• Recursion Exercise
  - Given

```
parent(john, paul). /* paul is john's parent */
parent(paul, tom). /* tom is paul's parent */
parent(tom, mary). /* mary is tom's parent */
```

- Ask student to write a rule to determine if X is Y's ancestor.

- Solution:

```
ancestor(X, Y) :- parent(X, Y). /* someone is your ancestor if they are your parents */
ancestor(X, Y) :- parent(X, Z), /* or somebody is your ancestor if they are the parent */
               ancestor(Z, Y). /* of someone who is your ancestor */
```

- Query:

```
ancestor(john, tom).
```

• Recursion Exercise
  - Given

```
prerequisite(cs231, cs151).
prerequisite(cs232, cs231).
prerequisite(cs333, cs231).
prerequisite(cs421, cs333).
```

- Ask students to write a rule that can find all prerequisites of a course.

- Solution:

```
all_prerequisite(X, Y) :- prerequisite(X, Y).
all_prerequisite(X, Y) :- prerequisite(X, Z), all_prerequisite(Z, Y).
```

- Query:

```
all_prerequisite(cs421, X).
```