

CS 206 Midterm Makeup 3

16 points possible.

Rules: you may use any computer resource; do not discuss this with any person. Take as long as you need. Turn in your answer on Tuesday, Nov 2.

Hashtables: 14 points max

1. Suppose you have a hashtable defined to have keys as Strings and values as some other Object. The hash function of this hashtable is implemented as an accumulator where the accumulation function is defined to be:

```
int acc=0;
for (int i=0; i<s.length(); i++) {
    acc += (int)(s.charAt(i)-'a')*i;
}
```

Is this a good hash function? A full credit answer to this questions will begin by defining “good”. The answer then will defend “yes” or “no” (with respect to the definition) with a set of annotated examples that illustrate cases where the accumulator behaves well — or poorly. (By “annotated example” I mean that there is an explanation of why the example you show is good or bad.)

2. The usual discussion of Hashtables says that they require $O(1)$ time for a single `get()` or a single `put()`. This is false. Discuss at

least 2 reasons why this is false. Why do computer scientists blithely ignore these reasons and say that hashtables require $O(1)$ time?