

Databases: Data Models

Relational model

First	Last	Course	Grade
Hermione	Granger	Potions	A
Draco	Malfoy	Potions	B
Harry	Potter	Potions	A
Ronald	Weasley	Potions	C

Semi-structured model

```
<students>
  <student first="Hermione" last="Granger">
    <course>Potions</course>
    <grade>A</grade>
  </student>
  <student first="Draco" last="Malfoy">
    <course>Potions</course>
    <grade>B</grade>
  </student>
  ... more students here...
</students>
```

Relational model

First	Last	Course	Grade
Hermione	Granger	Potions	A
Draco	Malfoy	Potions	B
Harry	Potter	Potions	A
Ronald	Weasley	Potions	C

Keys of a relation

SID	First	Last
123	Hermione	Granger
111	Draco	Malfoy
234	Harry	Potter
345	Ronald	Weasley

SID	CRN	Grade
123	777	A
111	777	B
234	777	A
345	777	C

CRN	Name	Semester	Year
777	Potions	Fall	1997
888	Potions	Spring	1997
999	Transfiguration	Fall	1996
789	Transfiguration	Spring	1996

Students

SID	First	Last
100	Hermione	Granger
101	Draco	Malfoy
102	Harry	Potter
103	Ronald	Weasley

Grades

SID	CRN	Grade
100	900	A
101	900	B
102	900	A
103	900	C
100	901	A
100	902	B
101	903	F

Classes

CRN	Title	Teacher	Semester	Time
900	Potions	Snape	F97	9am
901	Transfiguration	McGonagall	F97	10am
902	Divination	Firenze	F97	3pm
903	Divination	Trelawney	F97	9am
904	Def Dark Arts	Snape	F99	9am
905	Def Dark Arts	Quirrell	F97	3pm