

schema for *time\_slot* works on all databases, including Oracle. Note that although Oracle supports the **datetime** datatype, **datetime** includes a specific day, month, and year as well as a time, and is not appropriate here since we want only a time. There are two alternatives to splitting the time attributes into an hour and a minute component, but neither is desirable. The first alternative is to use a **varchar** type, but that makes it hard to enforce validity constraints on the string as well as to perform comparison on time. The second alternative is to encode time as an integer representing a number of minutes (or seconds) from midnight, but this alternative requires extra code with each query to covert values between the standard time representation and the integer encoding. We therefore chose the two-part solution.

### A.3 Sample Data

In this section we provide sample data for each of the relations defined in the previous section.

<i>building</i>	<i>room_number</i>	<i>capacity</i>
Packard	101	500
Painter	514	10
Taylor	3128	70
Watson	100	30
Watson	120	50

**Figure A.3** The *classroom* relation.

<i>dept_name</i>	<i>building</i>	<i>budget</i>
Biology	Watson	90000
Comp. Sci.	Taylor	100000
Elec. Eng.	Taylor	85000
Finance	Painter	120000
History	Painter	50000
Music	Packard	80000
Physics	Watson	70000

**Figure A.4** The *department* relation.

<i>course_id</i>	<i>title</i>	<i>dept_name</i>	<i>credits</i>
BIO-101	Intro. to Biology	Biology	4
BIO-301	Genetics	Biology	4
BIO-399	Computational Biology	Biology	3
CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-190	Game Design	Comp. Sci.	4
CS-315	Robotics	Comp. Sci.	3
CS-319	Image Processing	Comp. Sci.	3
CS-347	Database System Concepts	Comp. Sci.	3
EE-181	Intro. to Digital Systems	Elec. Eng.	3
FIN-201	Investment Banking	Finance	3
HIS-351	World History	History	3
MU-199	Music Video Production	Music	3
PHY-101	Physical Principles	Physics	4

**Figure A.5** The *course* relation.

<i>ID</i>	<i>name</i>	<i>dept_name</i>	<i>salary</i>
10101	Srinivasan	Comp. Sci.	65000
12121	Wu	Finance	90000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
32343	El Said	History	60000
33456	Gold	Physics	87000
45565	Katz	Comp. Sci.	75000
58583	Califieri	History	62000
76543	Singh	Finance	80000
76766	Crick	Biology	72000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000

**Figure A.6** The *instructor* relation.

<i>course_id</i>	<i>sec_id</i>	<i>semester</i>	<i>year</i>	<i>building</i>	<i>room_number</i>	<i>time_slot_id</i>
BIO-101	1	Summer	2009	Painter	514	B
BIO-301	1	Summer	2010	Painter	514	A
CS-101	1	Fall	2009	Packard	101	H
CS-101	1	Spring	2010	Packard	101	F
CS-190	1	Spring	2009	Taylor	3128	E
CS-190	2	Spring	2009	Taylor	3128	A
CS-315	1	Spring	2010	Watson	120	D
CS-319	1	Spring	2010	Watson	100	B
CS-319	2	Spring	2010	Taylor	3128	C
CS-347	1	Fall	2009	Taylor	3128	A
EE-181	1	Spring	2009	Taylor	3128	C
FIN-201	1	Spring	2010	Packard	101	B
HIS-351	1	Spring	2010	Painter	514	C
MU-199	1	Spring	2010	Packard	101	D
PHY-101	1	Fall	2009	Watson	100	A

Figure A.7 The *section* relation.

<i>ID</i>	<i>course_id</i>	<i>sec_id</i>	<i>semester</i>	<i>year</i>
10101	CS-101	1	Fall	2009
10101	CS-315	1	Spring	2010
10101	CS-347	1	Fall	2009
12121	FIN-201	1	Spring	2010
15151	MU-199	1	Spring	2010
22222	PHY-101	1	Fall	2009
32343	HIS-351	1	Spring	2010
45565	CS-101	1	Spring	2010
45565	CS-319	1	Spring	2010
76766	BIO-101	1	Summer	2009
76766	BIO-301	1	Summer	2010
83821	CS-190	1	Spring	2009
83821	CS-190	2	Spring	2009
83821	CS-319	2	Spring	2010
98345	EE-181	1	Spring	2009

Figure A.8 The *teaches* relation.

