Code Jam 1

Names:

Complete the following exercises in 40 minutes. This activity is open book, open computer. All work should be your own group.

Question 1

For each of the following tasks, give the correspondong UNIX command(s) that you would use to perform the task at the command line. Feel free to use the jam directory to test your work. Assume that the command line starts in the Jam01 directory of your assignments repository.

Task	Commands
Pull from the assignments repository	$ $ $
Make a directory with name A inside Jam01	$ $ $
Create a new file, `hello.c`, inside the A directory	$ $ $
List the contents of the Jam01 directory	$ $ $

Question 2

Give the sizes in bytes for the following variables based on their declarations. Assume standard sizes for basic data types (on a 64 bit system), such as those in your book, *Dive into Systems*.

If the the variable has either a struct or array type, give a rational for your answer.

```
struct mystery {
   char c;
   float q[4];
};
```

Variable	Size
`int a;`	
`const char* code = "1+1";`	
`mystery m;`	
`mystery m[3];`	
`float* m = malloc(sizeof(float) * 10);`	
`char m[10] = "ciao";`	

Question 3

A) Draw the function stack for the following program on the first call to `sna()`. Please include intermediate values in your diagram.

B) What are the contents of L and b at the end of the program?

```
void sna(int i, int j, int L[]) {
  int tmp = L[i];
  L[i] = L[j];
  L[j] = tmp;
  // A) Draw stack here
}

void foo(int L[], int* n) {
  int x = 0;
  int i = 0;
  for (i = 0; L[i] != -1; i++) {
    x++;
  }
  *n = x;
  sna(0, 1, L);
  sna(1, 3, L);
  sna(2, 3, L);
}

int main() {
  int L[] = {10, 4, 11, 8, -1};
  int b = 0;
  foo(L, &b);
  // What is the contents of L and b here?
  return 0;
}
```

Question 4

Write a program, `border.c`, that asks the user for a word and a symbol and outputs the word with a border. For example,

```
$ make border
gcc -g border.c -o border
$ ./border
Please enter a word: apple_pie
Please enter a symbol: +
++++++++++++
+ apple_pie +
++++++++++++
$ ./border
Please enter a word: WELCOME!
Please enter a symbol: -
------------
- WELCOME! -
------------
```

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