CPSC 122 Homework 2

Your task is to implement the "arrayProgram.cpp" file based off the function definitions in the .h file. The goal is to gain practice using pointers with arrays, and gain experience using pointer arithmetic to move through a data structure. You'll also practice file I/O. At the end of this assignment you should have a good handle on how memory addresses map to different elements of an array, and how we can use pointers to traverse these addresses.

Overview:
- The program will read integers from a file "data.dat" that should be located in the same directory as your other source code files.
- There is one value per line in the .dat file
- These values are read and put into an integer array
- The program performs the file I/O steps before printing the menu.
- Upon printing the menu, the program will give the user several choices to interact with:

```
---------------File Read---------------
--Reading from file: "data.dat"
--Successfully read 7 values from file.
---------------------------------------


---------------------------------------
Program Options:
---------------------------------------
1. Print the array
2. Print the array as chars
3. Print Memory Map
4. Exit
Enter a choice: ▊
```

- Model your output against my example here. Notice, when the program starts a message is printed indicating the file read was successful. This only happens once, then the menu is printed and waits for the user to enter a value.

- The menu will execute each task corresponding to the choices 1, 2, 3, or 4. The menu will be reprinted after each task, except if the user enters 4, the program exits.

```
Enter a choice: 1

71 79 90 65 71 83 33
---------------------------------------
Program Options:
---------------------------------------
1. Print the array
2. Print the array as chars
3. Print Memory Map
4. Exit
Enter a choice: ▊
```

```
Enter a choice: 2

G O Z A G S !
---------------------------------------
Program Options:
---------------------------------------
1. Print the array
2. Print the array as chars
3. Print Memory Map
4. Exit
Enter a choice: ▊
```

```
Enter a choice: 3

ptr address --> address of value | value

0x16ce1f36c --> 0x16ce1f36c | 71
0x16ce1f36c --> 0x16ce1f370 | 79
0x16ce1f36c --> 0x16ce1f374 | 90
0x16ce1f36c --> 0x16ce1f378 | 65
0x16ce1f36c --> 0x16ce1f37c | 71
0x16ce1f36c --> 0x16ce1f380 | 83
0x16ce1f36c --> 0x16ce1f384 | 33


----------------------------------------
Program Options:
----------------------------------------
1. Print the array
2. Print the array as chars
3. Print Memory Map
4. Exit
Enter a choice: ▉
```

```
----------------------------------------
Program Options:
----------------------------------------
1. Print the array
2. Print the array as chars
3. Print Memory Map
4. Exit
Enter a choice: 4
Exiting program...
```

- If the user enters an invalid selection, a message is printed telling the user what went wrong and the menu is reprinted.

```
----------------------------------------
Program Options:
----------------------------------------
1. Print the array
2. Print the array as chars
3. Print Memory Map
4. Exit
Enter a choice: 7
--Error: Invalid choice! try again.
----------------------------------------
Program Options:
----------------------------------------
1. Print the array
2. Print the array as chars
3. Print Memory Map
4. Exit
Enter a choice: ▉
```

- Do not modify main.cpp, the .h file, data.dat, or the Makefile.
- Submission: Put all your completed work into a folder with your name and assignment number, then zip up that folder and submit the .zip to canvas by the due date.

  Your directory structure inside the .zip for your submission should look like this:

```
.
├── BryanFischer_HW2
│   ├── Makefile
│   ├── arrayProgram.cpp
│   ├── arrayProgram.h
│   ├── data.dat
│   └── main.cpp
```