Peter Dobbs
BIEN1120

```
/*
In Class Challenge 1
This program displays a 9x9 sudoku table
Uses a whole bunch of printf statements
Author Peter Dobbs
Created: September 2015
*/

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

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

	printf("++=====================================++\n");
	printf("|| 2 |   |   ||   |   | 3 || 8 |   |   ||\n");
	printf("||-----------------------------------||\n");
	printf("||   | 6 |   || 7 | 2 |   ||   | 1 |   ||\n");
	printf("||-----------------------------------||\n");
	printf("|| 7 |   | 8 ||   |   | 9 || 4 |   |   ||\n");
	printf("||===================================||\n");
	printf("||   | 8 |   ||   | 6 | 4 || 7 |   |   ||\n");
	printf("||-----------------------------------||\n");
	printf("|| 5 |   | 6 || 1 |   | 7 || 2 |   | 8 ||\n");
	printf("||-----------------------------------||\n");
	printf("||   |   |   | 7 || 5 | 8 |   ||   | 9 |   ||\n");
	printf("||===================================||\n");
	printf("||   |   | 3 || 9 |   |   || 1 |   | 7 ||\n");
	printf("||-----------------------------------||\n");
	printf("||   | 1 |   ||   | 7 | 6 ||   | 8 |   ||\n");
	printf("||-----------------------------------||\n");
	printf("||   |   | 5 || 8 |   |   ||   |   | 4 ||\n");
	printf("++=====================================++\n");

	system("PAUSE");
	return 0;
}
```

Peter Dobbs
BIEN1120

```
/*
In Class Challenge 2
This program prints three different phone numbers
Uses a whole bunch of printf statements
Author Peter Dobbs
Created: September 2015
*/

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

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

	//variable declaration
	char *phoneNum1 = "(123) 456-7890";
	char *phoneNum2 = "(098) 765-4321";

	printf("%s\n", phoneNum1);
	printf("%s\n", phoneNum2);

	//phoneNum1
	int areaCode1, prefix1, suffix1;
	areaCode1 = 414;
	prefix1 = 774;
	suffix1 = 9878;
	//phoneNum2
	int areaCode2, prefix2, suffix2;
	areaCode2 = 414;
	prefix2 = 429;
	suffix2 = 6622;

	//phoneNum1
	printf("(%d", areaCode1);
	printf(") %d", prefix1);
	printf("-%d\n", suffix1);
	//phoneNum2
	printf("(%d", areaCode2);
	printf(") %d", prefix2);
	printf("-%d\n", suffix2);

	//phoneNum3
	int areaCode3, prefix3, suffix3;
	areaCode2 = 8;
	prefix2 = 99;
	suffix2 = 199;
	//phoneNum3
	printf("(60%d", areaCode3);	//accounts for leading zeros
	printf(") 9%d", prefix3);
	printf("-0%d\n", suffix3);//accounts for leading zeros

	system("PAUSE");
	return 0;
}
```

Peter Dobbs
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```
/*
In Class Challenge 3
Robodialing:
Uses a loop to change phone number
Author Peter Dobbs
Created: 9/16/15
Updated: 9/21/15
*/

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

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

	//robodialing
	//starting number: (414) 555-0110
	//increment the phone number by one until you reach (414) 555-0111

	//(phoneArea) phonePref-phoneSuff
	int phoneArea = 414;
	int phonePref = 555;
	int phoneSuff = 9000;
	int i = 0;

//	for (i=0; i<10; i++){
////		printf("(%d) ", phoneArea);
////		printf("%d-", phonePref);
////		printf("%04d\n", phoneSuff);
//		if (phoneSuff <= 999){
//			printf("(%d) %d-%04d\n", phoneArea, phonePref, phoneSuff+i);
//		}
//		if (phoneSuff > 999){
//			printf("(%d) %d-%d\n", phoneArea, phonePref, phoneSuff+i);
//		}
//	}

	for(i=0; i<1000; i++){
		printf("(%d) %d-%d\n", phoneArea, phonePref, phoneSuff+i);
	}

