GPU Programming Hw#1
Part 3 Report

There are 2 parts in my bonus part. The first is as the example on the spec: change every 2 character. The other is to turn all the prime position of a word into '*' sign. And the 2 parts happen by chance with random.

Part 1

To swap every 2 character, here are the steps:

- Point out all the character at an even position, and 0 is excluded
- Exchange the character with the previous one

After these 2 steps, all the character on the odd position is changed with the next one and those on the end will still remain at the same position.

```
__global__ void switch2Char(char *text, int *pos, int *head, int
text_size, int n_head) {
    int idx = blockIdx.x*blockDim.x + threadIdx.x;
    if(idx >= text_size) {
        return;
    }
    if(pos[idx]%2 == 0 && pos[idx] != 0) {
        // should switch with the previous character
        char temp;
        temp = text[idx];
        text[idx] = text[idx-1];
        text[idx-1] = temp;
    }
}
```

Part 2:

To turn all the prime position characters into '*', we have to calculate which ones are at the prime position. Here are the steps:

- Implement a function that checks whether a number is prime.
- If the number is marked as prime, we should turn the character of that position into '*'.

By these 2 steps, all the character at a prime position is turned into '*'.

```
__device__ bool checkPrime(int num) {
    if(num == 1) {
```

```
            return false;
        }
        for(int i=2; i<num; i++) {
            if(num%i == 0) {
                return false;
            }
        }
        return true;
}

__global__ void convertPrimeToStar(char *text, int *pos, int text_size) {
        int idx = blockIdx.x*blockDim.x + threadIdx.x;
        if(idx >= text_size) {
            return;
        }
        if(checkPrime(pos[idx])) {
            text[idx] = '*';
        }
}
```