Aaron Williams

Assignment 3

6 June 2017

Problem 1:

Build a program that uses a single-dimension array to store 10 numbers input by the user. After inputting the numbers, the user should see a menu with two options to sort and print the numbers in ascending or descending order.

Output:

```
Ace:Assignment 3 A$ gcc problem_01.c -o 1
Ace:Assignment 3 A$ ./1

Please enter number 1: 2

Please enter number 2: 2.5

Please enter number 3: 4

Please enter number 4: 137

Please enter number 5: 6

Please enter number 6: 34

Please enter number 7: 45.678

Please enter number 8: 45

Please enter number 9: 9

Please enter number 10: 10
```

-Descending:

```
You have two sorting options, ascending or descending.
For ascending, enter 1. For descending, enter 2: 2

The array sorted in descending order:
137.00
 45.00
 45.00
 34.00
 10.00
  9.00
  6.00
  4.00
  2.50
  2.00
```

-Ascending:

```
You have two sorting options, ascending or descending.
For ascending, enter 1. For descending, enter 2: 1

The array sorted in ascending order:
   2.00
   2.50
   4.00
   6.00
   9.00
  10.00
  34.00
  45.00
  45.00
137.00
```

Problem 2:

Create a student GPA calculator. The program should prompt the user to enter up to 30 GPAs, which are stored in a single-dimension array. Each time the user enters a GPA, they should have the option to calculate the current GPA average or enter another GPA.

Output:

```
Ace:Assignment 3 A$ gcc problem_02.c -o 2
Ace:Assignment 3 A$ ./2

How many GPAs would you like to enter? (30 is the max.): 6

Enter GPA 1: 3.6

Would you like to calculate the current average? Enter Y or N: n

Enter GPA 2: 3.2

Would you like to calculate the current average? Enter Y or N: n

Enter GPA 3: 4.0

Would you like to calculate the current average? Enter Y or N: n
```

```
Enter GPA 4: 3.3

Would you like to calculate the current average? Enter Y or N: y

Current average = 3.53
Enter GPA 5: 2.4

Would you like to calculate the current average? Enter Y or N: n

Enter GPA 6: 2.7

Would you like to calculate the current average? Enter Y or N: n

Summary:
------------

GPA 1 = 3.60
GPA 2 = 3.20
GPA 3 = 4.00
GPA 4 = 3.30
GPA 5 = 2.40
GPA 6 = 2.70
Total average = 3.20
```

Problem 3:

Build a program the performs the following operations:
-Declares three pointer variables called iPtr of type int, cPtr of type char, and fFloat of type float.
-Declares three new variables called iNumber of int type, fNumber of float type, and cCharacter of char type.
-Assigns the address of each nonpointer variable to the matching pointer variable.
-Prints the value of each nonpointer variable.
-Prints the value of each pointer variable.
-Prints the address of each nonpointer variable.
-Prints the address of each pointer variable.

Output:

```
Ace:Assignment 3 A$ gcc problem_03.c -o 3
Ace:Assignment 3 A$ ./3

Please enter an integer: 2

Please enter a character: a

Please enter a float: 5.4

Nonpointer values:
----------------------
The value of iNumber is 2
The value of cCharacter is a
The value of fNumber is 5.400000
```

```
Pointer values:
-----------------------
The value of *iPtr is 2
The value of *cPtr is a
The value of *fFloat is 5.400000

Nonpointer addresses:
-----------------------
The address of iNumber is 0x7fff55106b94
The address of cCharacter is 0x7fff55106b93
The address of fNumber is 0x7fff55106b8c

Pointer addresses:
-----------------------
The address of *iPtr is 0x7fff55106b94
The address of *cPtr is 0x7fff55106b93
The address of *fFloat is 0x7fff55106b8c
```

Problem 4:

Create a dice rolling game. The game should allow a user to toss up to six dice at a time. Each toss of a die will be stored in a six-element integer array. The array is created in the main() function but passed to a new function called TossDie(). The TossDie() function will take care of generating random numbers from one to six and assigning them to the appropriate array element number.

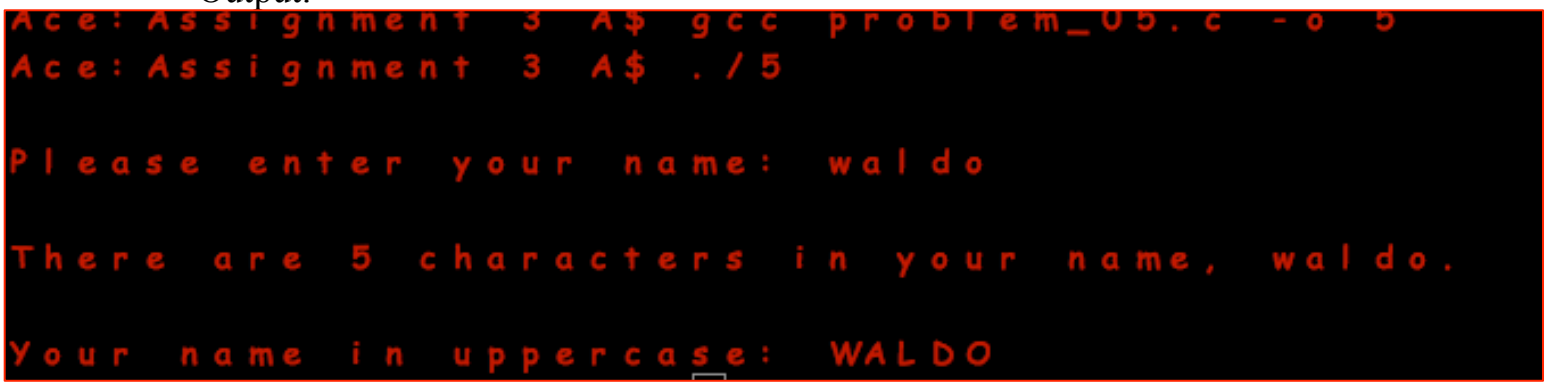
Output:

```
Ace:Assignment 3 A$ gcc problem_04.c -o 4
Ace:Assignment 3 A$ ./4

How many dice would you like to roll? Enter 1-6: 4

Dice 1 rolled a 2
Dice 2 rolled a 5
Dice 3 rolled a 5
Dice 4 rolled a 6
Do you want to roll again? Enter y or n: y

How many dice would you like to roll? Enter 1-6: 6

Dice 1 rolled a 5
Dice 2 rolled a 2
Dice 3 rolled a 5
Dice 4 rolled a 4
Dice 5 rolled a 1
Dice 6 rolled a 2
Do you want to roll again? Enter y or n: n
```

Problem 5:

Create a program the performs the following functions:
-Uses character arrays to read a users name from standard input.
-Tells the user how many characters are in their name.
-Displays the users name in uppercase.

Output:



Problem 6:

Build a program that uses an array of strings to store the following names:
-"Florida"
-"Oregon"
-"California"
-"Georgia"
Using the preceding array of strings, write your own sort() function to display each states name in alphabetical order using the strcmp() function.

Output: