













**THE UNIVERSITY OF CHICAGO**

1. The first step is to identify the problem. This involves understanding the current situation, identifying the problem, and determining the scope of the problem.

2. The second step is to analyze the problem. This involves gathering information, identifying the causes of the problem, and determining the impact of the problem.

3. The third step is to develop a solution. This involves brainstorming ideas, evaluating the ideas, and selecting the best solution.

4. The fourth step is to implement the solution. This involves developing a plan, executing the plan, and monitoring the results.

5. The fifth step is to evaluate the solution. This involves assessing the effectiveness of the solution, identifying any problems, and making adjustments as needed.









PREFIX recipe: <http://example.com/food/recipe/>  
PREFIX food: <http://example.com/food/types/>

SELECT ?recipe  
WHERE {  
 ?recipe recipe:ingredient ?i .  
 ?i recipe:type food:flour .  
 ?i recipe:unit recipe:cups .  
 ?i recipe:quantity ?q .  
 FILTER (?q <= 2) }

Query

▶ All recipes using  $\leq 2$  cups of flour

```
:find ?recipe
:where  [?recipe :ingredient ?i]
        [?i :type :flour]
        [?i :unit :cups]
        [?i :quantity ?q]
        [(<= ?q 2)]
```



# Query

- All recipes using  $\leq 2$  cups of flour

```
PREFIX recipe: <http://example.com/food/recipe/>
```

```
PREFIX food: <http://example.com/food/types/>
```

```
SELECT ?recipe
```

```
WHERE {
```

```
  ?recipe recipe:ingredient ?i .
```

```
  ?i recipe:type food:flour .
```

```
  ?i recipe:unit recipe:cups .
```

```
  ?i recipe:quantity ?q .
```

```
  FILTER (?q <= 2) }
```



# Database Requirements

- ▶ Storage
- ▶ Finding Data from Patterns
- ▶ Join operations
- ▶ Filter operations
- ▶ Graph algorithms  
*traversal, cluster analysis, etc.*