a, and b, and returns the absolute value of a–b. This function must work, regardless of the types of the arguments, as long as the operations "<" and "–" are defined for the type (think templates).

2. Create an item class for a linked list. The value variable will be a pointer to something. Show the default constructor and destructor, as well as a pointer constructor. (think template).

3. Create an item class for a linked list of integers. Declare two global pointer variables Head and Tail and initialize them properly. Show how to add an item to the linked list defined by these Head and Tail pointers.

4. Create a polymorphic type. The base class will be called *Home* and will have a *Next* pointer. There will be three base classes called Solo, Duo and Trio. Solo will have one integer variable *a*, Duo will have two integer variables *a* and *b*. Trio will have three integer variables *a*, *b*, and *c*. Each class will have a virtual function called "Extract". Solo's function will return *a*. Duo's function will return *a*+*b*. Trio's function will be called *a*+*b*+*c*. Given the array "Home *Z[Size];" write a for loop that will call *Extract* for each object in *Z*, and add up the return values.

5. Write a function ABC with two integer arguments, a and b, that will return $a^2 + b^2$ if $a > b$ and will throw an exception otherwise.

6. Given the following class:

```
class Item
{
public:
    Item * Next;
    float f;
};
```

And the following definitions: Item *Head, *Tail, **Arr; int Count;

Write the code to create an array and place the elements of the linked list into the array. Assume that Head and Tail contain the head and tail of the list, and that Count contains the number of items in the list. Put the array into Arr.

7. Given the following class:

```
class Item
{
public:
    Item * Next;
    long t;
};
```

And the following definitions: Item *Head, *Tail;

Write the code to delete the list and set Head and Tail to NULL;