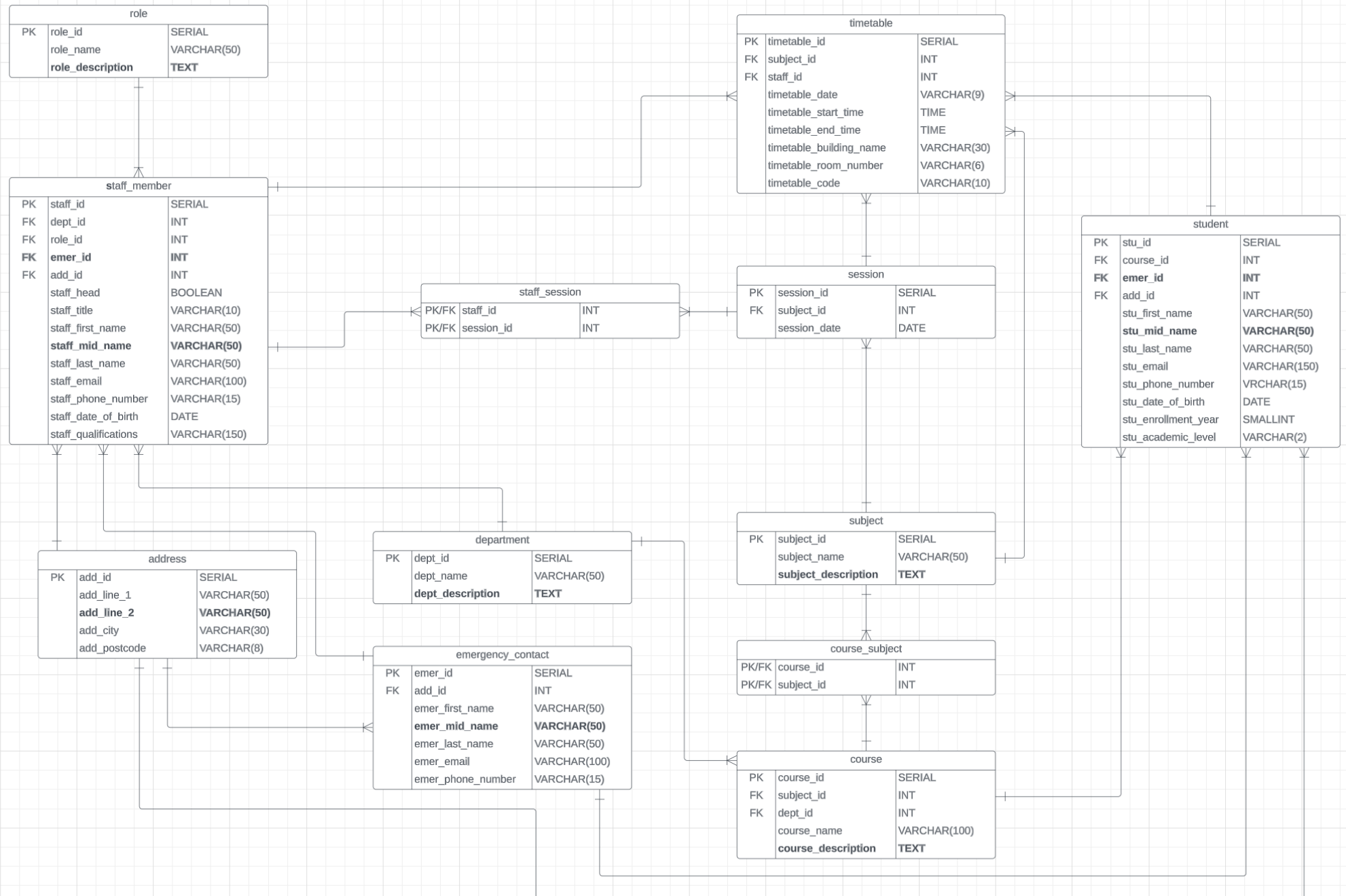


Database Systems Development
M30232

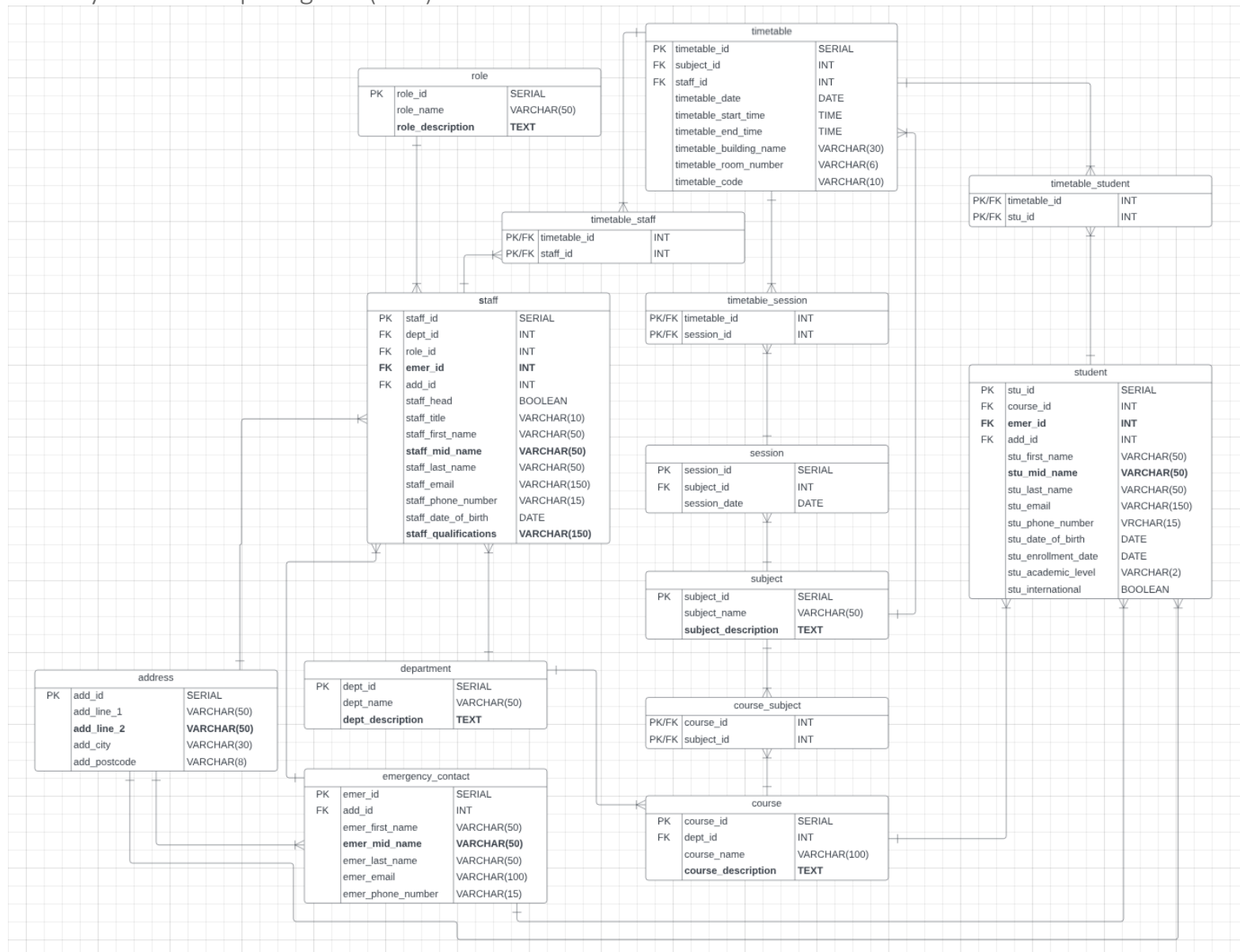
CW2

Group 28

2.1 Previous Entity Relationship Diagram (ERD) – CW1



Improved Entity Relationship Diagram (ERD) – CW



2.2 Reflective Analysis

To begin with, we noticed that our database wasn't fully normalised. To fix this, we added three new intersection tables, all of which link to timetable, these being: timetable_student, timetable_staff, timetable_session.

We spotted two obvious mistakes in the previous ERD: we had a double link between the student and course tables, so one was removed as it was redundant because it didn't need to be there. The second mistake was the relationship between staff and session, as well as the intersection inbetween. There was no need for this relationship as we weren't storing staff_id in the session table, and neither were we storing session_id in the staff table, so it was unnecessary to begin with because we are already storing this information in the timetable table.

We also made a few small changes to data types. Previously, we had the student_enrollment_year attribute set as SMALLINT, which isn't the best way to store this data. To fix this, we changed the name of this attribute to student_enrollment_date, with a data type of DATE. With this change, you can see the full date a student has joined the academic institution.

A few defaults have been added to the timetable table, these being: timetable_start_time and timetable_end_time now defaults to the current time. The default date is also applied to timetable_date. Student_enrollment_date also has this condition so that it correctly, and automatically, records the enrolment date when the student is being added into the system. Staff_head now defaults to false because there's a higher chance of a staff member not being head, compared to them being a head of department.

We've also incorporated a distinction between home and international students into this database. This has been accomplished by adding the stu_international attributed to the student table, which is a boolean check for whether this is an international student or not. This attribute also defaults to FALSE.

One final small change we made was staff_qualifications was changed from NOT NULL to NULL. This is to accommodate some staff members not having any qualifications for entry level jobs, such as entry level administrative staff.

