Computer Science G11 at The Dragon Academy
Term 2 Test 1

January 25, 2019

- All 6 questions have the same weight.

- Write your code in separate files and send them attached in one single email with subject "Term 2 test".

- Try to write your code in as simple a way as possible.

1. (KTIca) What does the following code print and why? Assume the necessary libraries have been included.

```
bool* p_b;
short* p_s;
int* p_i;
float* p_f;
long double* p_ld;
printf("%lu %lu %lu %lu %lu \n",sizeof(p_b),sizeof(p_s),sizeof(p_i),sizeof(p_f),sizeof(p_ld));
```

2. (KticA) Write the code to test your answer to question 1.

3. (KtiCa) What's the best way to name each of the following types? Your answer must be not only technically correct, but also be the easiest and more meaningful way to think about each type.

    (a) `int* n`
    (b) `char* n`
    (c) `char** n`
    (d) `char*** n`

4. (KtiCa) Write the full code, i.e., including necessary libraries, of a program that reads a file provided by the user and **appends** to it the N copies of the line "*This is takes a lot of type if I haven't practiced it enough, even with my notes available*". The integer N is provide by the user as second argument when calling the program. Called the program "`test-append`". Example of usage: `./test-append testfile.txt 5`

5. (KticA) Consider the following sum with $n = 0$ and $m = 10$: $\sum_{i=n}^{i=m} \left(-(n+1)*i+i^2\right) = 0+0+2+6+12+\ldots+72+90$. Write a program called `sum` that takes two integers from the command line, n and m, and prints

    - the partial sum at each iteration step
    - the final sum value.

    The output **must match exactly the format of the following example**. Example usage and output:
    `./sum -1 3`

    ```
    -1 1
     0 0
     1 1
     2 5
     3 14
    The total sum is 14
    ```

NOTE: In order to read those integers from the command line into an int, you will need to use the function `int atoi(const char *str)` from the `stdlib.h` library.

6. (KtiCa) Write a program called `sum-func` that does exactly the same as in 5 but all the calculation and printing is done in a function separate from main.