	return 0;
}
```

Peter Dobbs
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```
/*
In Class Challenge 4
This program calculates the sum of numbers
between two given integers and the product
of those numbers, then finds the ratio of
the sum and the product. The range should be
exclusive
Author Peter Dobbs
Created 9/23/15
*/

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

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

	//variable declaration and initialization
	int a = 10;  //given integer 1
	int b = 20;  //given integer 2
	int i = 0;
	int range_var = b-(a+1);  //variable for range
	int range_array[range_var];	//array holding the range
	float sum = 0;
	float prod = 1;
	float ratio = 0;	//quotient of sum and product

	//print the range
	printf("Range = %i\n", range_var);

	for(i = 0; i<range_var; i++){
		range_array[i] = a+1;
		a++;
	}

	//sum of range(a to b)
	for(i = 0; i<range_var; i++){
		sum = sum + range_array[i];
	}
	printf("Sum: %g\n", sum);

	//product of range(a to b)
	for(i = 0; i<range_var; i++){
		prod = prod * range_array[i];
	}
	printf("Product: %g\n", prod);

	//calculate (sum of range(a to b))/(product of range(a to b))
	ratio = sum/prod;
	printf("Ratio: %g\n", ratio);

	system("PAUSE");
	return 0;
}
```

Peter Dobbs
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```
/*
In Class Challenge 5
This program robodials with user input
Peter Dobbs
9/28/2015
*/

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

int main(int argc, char *argv[]) {
	//increment the phone number by one until you reach (414) 555-0111

	//variable declaration //initialize to zero
	int phoneArea=0;	//variable for areacode
	int phonePref=0;	//variable for exchange/prefix
	int phoneSuff=0;	//variable for suffix
	int i = 0;

	//user input
	printf("Enter the area code:\n");
	scanf("%i", &phoneArea);  //takes input and assigns it to 'phoneArea'
	printf("Enter the exchange/prefix:\n");
	scanf("%i", &phonePref);  //takes input and assigns it to 'phonePref'
	printf("Enter the suffix:\n");
	scanf("%i", &phoneSuff);  //takes input and assigns it to 'phoneSuff'

	//prints phone list to console
	for (i=0; i<10; i++){
		if (phoneSuff < 1000){
			printf("(%d) %d-%04d\n", phoneArea, phonePref, phoneSuff+i);
		}
		if (phoneSuff >= 1000){
			printf("(%d) %d-%d\n", phoneArea, phonePref, phoneSuff+i);
		}
	}

	return 0;
}
```

Peter Dobbs
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```
/*
In Class Challenge 6
This program takes the input of a text file and
counts how many times the number 5 is listed.
It only works for files with less than 5000 numbers.
Peter N. Dobbs
10/5/2015
*/

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

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

	// local variable declaration and initialization
	float a[5000];	//array with n elements
	float sum = 0;	//to be used for sum of array elements
	float avg = 0;	//to be used for average of array elements
	int i;		//to be used as index for the for-loops
	int count;	//to be used for the number of integer usages
	int num = 0;
	FILE *fp; //the star(*) indicates the pointer.

	// open the file
	fp = fopen("in.txt", "r"); // 'r': read, 'w': write, 'a': append

	if (fp==NULL) {		// error catch
		printf("File not found\n");
		return 1;	// ends the program
	}

	i=0;
	while(fscanf(fp, "%g",&a[i])!=EOF){
		i++;
	}
	num = i;
	// close the file
	fclose(fp);

	count = 0;
	for (i=0; i<num; i++){
		if (a[i]==5) count++;
	}

	printf("5 is listed %i times\n", count); //should be 106 times

	system("PAUSE");
	return 0;
}
```

Peter Dobbs
BIEN1120

```
/*
avg1
This Program calculates the average of 3 hardcoded numbers
Uses float variables, arithmetic, printf
Author Peter Dobbs
Created 10/10/15
*/

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

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

	// declare variables
	float a;
	float b;
	float c;
	float avg;

	// assigning values
	a = 3;
	b = 5;
	c = 8;

	// calculating average
	avg = (a+b+c)/3.0;  //should be 5.3333333

	// print the result
	printf("The average of our three numbers is %f\n",avg);

	return 0;
}
```

Peter Dobbs
BIEN1120

```
/*
avg1challenge
This program calculates the avg of 4 numbers
Uses float variables, arithmetic, and printf
@author Peter N Dobbs
Created: 10/10/2015
*/

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

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

	// declare variables
	float a;
	float b;
	float c;
	float d;
	float avg;

	// assigning values
	a = 3;
	b = 5;
	c = 8;
	d = 4;

	// calculating average
	avg = (a+b+c+d)/4.0;

	// print the result
	printf("The average of our three numbers is %f\n",avg);

	return 0;
}
```

