

Andrew Plaza

## Homework 6

**a.)** Duck fits into the 001 bucket next to 'rat' without further modification

**b.)** Yak can't be put into bucket [010] because it's full. So, we have to split that bucket into two.

The resulting bucket will be as such:

```
|010/ -----> | Dog | Yak \
```

```
|011/ -----> | Ant | Cat \
```

**c.)**

Bear is deleted, and since no sibling exists no merging occurs.

**d.)** Bug is deleted, and since the bucket `000` has a sibling with two open spots, we are able to merge those buckets (and change the pointers to correspond correctly) like so:

```
|000| ---  
      |  
      |-----> |-----| |
                      | PIG | COW | RAT |  
|001|-----> |-----|
```

**e.)** Inserting GORN into bucket 000 is not possible since that bucket is full. So, we must split buckets 000 into 0000 and 0001. Consequently, we must increase the directory depth of the rest of the hash to match.

```
| ---- |  
| 0000 | ----> | PIG |  
| 0001 | ----> | BUG | COW | GORN |  
| 0010 | ----> | RAT |  
| .... |
```

**f.)** `ANT` is removed from bucket 7, `111` without needing any other changes.