COP 3502 4/9/26

Plan for today

Code up all 3 techniques:

1) linear probing

2) quadratic probing

3) separate chaining hashing

to solve the same kattis problems:

Shiritori

1 method to eval a polynomial

$$(3x^4 + 2x^3 + 0x^2 + 1 \cdot x + 4) \% M$$

c[0] c[1] c[2] c[3] c[4]

```
int res = 0;                          n [5]
for (int i=0; i<n; i++)
    res = (x*res + c[i]) % M
```

Store string in base 27

A=1, B=2, ... Z=26

Problem w/ linear probing is clustering

all filled increases probability of a hit in this cluster

Indexes we try

orig idx is x.

x

$(x+1) \% M$

$(x+4) \% M$

$(x+9) \% M$

$(x+16) \% M$

...

In code

```
i = 1
while ( ) {
    x += i;
    i += 2;
}
```

$x \to x+1 \to x+4 \to x+9$

i $1 \to 3 \to 5 \to 7$

Linear Chaining Hashing