Peter Dobbs
BIEN1120

```
/*
avg2 - from Lesson 1c
This program calculates the average of 3 numbers
Uses array, arithmetic, printf
@author Peter N Dobbs
Created: 10/10/2015
*/

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

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

	// declare variables
	float a[3];  //a is a 3 element array
	float avg;

	// assigning values
	a[0] = 3;
	a[1] = 5;
	a[2] = 8;

	// calculating average
	avg = (a[0]+a[1]+a[2])/3.0;

	// print the result
	printf("The average of our three numbers is %f\n",avg);

	return 0;
}
```

Peter Dobbs
BIEN1120

```
/*
avg3 - from Lesson 1c
This program calculates the average of 3 numbers,
Uses an array and a loop.
@author Peter N Dobbs
Created: 10/10/2015
*/

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

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

	// declare variables
	float a[3];  //a is a 3 element array
	float sum;
	float avg;
	int i;

	// assigning values
	a[0] = 3;
	a[1] = 5;
	a[2] = 8;

	//new algorithm
/*
	sum = 0;
	i = 0;
	while(i<3){
		sum = sum + a[i];
		//to print int use d (decimal), to print float use f (float)
		printf("%d %f\n", i, sum);
		i++;   // much better than i=i+1
	}
*/
	sum = 0;
	for(i=0;i<3;i++){
		sum = sum + a[i];
	}
	avg = sum/3;

	// print the result
	printf("The average of our three numbers is %f\n",avg);

	return 0;
}
```

Peter Dobbs
BIEN1120

```
/*
avg3 - from Lesson 2a
This program calculates the average of 3 numbers,
Uses an array and a loop, introduces new sum algorithm.
@author Peter N Dobbs
Created: 10/10/2015
*/

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

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

	// declare variables
	float a[3];  //a is a 3 element array
	float sum;
	float avg;
	int i;

	// assigning values
	a[0] = 3;
	a[1] = 5;
	a[2] = 8;

	//new algorithm
/*
	sum = 0;
	i = 0;
	while(i<3){
		sum = sum + a[i];
		//to print int use d (decimal), to print float use f (float)
		printf("%d %f\n", i, sum);
		i++;   // much better than i=i+1
	}
*/
	sum = 0;
	for(i=0;i<3;i++){
		sum = sum + a[i];
	}
	avg = sum/3;

	// print the result
	printf("The average of our three numbers is %f\n",avg);

	return 0;
}
```

Peter Dobbs
BIEN1120

```
/*
avg5 - from Lesson 2b
This program calculates the average of n numbers,
Using an array and a loop, input entered using a text file
The name of the text file has to be in.txt
@author Peter N Dobbs
Created: 10/12/2015
*/

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

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

	// declare variables
	float a[500];//a is a 3 element array
	float sum;
	float avg;
	int i;
	int n;
	FILE *fp;
	n = 5;		// assign the number of points

	//open the file
	fp = fopen("in.txt","r"); //r stands for read
	if (fp==NULL) {			// error catch
		printf("File not found\n");
		return 1;	// ends the program
	}
	//assigning values
	for (i=0;i<n;i++){
		fscanf(fp,"%g",&a[i]);
	}
	//close the file
	fclose(fp);

	//algorithm for finding sum of array
	sum = 0;
	for(i=0;i<n;i++){
		sum = sum + a[i];
	}
	avg = sum/(n*1.0);

	// print the result
	printf("The average of our %d numbers is %f\n",n,avg);

	return 0;
}
```

Peter Dobbs
BIEN1120

```
/*
avg6
This program calculates the average of n numbers
in a text file where we don't know how
many numbers are in the file.
This program only works for files < 5000 points
This 'C' program was written by Peter N. Dobbs
10/4/2015
*/

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

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

	// local variable declaration and initialization
	float a[5000];	//array with n elements
	float sum = 0;	//to be used for sum of array elements
	float avg = 0;	//to be used for average of array elements
	int i = 0;		//to be used as index for the for-loops
	int num = 0; //to be used for how many numbers are averaged

	FILE *fp; //the star(*) indicates the pointer.

	// open the file
	fp = fopen("in.txt", "r"); // 'r': read, 'w': write, 'a': append

	if (fp==NULL) {			// error catch
		printf("File not found\n");
		return 0;	// ends the program
	}

	// assigning values to array a[num]
	i = 0;
	while (fscanf(fp,"%g",&a[i])!=EOF) /*EOF: End Of File*/ {
		i++;
	}
	num = i;

	// close the file
	fclose(fp);

	// algorithm for finding sum of array
	for (i=0;i<num;i++) {
		sum = sum + a[i];
	}

	// algorithm for finding average of array
	avg = sum/num;

	// print out results
	printf("the average of the %d numbers is %f\n",num,avg);

	return 0;
}
```