

THIRD QUIZ

You have 15 minutes from the start of class to complete this quiz. Read the questions with care; work with deliberate speed. Don't give us more than we ask for. The usual instructions apply. Good luck!

Problem 1 (10 points)

(a.1) (5 points) What is the polynomial representing the execution time of the following code, in terms of n ? Count assignments (except in for-loops) and method calls. Showing your work will help you get partial credit.

```
System.out.println("The sun did not shine, it was too wet to play.");
System.out.println("So we sat in the house all that cold, cold wet day.");
System.out.println("I sat there with Sally. We sat there, we two.");
for (i=0; i<n; i++)
{
    catInTheHat(i);
    System.out.println("And I said, 'How I wish we had something to do!'");
    for (j=0; j<n; j=j+5)
    {
        thing1(j);
        System.out.println("Too wet to go out and too cold to play ball,");
        System.out.println("So we sat in the house. We did nothing at all.");
        thing2(j+5);
    }
    System.out.println("And so all we could do was just sit, sit, sit, sit.");
}
System.out.println("And we did not like it, not one little bit.");
```

(a.2) (2 points) What is the O -notation of the execution time of the code in part (a.1)?

(b) (3 points) Give the O -notation, as explained in class, of each of the following polynomials. Read them carefully. Choose each answer from this list: $O(1)$, $O(\log n)$, $O(n)$, $O(n \log n)$, $O(n^2)$, $O(n^3)$, $O(n^4)$, $O(e^n)$.

(b.1) $50 + 35n + 73 \log n$

(b.2) $12n^3 + 200n^2 + 3750n + 92697$

(b.3) $\log n + 12$

Problem 2 (15 points)

Attached is a copy of the ArrayList version of the restaurants program. We are going to modify the code to accept an additional command (“c”), which will ask the user for a cuisine and print the cheapest restaurant in the collection that serves that cuisine.

(a) (2 points) In the Q3RPArrayList class on the first page (the “controller” class containing the main method), four lines of code have been added to accept this command. On the page of code itself, circle those four lines.

(b) (13 points) Complete the body of the `findCheapestByCuisine` method according to the specifications shown in the code. You may write on the page of code itself, but don’t forget to put your name on that page (especially if you detach it).