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Section: ML

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Hash function for Robin Karp:

```
#include <iostream>
```

```
#include <string>
```

```
using namespace std;
```

```
const int p = 31; // prime number
```

```
const int m = 1e9 + 9; // large prime number
```

```
int robin_karp_hash(const string s) {
```

```
    long long hash_value = 0;
```

```
    long long p_power = 1;
```

```
    for (char c : s) {
```

```
        hash_value = (hash_value + (c - 'a' + 1) *  
                        p_power) % m;
```

```
        p_power = (p_power * p) % m;
```

```
    }
```

```
    return hash_value;
```

```
}
```

```
int main() {
```

```
    string str = "hello";
```

```

cout << "Hash of " << str << " : " << rabin_karp_hash_t
(str) << endl;
return 0;
}

```

example :

Text = A B C C D D A E F G

pattern = C D D

let assign a numerical value.

A	B	C	D	E	F	G
↓	↓	↓	↓	↓	↓	↓
1	2	3	4	5	6	7

$$\begin{aligned}
 h(x) = \text{Hash value of text} &= C + D + D \\
 &= 3 + 4 + 4 \\
 &= 11
 \end{aligned}$$