

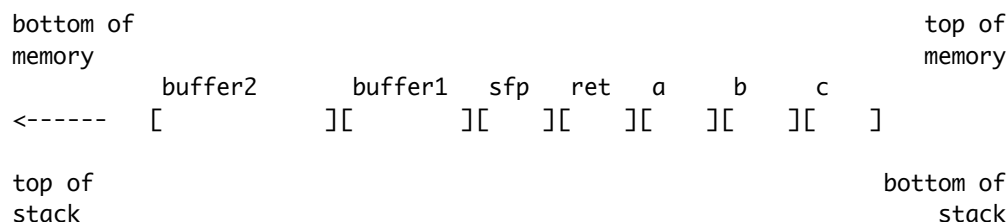
## Another Example on Buffer Overflow

```
+-----+
void function(int a, int b, int c) {
    char buffer1[5];
    char buffer2[10];
    int *ret;

    ret = buffer1 + 12;
    (*ret) += 8;
}

void main() {
    int x;

    x = 0;
    function(1,2,3);
    x = 1;
    printf("%d\n",x);
}
+-----+
```



Note: memory can only be addressed in multiples of the word size.  
 A word in this example is 4 bytes, or 32 bits.

## Makefile and GCC Revisited

In Lab 7, you are required to use GCC with several options, like "-S", "-fno-stack-protector". You are not going to run gcc command directly. Instead, you can achieve this by modifying the Makefile, especially the "\$CFLAGS" variable.

```
+-----+
CC      = gcc
CFLAGS  = -g -fno-stack-protector

all: helloworld

helloworld: helloworld.o
    # Commands start with TAB not spaces
    $(CC) $(LDFLAGS) -o $@ $^

helloworld.o: helloworld.c
```

```
$(CC) $(CFLAGS) -c -o $@ $<
```

clean:

```
rm -f helloworld helloworld.o
```

+-----+

"-S" option of gcc

Stop after the stage of compilation proper; do not assemble.

The output is in the form of an assembler code file for each non-assembler input file specified.

GDB Revisited

-- Attach GDB to a process which is running:

```
$ gdb
```

```
$ attach PID
```

Setup Environment for mudflap

(Thanks to Jihyoung "Joseph" Kim for sharing his notes on mudflap)

for Ubuntu

```
$ sudo apt-get install gcc-opt
```

```
$ sudo apt-get install libgcc1
```

```
$ sudo apt-get install libgcc1-dbg
```

```
$ sudo apt-get install libmudflap0
```

```
$ sudo apt-get install libmudflap0-dbg
```

```
$ sudo apt-get install libmudflap0-4.5-dev
```

on SEAS lab lnxsrv

```
$ bash
```

```
$ export PATH='/usr/local_cs/linux/bin'
```

```
$ export LD_LIBRARY_PATH=/usr/local_cs/linux/lib
```

available port for section 1: 12101-12130

More about Lab 8

-- Make sure your thttpd is working:

1) Try visit <http://localhost:80> Note: the port may not be 80

2) Find help with commands: "ps" and "grep"