COMP2100 Workshop Week 5

Pointers: dynamic memory allocation

Consider the following C code segment. Assume `n` is initialized with 5.

```
1: int *intArray, *intArrP;
2: intArray = (int *)malloc(sizeof(int) * (n+1));
3: *intArray = n;
4: intArrP = intArray+1;
5: for (int i = 0; i < intArrP[-1]; i++)
6:    *(intArrP + i) = i;
7: free (intArray);
```

1. What is the size of memory malloc allocates?

2. Sketch `intArray` after Step 3.

3. Sketch `intArrP` after Step 4.

4. Sketch `intArray` after Step 6.

Function pointers

Consider the `qsort` example program in page 10 of 'C Programming Notes for Data File Lab'.

1. Try the program.

2. Modify the program, so that it reads an arbitrary number of integers from `stdin` until the user enters either EOF (Ctrl-D) or invalid input. These numbers should be stored in an array with dynamically allocated memory instead of a static array.

3. Modify your solution program for Question 2 above, so that it can deal with an array of `char` arrays (max of 255 chars). In particular, the user's input is (white)space-separated strings which should be stored in an array of strings and sorted based on the order of the strings.