# Data Mining

## Data Warehouse and Mediator (Part B)

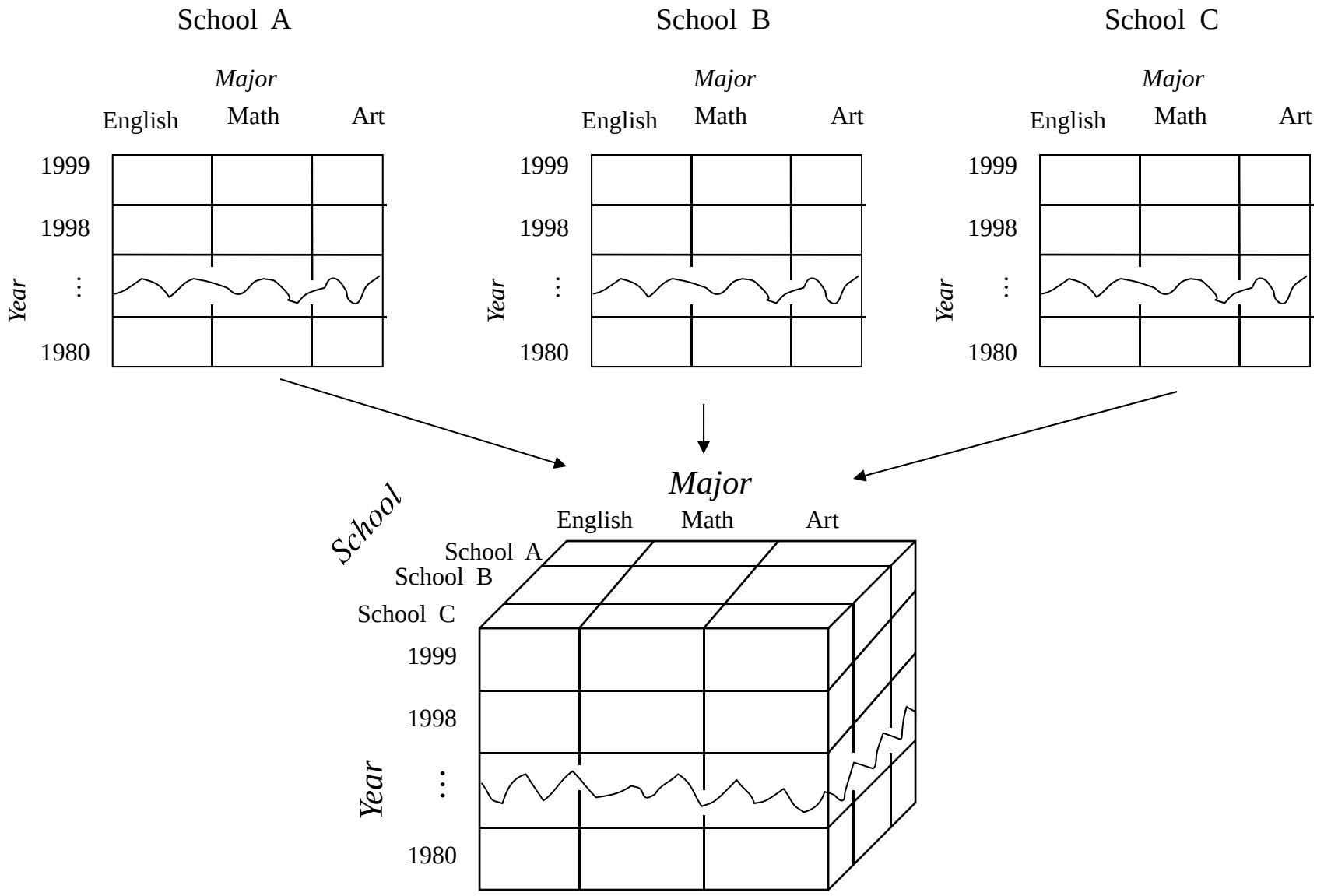
**Dr. Jason T.L. Wang, Professor**

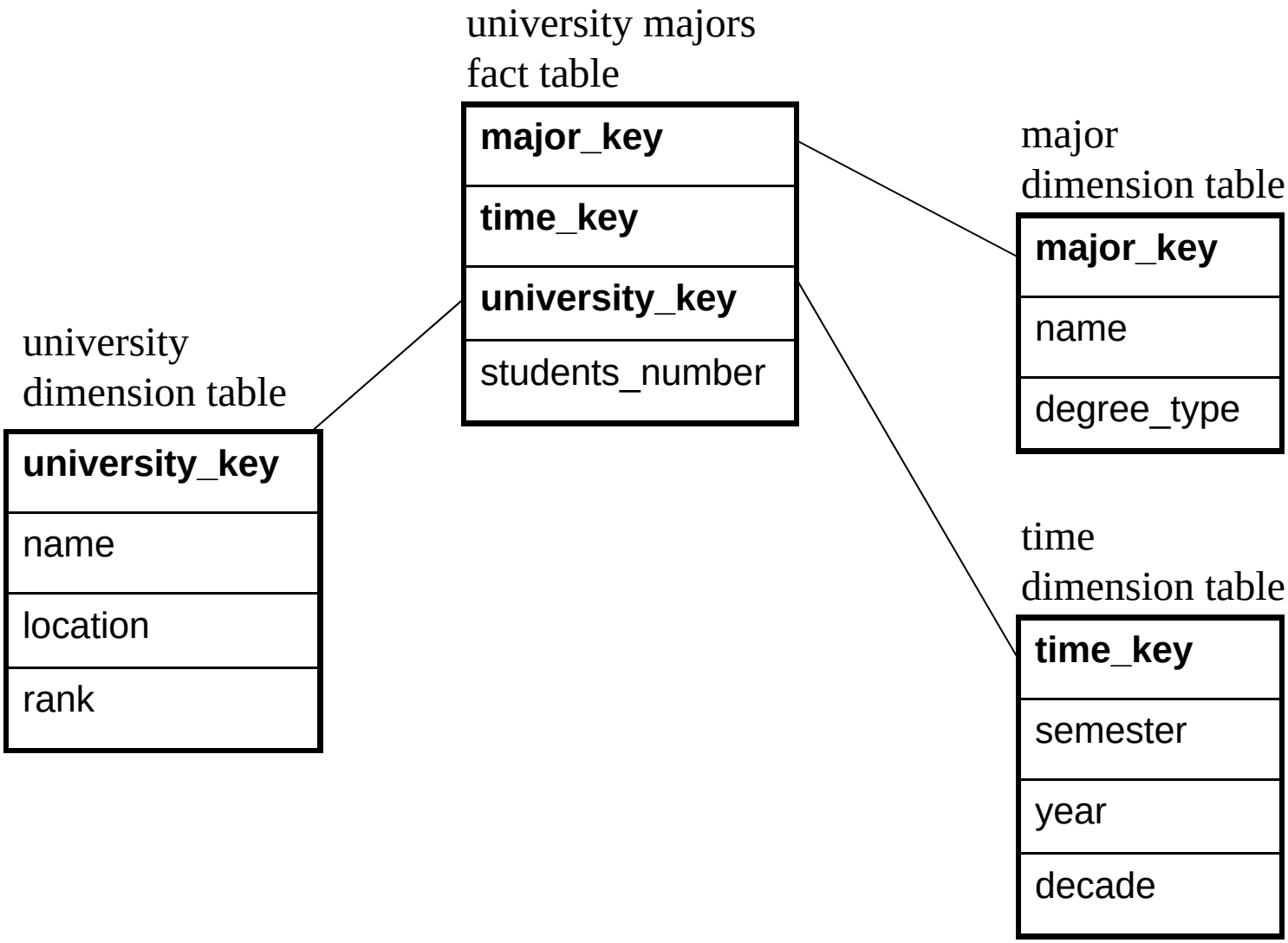
