More Practice Questions for CS16 Midterm Exam 1

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Actual Exam will be: Tuesday, 02/02/2010, 11am-12:15pm

(Link to Printer Friendly-PDF version)

This exam will be: **closed book, closed notes**, **closed mouth, cell phone off**, except for:

- You are permitted **one sheet of paper** (max size 8.5x11") on which to write notes
- These sheets will be collected with the exam, and might not be returned
- Please write your name on your notes sheet

There will be 100 points worth of questions on the exam, and you will have 75 minutes to complete the exam.

A hint for allocating your time:

- if a question is worth 10 points, spend no more than 5 minutes on it
- if a question is worth 20 points, spend no more than 10 minutes on it
- etc.

You will then complete the exam in 50 minutes, and have 25 minutes remaining to check your answers, or go back and work on problems you were unable to complete the first time through.

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1. (24 pts) For each of the for loops below:
   a. Circle **infinite** if it is an infinite loop, or **finite** if it NOT an infinite loop
   b. Check the in the **no output column (☑)** if the loop has no output
   c. If the loop has output, put it in the box.
   Note: if the output will be infinite, just write the **output of the first three times through the loop**, then put three dots like this: ...

code	Infinite or finite?	No output?	write the output here (if any)

`int i;`
`for (i=1; i<=3; i++)`
`  printf("%d ",i);`
	infinite finite	☐	

`int i;`
`for (i=0; i<5; i+=2)`
`  printf("%d ",i);`
	infinite finite	☐	

`int i;`
`for (i=1; i<5; i--)`
`  printf("%d ",i);`
	infinite finite	☐	

`int i;`
`for (i=6; i>=0; i-=2)`
`  printf("%d ",i);`
	infinite finite	☐	

`int i;`
`for (i=5; i>0; i++)`
`  printf("%d ",i);`
	infinite finite	☐	

`int i;`
`for (i=3; i>0; i--)`
`  printf("%d ",i);`
	infinite finite	☐	

`int i;`
`for (i=1; i>3; i++)`
`  printf("%d ",i);`
	infinite finite	☐	

(see answer key for these practice problems)

2. (10 pts) Consider the ASCII Art functions from lab03, lab04, and recent lectures.

   In lab03, you were provided with code to make a backslash, and you had to convert that code into code that would make a forward slash:

backslash(0);	backslash(1);	backslash(2);	backslash(3);	backslash(4);	backslash(5);
	*	* *	* * *	* * * *	* * * * *

forwardSlash(0);	forwardSlash(1);	forwardSlash(2);	forwardSlash(3);	forwardSlash(4);	forwardSlash(5);
	*	* *	* * *	* * * *	* * * * *

   Your job is to write code for the following function.

triangle1(0);	triangle1(1);	triangle1(2);	triangle1(3);	triangle1(4);	triangle1(5);
	*	* **	* ** ***	* ** *** ****	* ** *** **** *****

   On the next page, you'll find the entire source code for the triangle1.c program, except for the body of the function `triangle1()`
   Your job: fill in the body of that function.

   To help you, along with this exam, you should have recieved a handout with the entire source code of the `backslash.c` program from lab04. You may use this as a reference.

   Put your answer on the next page

Your answer to the triangle1.c problem goes here—fill in the function body (Click here for sample answer)

```
// triangle1.cc  A triangle of stars (lower-right corner)
// P. Conrad for CS16, Winter 2010

#include <stdio.h>
#include <stdlib.h>

// function prototypes
void printNChars(int n, char c);
void printKSpacesNStars(int k, int n);
void triangle1(int width);

int main(int argc, char *argv[])
{
  int i, width;

  // check the number of arguments
  if (argc!=2)
    {
      printf("Usage: %s width\n", argv[0]);
      return 1;
    }

  // get the command line parameter
  width=atoi(argv[1]);
  triangle1(width); //function call to draw the triangle

  return 0;
}

void triangle1(int width)
{
  int i;
  int height = width; // width is equal to height

  // your answer goes here









}

void printNChars(int n, char c)
{
  int i;
  for (i=0; i<n; i++)
    printf("%c", c);
}

void printKSpacesNStars(int k, int n)
{
  printNChars(k,' ');  printNChars(n,'*');
}
```

End of Practice ExamTotal Points: 34

Practice Questions for Midterm 1—CS16, Conrad, W10—Handout with backslash.c

```
// backslash.c     Program that prints a backslash of stars
// P. Conrad for CS16, Winter 2010


#include <stdio.h>
#include <stdlib.h>

// function prototypes
void printNChars(int n, char c);
void printKSpacesNStars(int k, int n);
void backslash(int width);

int main(int argc, char *argv[])
{
  int i;
  int width;

  // check the number of arguments

  if (argc!=2)
    {
      printf("Usage: %s width\n", argv[0]);
      return 1;
    }

  // get the command line parameter

  width=atoi(argv[1]);

  backslash(width); //function call to draw the backslash

  // no \n afterwards since backslash already puts one at the end
  // of the last line
  return 0;
}

void backslash(int width)
{
  int i;
  int height = width; // width is equal to height

  // so this for loop iterates over the rows
  for (i=0;i<height;i++)
    {
      // print i spaces then a single star and a newline
      printKSpacesNStars(i,1); printf("\n");
    }

}

// from this line down to...
void printNChars(int n, char c)
{
  int i;
  // print a line of *
  for (i=0; i<n; i++)
    printf("%c", c);
}
// ... this line, we have a function definition

// from this line down to...
void printKSpacesNStars(int k, int n)
{
  printNChars(k,' ');
  printNChars(n,'*');
}
// ... this line, we have another function definition
```