

# Questions

## CSC230 Database Technologies for Analytics

21 October 2019

1. Before the invention of electronic databases, organizations stored information in paper files in manila folders in steel filing cabinets.

What were some of the advantages gained by moving to electronic databases?

- remote access
- simultaneous access
- faster access
- more compact storage
- safer, more secure—easy to make backups

2. A set is a collection of distinct elements.

$$S_0 = \{0, 1, 2\}$$

$$S_1 = \{a, b, c\}$$

What is the Cartesian product of two sets?

$$S_0 \times S_1 = \{(0, a), (0, b), (0, c), (1, a), (1, b), (1, c), (2, a), (2, b), (2, c)\}$$

3. Let's suppose that we have three sets.

$$S_0 = \{0, 1\}$$

$$S_1 = \{a, b\}$$

$$S_2 = \{\alpha, \beta\}$$

What is the Cartesian product of three sets?

$$S_0 \times S_1 \times S_2 = ?$$

4. Here is a relation.

$$R = \{(apple, red), (banana, yellow), (lime, green)\}$$

Represent this relation with a table.

<b>Fruit</b>	<b>Color</b>
apple	red
banana	yellow
lime	green

- (a) How many rows does this table have?
  - (b) How many columns does this table have?
  - (c) How might you label the columns?
5. What is the mathematical foundation for relational database technology?
6. Who wrote the paper that spurred the development of relational database management systems? Where? When?
7. SQL is a (mostly) declarative language. How does a declarative language differ from a procedural language?
8. Industry has strongly preferred relational databases for a long time. Alternatives to relational databases have emerged in recent years. What does “NoSQL” mean?