**Department of Computer Science**

**New Jersey Institute of Technology**

# Where am I?

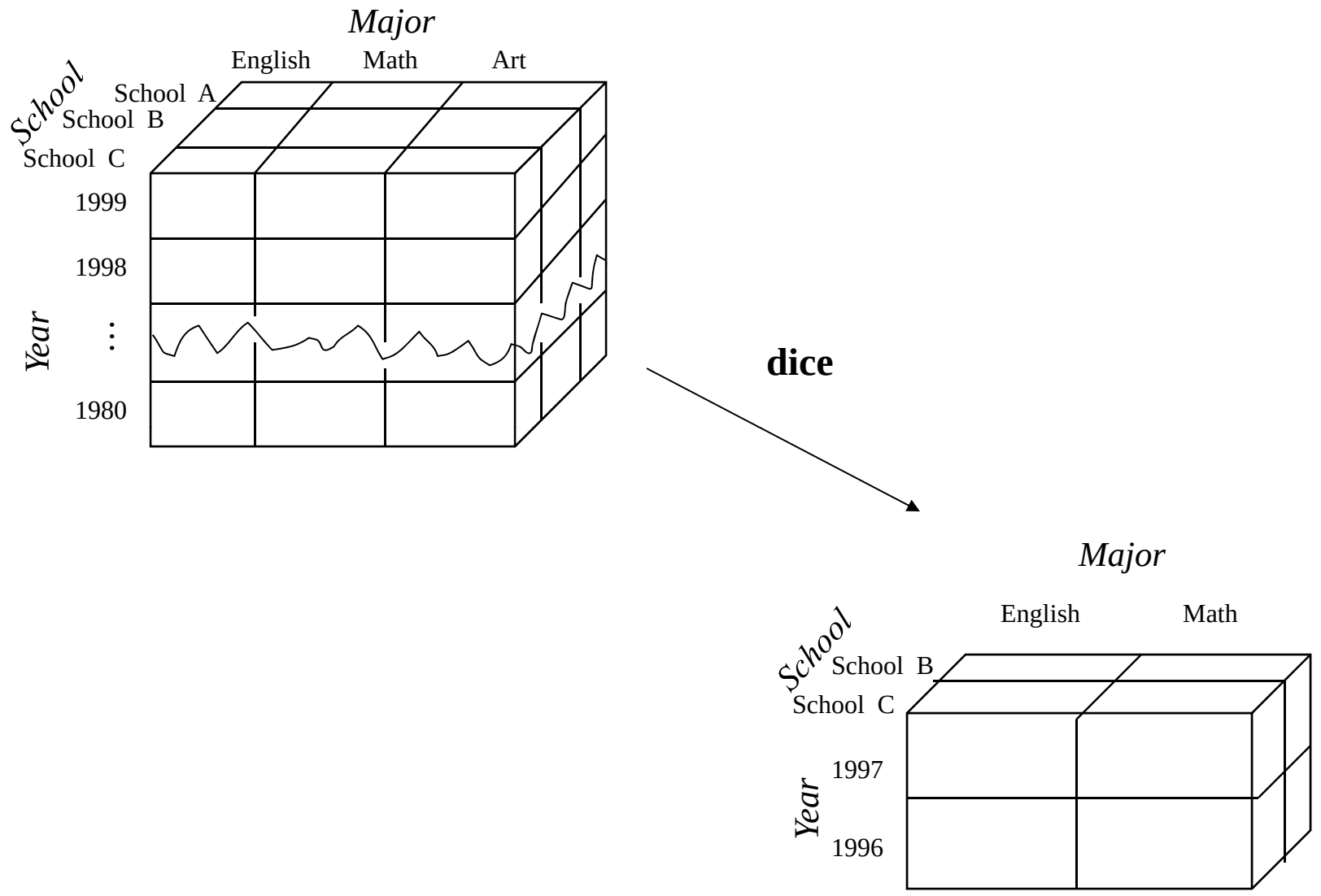
- Part A presents an introduction to data warehousing, mediators and wrappers.
- Part B presents an example of data warehouses and describes how OLAP operations work on the example data warehouse.


