

```

x = 2388 (for DOG):
i   | b_i   |           | z
-----
    |       |           | 1
12  | 1     | 1^2 * 2388 | 2388
11  | 0     | 2388^2      | 3578
10  | 0     | 3578^2      | 26380
9   | 1     | 26380^2 * 2388 | 393
8   | 1     | 393^2 * 2388  | 19698
7   | 0     | 19698^2      | 11821
6   | 0     | 11821^2      | 17435
5   | 1     | 17435^2 * 2388 | 8167
4   | 1     | 8167^2 * 2388  | 30153
3   | 0     | 30153^2      | 30454
2   | 0     | 30454^2      | 17682
1   | 0     | 17682^2      | 24132
0   | 1     | 24132^2 * 2388 | 15407
2388^4913 mod 31313 = 15407

```

```

x = 1371 (for CAT):
i   | b_i   |           | z
-----
    |       |           | 1
12  | 1     | 1^2 * 1371  | 1371
11  | 0     | 1371^2      | 861
10  | 0     | 861^2       | 21122
9   | 1     | 21122^2 * 1371 | 10339
8   | 1     | 10339^2 * 1371 | 17937
7   | 0     | 17937^2     | 26207
6   | 0     | 26207^2     | 18820
5   | 1     | 18820^2 * 1371 | 3655
4   | 1     | 3655^2 * 1371  | 30384
3   | 0     | 30384^2     | 17590
2   | 0     | 17590^2     | 4347
1   | 0     | 4347^2      | 14670
0   | 1     | 14670^2 * 1371 | 25076
1371^4913 mod 31313 = 25076

```