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Database Design Report

Computing For Free

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# Goal

Create a database for recording session attendance of students and booking sessions.

# Version Control

GitHub:

<https://github.com/forestraindrip/BCPR203_Database_Management_Assignment>

# Normalisation

## Column header

Following items are column headers from “Basic fields for engagement spreadsheet.xlsx” provided:

* ID Number
* First Name
* Last Name
* Course
* PROG
* Start Date
* End Date
* Number of days attended
* Number of days
* Withdrawal point
* Last Withdrawal Date
* Attended past last withdrawal date?
* Date Last Attended
* Last Active Moodle
* Future Bookings
* Weeks Left
* Completed
* Notes
* Monday, 8 January 2018 (attendance date and time)

## Pre-normalisation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ID Number | First Name | Last Name | Course | PROG | Start Date | End Date | Completed |

Following column headers are removed because they are derived attributes or data from external sources:

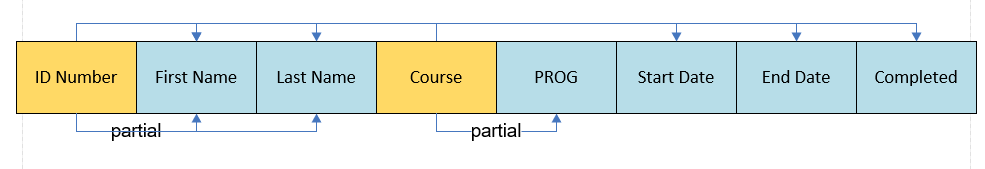
* Number of days
* Number of days attended
* Withdrawal point
* Last Withdrawal Date
* Attended past last withdrawal date?
* Date Last Attended
* Last Active Moodle
* Future Bookings
* Weeks Left

“Completed” is kept, although it can be calculated by other attributes. However, there may be special cases that enrolment need to be manual examined and modified by the staffs.

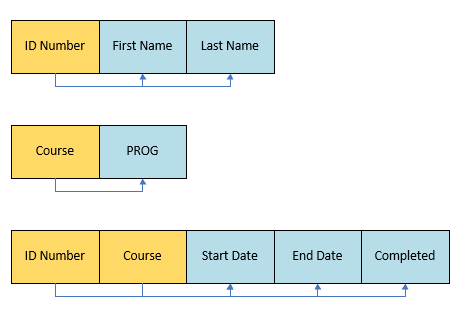
“Notes” is removed because it is not directly related to the booking and attendance system.

“Attendance date and time” is removed and put into a new table Attendance because it has multiple values.

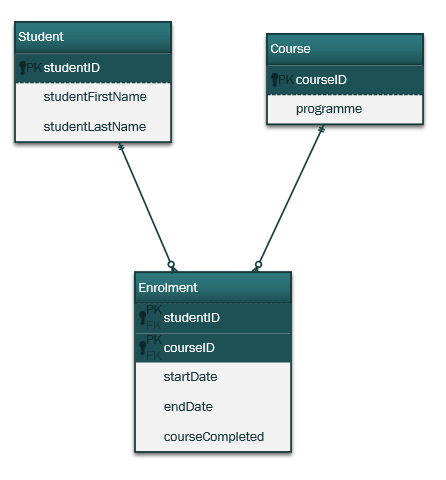
## First normal form



## Second normal form



## Entity Relationship Diagram



# Choice of entities

Entities are extracted from the nouns in the instruction and business rule.

# Choice of attributes

Attributes are extracted from the nouns in the instruction and business rule. Then I remove attributes which can be calculated, retrieved from external sources or unrelated to the database, such as number of days attended, withdrawal point and staff.

# Choice of keys

* Branch, Programme, Course and Student use existed ID in the current CFF system.
* Sessions, Enrolment, Booking and Attendance use generated ID because they do not have unique key in the existed CFF system.

# Choice of relationships

* Each branch has multiple sessions and each session can only belong to one branch.
* Each student can have several enrolment for different courses and each course can have several students enrolled. Therefore, Student and Course need a bridging table, Enrolment, to connect them.
* Each enrolment can have multiple booking and attendance record.
* Each session can have several attendances and bookings.
* Each booking and attendance can only belong to one session.
* A course can only belong to one programme, but a programme can have several courses.

# Decision issues

## Separateness of Attendance and Booking

In the first design, Booking entity records the time a student attending the booking session. If there is no attendance time record, then we can know the student is absent from the booking session, so no Attendance entity existed. However, because student can attend a session without booking, Attendance entity becomes necessary to record the attendance date and time without referring to a Booking entity.

## Using enrolment ID in Enrolment instead of using student ID and course ID

In the final stage of normalisation in previous session, it uses student ID and course ID as composite primary key. However, a student may fail a course and enrol the same course again. If student ID and course ID is the composite primary key, both old and new enrolments will have the same primary key which creates duplicate data. Therefore, I use enrolment ID to prevent duplicate primary key for enrolment.

## Using enrolment ID and session ID as composite primary key in Attendance instead of in Booking

Both Booking entity and Attendance can use enrolment ID and session ID as composite primary. However, two entities use the same composite primary key may cause confusion for the users. On the other hand, the importance of Attendance is higher than Booking, using enrolment ID and session ID as composite primary key for Attendance is more convenient for the users to input data than using random ID. Therefore, I use random number as primary key for Booking and composite primary key for Attendance.