<i>ID</i>	<i>name</i>	<i>dept_name</i>	<i>tot_cred</i>
00128	Zhang	Comp. Sci.	102
12345	Shankar	Comp. Sci.	32
19991	Brandt	History	80
23121	Chavez	Finance	110
44553	Peltier	Physics	56
45678	Levy	Physics	46
54321	Williams	Comp. Sci.	54
55739	Sanchez	Music	38
70557	Snow	Physics	0
76543	Brown	Comp. Sci.	58
76653	Aoi	Elec. Eng.	60
98765	Bourikas	Elec. Eng.	98
98988	Tanaka	Biology	120

Figure A.9 The *student* relation.

<i>ID</i>	<i>course_id</i>	<i>sec_id</i>	<i>semester</i>	<i>year</i>	<i>grade</i>
00128	CS-101	1	Fall	2009	A
00128	CS-347	1	Fall	2009	A-
12345	CS-101	1	Fall	2009	C
12345	CS-190	2	Spring	2009	A
12345	CS-315	1	Spring	2010	A
12345	CS-347	1	Fall	2009	A
19991	HIS-351	1	Spring	2010	B
23121	FIN-201	1	Spring	2010	C+
44553	PHY-101	1	Fall	2009	B-
45678	CS-101	1	Fall	2009	F
45678	CS-101	1	Spring	2010	B+
45678	CS-319	1	Spring	2010	B
54321	CS-101	1	Fall	2009	A-
54321	CS-190	2	Spring	2009	B+
55739	MU-199	1	Spring	2010	A-
76543	CS-101	1	Fall	2009	A
76543	CS-319	2	Spring	2010	A
76653	EE-181	1	Spring	2009	C
98765	CS-101	1	Fall	2009	C-
98765	CS-315	1	Spring	2010	B
98988	BIO-101	1	Summer	2009	A
98988	BIO-301	1	Summer	2010	<i>null</i>

Figure A.10 The *takes* relation.

<i>s_id</i>	<i>i_id</i>
00128	45565
12345	10101
23121	76543
44553	22222
45678	22222
76543	45565
76653	98345
98765	98345
98988	76766

**Figure A.11**    The *advisor* relation.

<i>time_slot_id</i>	<i>day</i>	<i>start_time</i>	<i>end_time</i>
A	M	8:00	8:50
A	W	8:00	8:50
A	F	8:00	8:50
B	M	9:00	9:50
B	W	9:00	9:50
B	F	9:00	9:50
C	M	11:00	11:50
C	W	11:00	11:50
C	F	11:00	11:50
D	M	13:00	13:50
D	W	13:00	13:50
D	F	13:00	13:50
E	T	10:30	11:45
E	R	10:30	11:45
F	T	14:30	15:45
F	R	14:30	15:45
G	M	16:00	16:50
G	W	16:00	16:50
G	F	16:00	16:50
H	W	10:00	12:30

**Figure A.12**    The *time\_slot* relation.

<i>course_id</i>	<i>prereq_id</i>
BIO-301	BIO-101
BIO-399	BIO-101
CS-190	CS-101
CS-315	CS-101
CS-319	CS-101
CS-347	CS-101
EE-181	PHY-101

**Figure A.13** The *prereq* relation.

<i>time_slot_id</i>	<i>day</i>	<i>start_hr</i>	<i>start_min</i>	<i>end_hr</i>	<i>end_min</i>
A	M	8	0	8	50
A	W	8	0	8	50
A	F	8	0	8	50
B	M	9	0	9	50
B	W	9	0	9	50
B	F	9	0	9	50
C	M	11	0	11	50
C	W	11	0	11	50
C	F	11	0	11	50
D	M	13	0	13	50
D	W	13	0	13	50
D	F	13	0	13	50
E	T	10	30	11	45
E	R	10	30	11	45
F	T	14	30	15	45
F	R	14	30	15	45
G	M	16	0	16	50
G	W	16	0	16	50
G	F	16	0	16	50
H	W	10	0	12	30

**Figure A.14** The *time\_slot* relation with start and end time separated into hour and minute.