School A
School B
School C
Major
English
Math
Art
1999
1998
1980
Year
School
Major
English
Math
Art
School A
School B
School C
1999
1998
1980
Year


university majors
fact table
major_key
time_key
university_key
students_number
major
dimension table
major_key
name
degree_type
university
dimension table
university_key
name
location
rank
time
dimension table
time_key
semester
year
decade

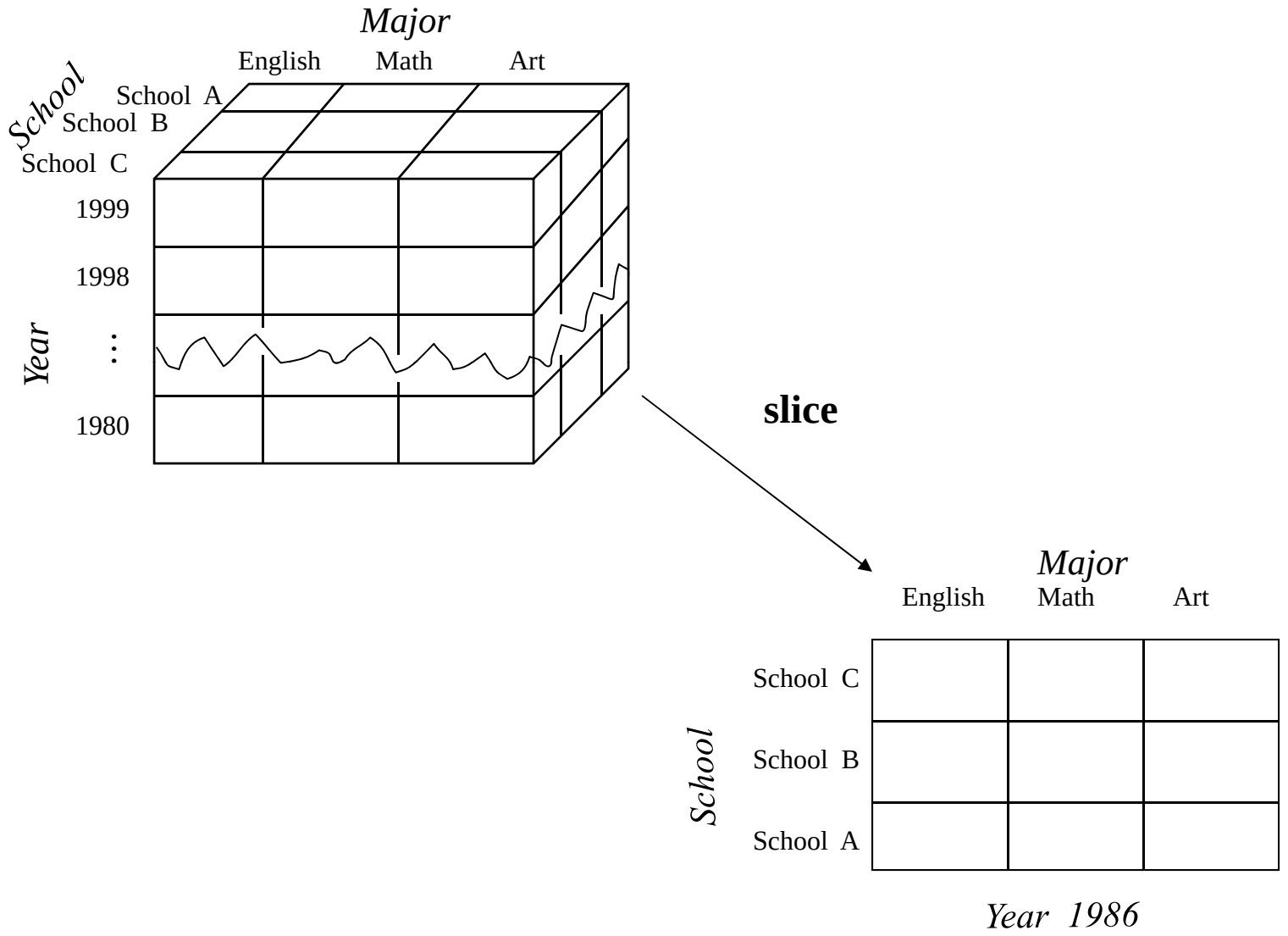
# OLAP Operation

- Dice – performs selection on one or more dimensions of a data cube (dice for *school* = "B" or "C" and *Year* = 1997 or 1996 and *Major* = "English" or "Math").


