CS 284: Mid-Term (50 Minutes) – Fall 2020 – Topic 2

October 16, 2020

Student Name:

Honor Pledge:

Grade sheet:

Problem 1 (10 points)	
Problem 2 (20 points)	

Problems

Problem 1. Indicate for each of the following code fragments their approximate worst-case running time via a polynomial T and the big-$\mathcal{O}$ class of functions to which the polynomial belongs. You may assume that $n > 2$. There is no need to supply the constants c and n_0. In case you might require it, here is the formula for the sum of logarithms: $\log_2(xy) = \log_2 x + \log_2 y$.

```
for(int j=n; j>1; j--) {
    for(int i=1; i<j; i=i*2) {
         System.out.println("hello");
    }
  }
```

Problem 2. Implement the following operation, to be included in class `SLL`:

```
public static SLL<String> to_list(SLL<Pair<String,Integer>> h)
```

that builds a list from the string histogram given as an argument. A *string histogram* is just a list of pairs of strings and numbers (integers greater than zero, meant to indicate the number of repetitions or occurrences of the string). For example, if the string histogram is

```
[("a",1),("b",4),("c",2),("k",3),("g",2)]
```

then the generated list should be `[a,b,b,b,b,c,c,k,k,k,g,g]` since there should be 1 copy of `"a"`, 4 copies of `"b"`, 2 copies of `"c"`, 3 copies of `"k"` and 2 copies of `"g"`.

You must complete the stub provided in Canvas. Any methods not in the stub that you use, you must implement.

Note: It is best to import the stub into your project. Right-click on the src folder of your project, click on "Import", then "File System", then "Browse". Locate the file "SLL" and click on it. Place it in a package called "topic2".