2.3 Data Dictionary

department						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
dept_id	PK		SERIAL			-
dept_name			VARCHAR(50)	NOT NULL		The name of the academic department.
dept_description			TEXT			A description of the department's area of research and study.

role						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
role_id	PK		SERIAL			-
role_name			VARCHAR(50)	NOT NULL		The name of the employable role.
role_description			TEXT			The description of what the role involves.

address						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
add_id	PK		SERIAL			-
add_line_1			VARCHAR(50)	NOT NULL		-
add_line_2			VARHCAR(50)			-

add_city			VARHCAR(30)	NOT NULL		-
add_postcode			VARHCAR(8)	NOT NULL		-

emergency_contact						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
emer_id	PK		SERIAL			-
add_id	FK		INT	NOT NULL	address.addr_id	-
emer_first_name			VARCHAR(50)	NOT NULL		-
emer_mid_name			VARCHAR(50)			-
emer_last_name			VARCHAR(50)	NOT NULL		-
emer_email			VARCHAR(150)	NOT NULL, UNIQUE		-
emer_phone_number			VARCHAR(15)	NOT NULL, UNIQUE		-

staff						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
staff_id	PK		SERIAL			-
dept_id	FK		INT	NOT NULL	department.dept_id	The department the staff member belongs to.
role_id	FK		INT	NOT NULL	role.role_id	The employed role of the staff member.
emer_id	FK		INT		emergency_contact.emer_id	-

add_id	FK		INT	NOT NULL	address.add_id	-
staff_head			BOOLEAN	NOT NULL, DEFAULT FALSE		Whether the staff member is a head of department, or not.
staff_title			VARCHAR(10)	NOT NULL		The honorific prefix of the staff member.
staff_first_name			VARCHAR(50)	NOT NULL		-
staff_mid_name			VARCHAR(50)			-
staff_last_name			VARCHAR(50)	NOT NULL		-
staff_email			VARCHAR(150)	NOT NULL, UNIQUE		The staff member's educational email address.
staff_phone_number			VARCHAR(15)	NOT NULL, UNIQUE		-
staff_date_of_birth			DATE	NOT NULL		-
staff_qualifications			VARCHAR(150)			All the qualifications the staff member holds.

course						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
course_id	PK		SERIAL			-
dept_id	FK		INT	NOT NULL	department.dept_id	-
course_name			VARCHAR(100)	NOT NULL		The name of the course.
course_description			TEXT			The description of what the course aims to teach.

subject						
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<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
subject_id	PK		SERIAL			-
subject_name			VARCHAR(50)	NOT NULL		The name of the module the student is taking/being taught.
subject_description			TEXT			A description of what the subject aims to teach.

course_subject						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
course_id	PK/FK		INT	NOT NULL	course.course_id	-
subject_id	PK/FK		INT	NOT NULL	subject.subject_id	-

session						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
session_id	PK		SERIAL			-
subject_id	FK		INT	NOT NULL	subject.subject_id	-
session_date			DATE	NOT NULL		The date of the teaching session.

student						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
stu_id	PK		SERIAL			-

course_id	FK		INT	NOT NULL	course.course_id	The course the student is enrolled on.
emer_id	FK		INT		emergency_contact .emer_id	-
add_id	FK		INT	NOT NULL	address.add_id	-
stu_first_name			VARCHAR(50)	NOT NULL		-
stu_mid_name			VARCHAR(50)			-
stu_last_name			VARCHAR(50)	NOT NULL		-
stu_email			VARCHAR(150)	NOT NULL; UNIQUE		The student's educational email address.
stu_phone_number			VARCHAR(15)	NOT NULL; UNIQUE		-
stu_date_of_birth			DATE	NOT NULL		-
stu_enrollment_date			DATE	NOT NULL, DEFAULT CURRENT_DATE		The date the student has enrolled on the course.
stu_academic_level			VARCHAR(2)	NOT NULL		The level of the student's study.
stu_international			BOOLEAN	NOT NULL, DEFAULT FALSE		Whether the student is an international student, or not.

timetable						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
timetable_id	PK		SERIAL			-
subject_id	FK		INT	NOT NULL	subject.subject_id	-
staff_id	FK		INT	NOT NULL	staff.staff_id	-

timetable_date			DATE	NOT NULL, DEFAULT CURRENT_DATE		The date of the timetable.
timetable_start_time			TIME	NOT NULL, DEFAULT CURRENT_TIME, CHECK "09:00" <= timetable_start_time <= "17:00"		The start time of the session on the timetable.
timetable_end_time			TIME	NOT NULL, DEFAULT CURRENT_TIME		The end time of the session on the timetable.
timetable_building_name			VARCHAR(30)	NOT NULL		The name of the building holding the session.
timetable_room_number			VARCHAR(6)	NOT NULL		The room number of the session.
timetable_code			VARCHAR(10)	NOT NULL		The group code of the teaching session.

timetable_staff						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
timetable_id	PK/FK		INT	NOT NULL	timetable.timetable_id	-
staff_id	PK/FK		INT	NOT NULL	staff.staff_id	

timetable_session						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
timetable_id	PK/FK		INT	NOT NULL	timetable.timetable_id	-

session_id	PK/FK		INT	NOT NULL	session.session_id	-
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timetable_student						
<i>Attribute_Name</i>	<i>KEY</i>	<i>INDEX</i>	<i>Data Type & Size</i>	<i>Domains & Constraints</i>	<i>FK Reference</i>	<i>Description</i>
timetable_id	PK/FK		INT	NOT NULL	timetable.timetable_id	-
stu_id	PK/FK		INT	NOT NULL	student.stu_id	-