Prime Factors

Determine the best and worst case runtime of `prime_factors` in $\Theta(.)$ notation as a function of `N`.

```
1  int prime_factors(int N) {
2      int factor = 2;
3      int count = 0;
4      while (factor * factor <= N) {
5          while (N % factor == 0) {
6              System.out.println(factor);
7              count += 1;
8              N = N / factor;
9          }
10         factor += 1;
11     }
12     return count;
13 }
```

Best Case: $\Theta($ $)$, Worst Case: $\Theta($ $)$