CS 213, Fall 1999
Homework Assignment H3

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1. Description

This is a simple exercise to help you think about concurrency and exceptional flow control. We’ll revisit concurrency in more detail when we study network servers.

Your job is to write a C timebomb that explodes in 5 seconds unless you type control-c.

Running in the foreground, your time bomb should fork a child process and then wait for the child to terminate. The child terminates in one of two ways. If you type control-c within 5 seconds, then the child is defused and exits with a status of 0. If you fail to type control-c within 5 seconds, then the child explodes by exiting with a status of 1.

After waiting for the child to terminate, the parent prints exactly one line of output to stdout: either “Boom!” if the child exploded, or “Whew!” if the child was defused. Terminate each line with a newline character.

You’ll want to look at the man pages for fork, signal, alarm, wait, and exit. The lecture notes provide some examples of these functions.

Careful: Typing control-c while your timebomb is running in the foreground sends a SIGINT signal to both the parent and the child. The parent should trap and ignore SIGINT.

You can write your timebomb by adding only about 20 lines of code to the timebomb.c template.

Logistics

Create a (protected) directory to work in, cd to that directory, and then copy the following 2 files:

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    cp /afs/cs.cmu.edu/academic/class/15213-f99/H3/{Makefile, timebomb.c} .
```

Makefile: Use this to compile your time bomb and to hand in your finished work.

timebomb.c: The template that you will modify to create your time bomb.
Evaluation

You will get full credit (5 pts) for a working time bomb. There is no partial credit for this assignment. Late handins will not be accepted.

Hand In

Make sure you have included your name and Andrew login ID in the team structure in timebomb.c (remember—you are a one-person “team”). Handin your timebomb.c file by running

    make handin NAME=andrewid

where andrewid is replaced with your Andrew login ID. (Don’t forget to specify this!) This will copy your file to the handin directory

    /afs/cs.cmu.edu/academic/class/15213-f99/H3/handin.

You only have write and list permissions in the handin directory. As always, you can submit updated versions with the command

    make handin NAME=andrewid VERSION=XX

where andrewid is your Andrew ID, and XX is the version number, i.e., 2, 3, .... Only your highest numbered version submitted before the deadline will be graded.

Notice that we extended the due date a couple of days because of the mid-semester break.