COMP10120 Practical Set 5: Pointers

Please read the questions carefully. Name each program based on your student number, the practical set number and question number. For this set (set5), question 1 should be named 1234567s5q1.c where your student number replaces 1234567. All questions that you are submitting can be zipped into a single file called 1234567s5.zip, where 1234567 is your student number and s5 refers to set 5. Please also include a readme.txt file which says which compiler you used to test your implementation. This zipped file can be submitted via Moodle for grading.

Part 1

1. Write a C Program to demonstrate pointers to functions. The program should contain three functions: reverseArray, randomiseArray and printArray. The function prototypes and array initialisation are given below:

```
void reverseArray(int arraySize, int a[]);
void randomiseArray(int arraySize, int a[]);
void printArray(int arraySize, int a[], void (*arrayFunction)(int arraySize, int a[]));

int myArray = {2,4,6,8,10,12,14,16,18,20};
```

   reverseArray should swap reverse the order of all elements in an array; randomiseArray should randomly mix the order of elements in an array; printArray should print the contents of the array in reverse order or random order depending on user input. **See lecture notes for examples.**

2. Write a C Program which contains 6 functions: multiply, add, divide, subtract, modulus, power. The names are indicative of the functionality of each function. The user should be prompted for two **integers** and asked to select from functions 1 to 6. The program will then perform the correct function and return the result. The functions should be stored in arrays. The program must not contain any form of the *if statement* and must use *function pointers to create the menu-driven system.*

Portfolio Ideas

1. Everyone is interested in the public's opinion on the issues of the day. Write a C Program that asks users to rate how important different issues (health, economy, housing and transport.) are to them by rating them out of ten. Select topics which you are interested in. After asking for the rating of issues, the program should ask the questions again for the next user and so on. After the last user has indicated that there are no more users, the program should summarise the results, showing which issues had the highest and lowest rating. Some skeleton code (opinion_poll.c) has been provided for this question and you must complete it (parts indicated by ^^ in comments).

   Hint: A good approach would be to increment the value of response for a particular issue rating. We have looked at this in lectures previously.
   Note: The question demonstrates the use of arrays of pointers. ***See the lecture notes about this important feature and relate it to skeleton code***

2. Write a C Program that extends the program you wrote for Question 3 above. The new program should have a function to calculate the average rating for each of the issues and be able to return that.