

# Running Times *(Don't memorize these equations, no need.)*

*The expected number of probes for find(key) under SUHA*

## **Linear Probing:**

- Successful:  $\frac{1}{2}(1 + 1/(1-\alpha))$
- Unsuccessful:  $\frac{1}{2}(1 + 1/(1-\alpha))^2$

## **Double Hashing:**

- Successful:  $1/\alpha * \ln(1/(1-\alpha))$
- Unsuccessful:  $1/(1-\alpha)$

## **Separate Chaining:**

- Successful:  $1 + \alpha/2$
- Unsuccessful:  $1 + \alpha$

**Instead, observe:**

- **As  $\alpha$  increases:**

- **If  $\alpha$  is constant:**