

- b. Find the ID and name of each instructor in a department located in the building “Watson”.
- c. Find the ID and name of each student who has taken at least one course in the “Comp. Sci.” department.
- d. Find the ID and name of each student who has taken at least one course section in the year 2018.
- e. Find the ID and name of each student who has not taken any course section in the year 2018.

Further Reading

E. F. Codd of the IBM San Jose Research Laboratory proposed the relational model in the late 1960s ([Codd (1970)]). In that paper, Codd also introduced the original definition of relational algebra. This work led to the prestigious ACM Turing Award to Codd in 1981 ([Codd (1982)]).

After E. F. Codd introduced the relational model, an expansive theory developed around the relational model pertaining to schema design and the expressive power of various relational languages. Several classic texts cover relational database theory, including [Maier (1983)] (which is available free, online), and [Abiteboul et al. (1995)].

Codd’s original paper inspired several research projects that were formed in the mid to late 1970s with the goal of constructing practical relational database systems, including System R at the IBM San Jose Research Laboratory, Ingres at the University of California at Berkeley, and Query-by-Example at the IBM T. J. Watson Research Center. The Oracle database was developed commercially at the same time.

Many relational database products are now commercially available. These include IBM’s DB2 and Informix, Oracle, Microsoft SQL Server, and Sybase and HANA from SAP. Popular open-source relational database systems include MySQL and PostgreSQL. Hive and Spark are widely used systems that support parallel execution of queries across large numbers of computers.

Bibliography

[Abiteboul et al. (1995)] S. Abiteboul, R. Hull, and V. Vianu, *Foundations of Databases*, Addison Wesley (1995).

[Codd (1970)] E. F. Codd, “A Relational Model for Large Shared Data Banks”, *Communications of the ACM*, Volume 13, Number 6 (1970), pages 377–387.

[Codd (1982)] E. F. Codd, “The 1981 ACM Turing Award Lecture: Relational Database: A Practical Foundation for Productivity”, *Communications of the ACM*, Volume 25, Number 2 (1982), pages 109–117.