Major
English
Math
Art
School
School A
School B
School C
1999
1998
Year
1980
dice
Major
English
Math
School
School B
School C
1997
Year
1996

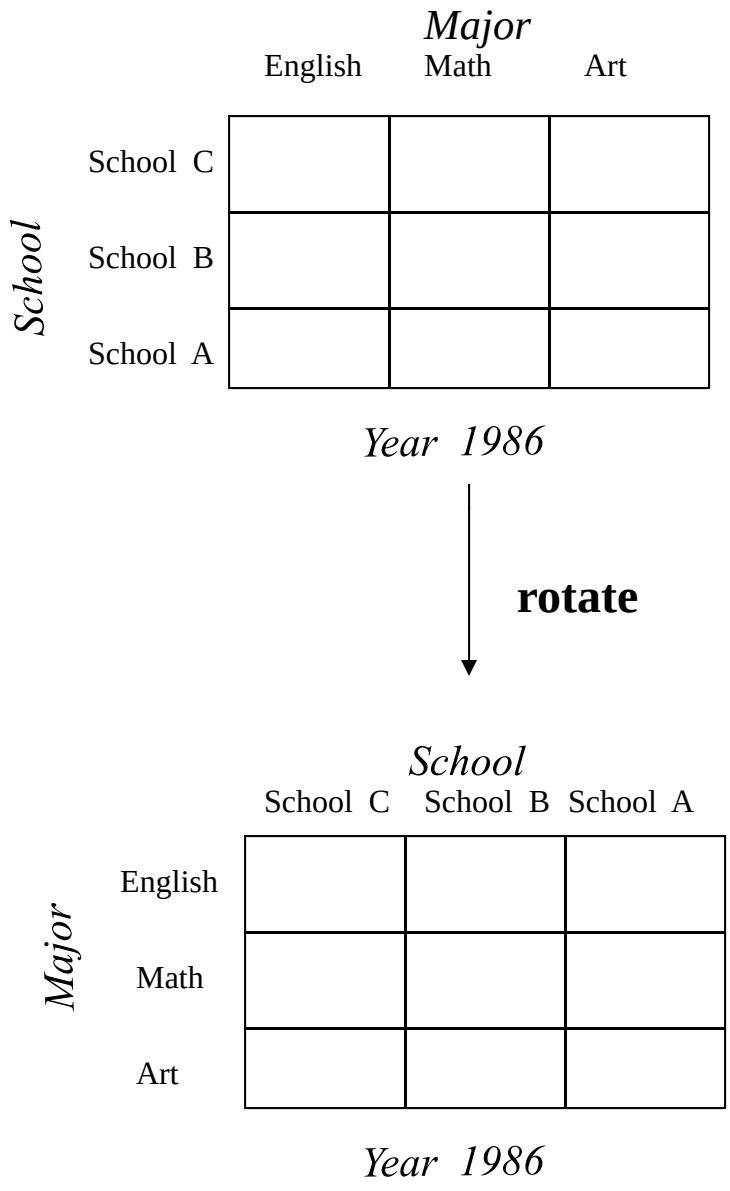
# OLAP Operation

- Slice – performs selection on one dimension of a data cube (slice for *Year* = 1986).


Major
English
Math
Art
School
School A
School B
School C
1999
1998
Year
1980
slice
Major
English
Math
Art
School C
School B
School A
School
Year 1986

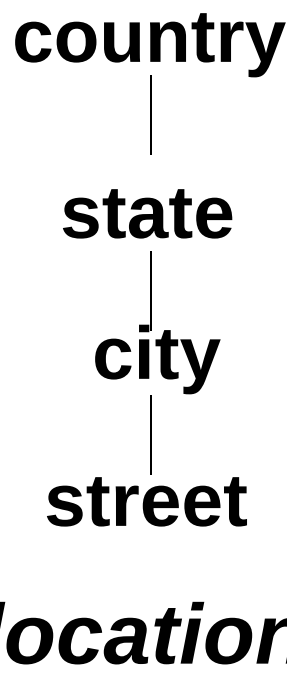
# OLAP Operation

- Rotate – performs rotation on data axes of a data cube.

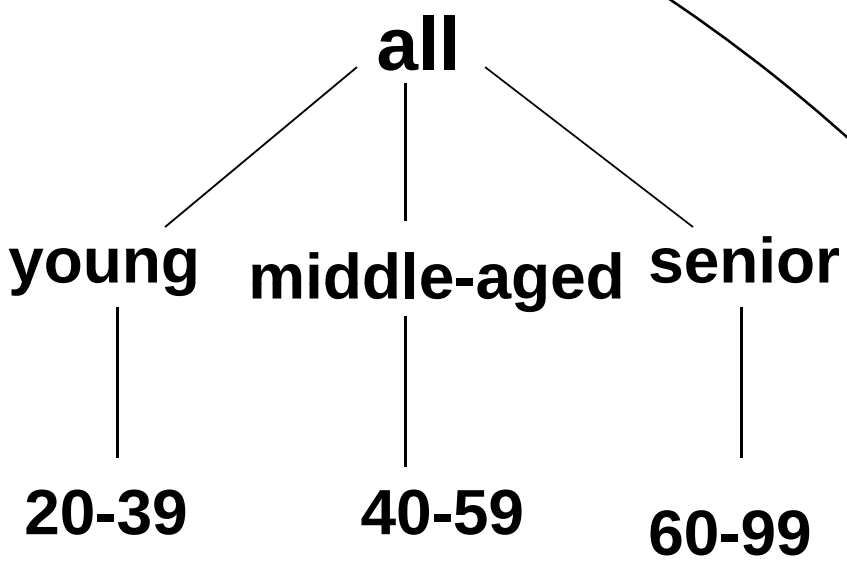

Major
English
Math
Art
School
School C
School B
School A
Year 1986
rotate
School
School C
School B
School A
Major
English
Math
Art
Year 1986

# OLAP Operation

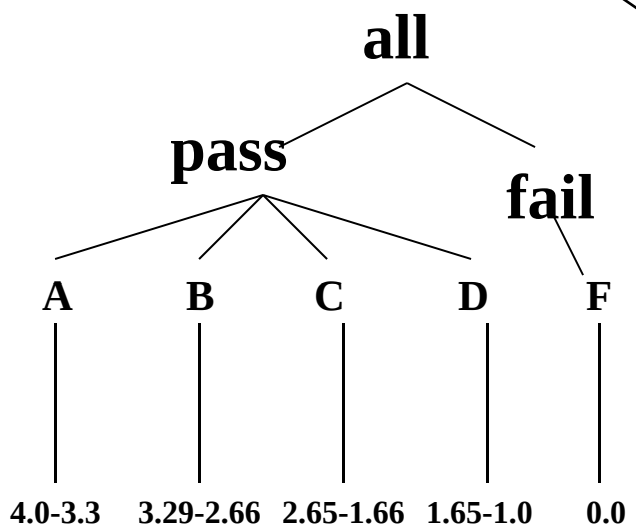
- Roll-up – performs dimension reduction or concept hierarchy ascension on a data cube (roll-up on *Year* from single year to decade).




# Concept hierarchy

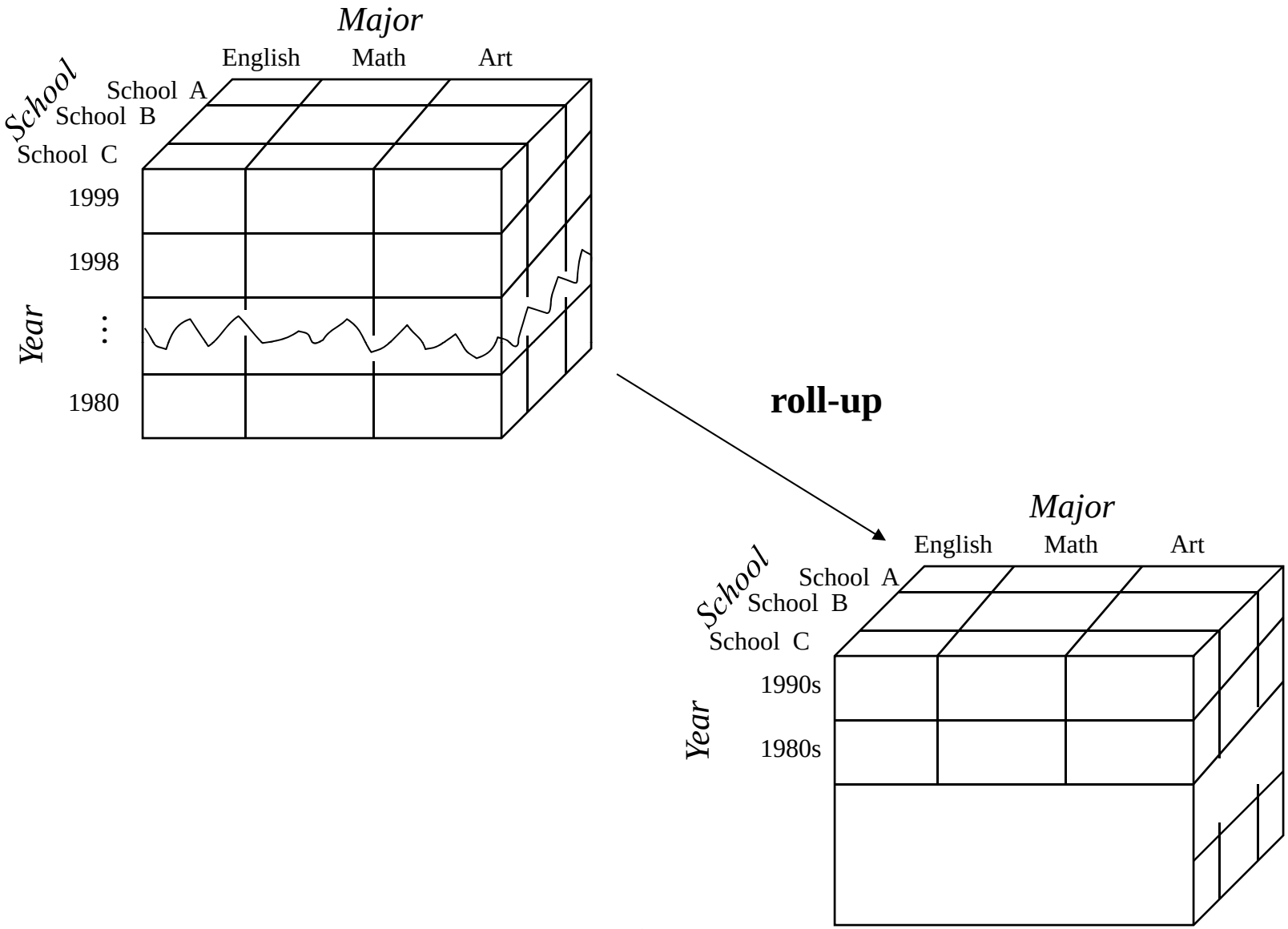



# Concept hierarchy



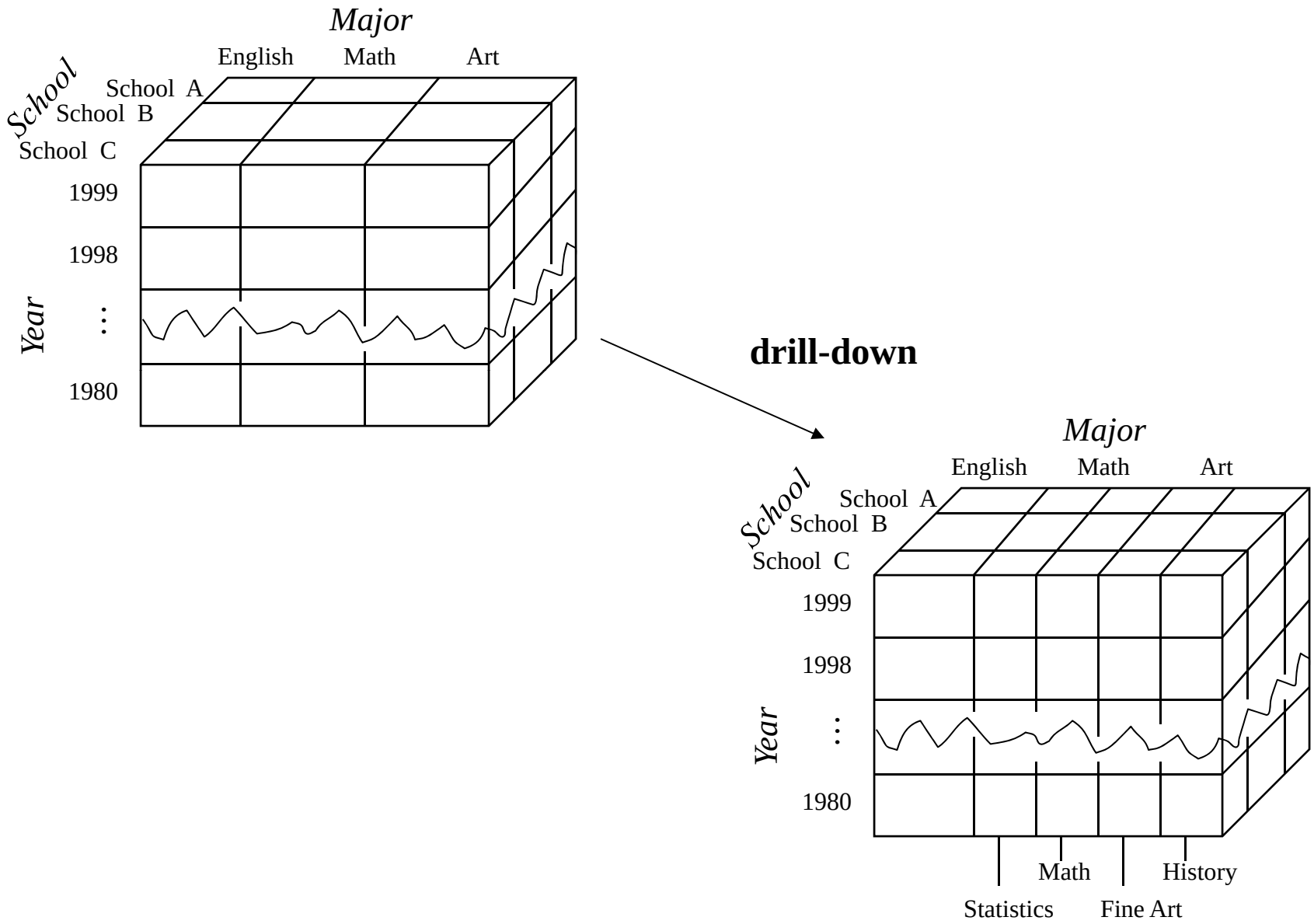

***GPA***

# Concept hierarchy


Major
English
Math
Art
School
School A
School B
School C
1999
1998
Year
1980
roll-up
Major
English
Math
Art
School
School A
School B
School C
1990s
Year
1980s

# OLAP Operation

- Drill-down – performs dimension expansion based on concept hierarchy on a data cube (drill-down on *Major* to more detailed categories).


Major
English
Math
Art
School
School A
School B
School C
1999
1998
Year
1980
drill-down
Major
English
Math
Art
School
School A
School B
School C
1999
1998
Year
1980
Math
History
Statistics
Fine Art

# End of
# Data Warehouse and Mediator Module (Part B)