# Assignment Group Information:

Our group has 3 members. Members’ names and email address are listed below:

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We have chosen Scenario 3 Dead Prime Minister High School as Assignment 1 topic.

# Part 1 – List of entities with descriptions

List of entities and Descriptions:

* STUDENT entity is to store student information and has a unique key to identify each student.
  + **STUDENT** -> Name, Address, BirthDate, Gender, Guardians, DateEnroll, DateUnenroll
* LEGAL\_GUARDIAN entity is to store students’ guardian data, probably for emergency contact usage.
  + **GUARDIAN** -> Name, Address, BirthDate, Gender, Children, HomePhone
* ENROLLMENT entity is to store data of enrolled students’ academic results in corresponding academic years, responsible homeroom teachers’ homeroom information.
  + **ENROLLMENT** -> AcademicYear, HomeroomTeacher, HomeroomLocation, CourseEnroll, CourseLocation, Grade, SemGPA, YearGPA, OverallGPA
* DISCIPLINARY ACTIONS entity is to store data of if any disciplinary actions taken students.
  + **DISCIPLINARY ACTION** -> StudentName, IncidentDate, IncidentType, ActionsTaken
* TEST entity is to store students’ standardized test results in different Grades.
  + **TEST** -> StudentName, TestDate, TestName, TestResult
* CLUB entity is to store data for students’ extracurricular activities information.
  + **CLUB** -> StudentName, AcademicYear, ClubName, PositionHeld
* HIGH SCHOOL EDUCATION PLAN entity is to store post high school plans and courses applied from students.
  + **HIGH SCHOOL EDUCATION PLAN** -> PostsecondaryEducationApplyto, ApplicationDate, ApplicationResult, PostsecondaryEducationChosen

# Part 2 – Business rules correspond to entities listed in Part 1

**STUDENT**:

Each student may have more than one legal guardian. (Mandatory 1 -to- Mandatory Many)

Each student may have more than one post high school education plan. (Mandatory 1 -to- Mandatory Many)

Each student must have one enrollment record in high school. (Mandatory 1 -to- Mandatory 1)

Each student will have period GPA, yearly GPA, and overall GPA for their courses mix. (Mandatory 1 -to- Mandatory Many)

Each student must attend standardized tests. (Mandatory 1 -to- Mandatory Many)

Each student may have 0 or many disciplinary actions records. (Optional 1 -to- Optional Many)

**GUARDIAN:**

Each legal guardian is responsible for one student. (Mandatory 1 -to- Mandatory 1)

**ENROLLMENTS:**

A student can enroll in many courses. A course can have many students. (Mandatory Many -to- Mandatory Many)

Each enrollment must have a homeroom teacher and a homeroom location (Mandatory 1 -to- Mandatory 1)

Enrollment records contain courses in corresponding academic year, GPA for each grading period, GPA for each academic year, and overall GPA for each student.

**DISCIPLINARY ACTION:**

Each disciplinary action type can apply to different students. (Optional 1 -to- Optional Many)

**TEST:**

Each student must take standardized math and literacy tests written in Grades 3, 6, 9 and 10. Each test will have its own id but not student dependent. Each student will have 4 test id for his own during high school education. (Mandatory Many -to- Mandatory many). Students in Ontario must take the EQAO test. [1]

**CLUB:**

A student must have at least 1 extracurricular activity throughout the enrolled academic years. A club can have many students participated in. (Mandatory Many -to- Mandatory Many)

Each participating student will have his own position in extracurricular activity and will be stored in school database.

Club needs to store its active academic years. Sometimes club will be temporary closed because of not enough participants.

**HIGH SCHOOL EDUCATION PLAN:**

Each student must have at least 1 plan. Student can have many programs applied to, including directly go for employment after high school graduation. (Mandatory 1 -to- Mandatory Many)

Each student can have only one final post high school plan result. (Mandatory 1 -to- Mandatory 1)

# Part 3 – List of unknown(s)

**STUDENT:**

Student numbers are needed as a unique id for searching individual student records. Shall the enrollment details be separated from Student entity? Are the attributes partial functional dependent on different primary keys?

**GUARDIAN:**

Each guardian will be assigned a unique guardian id as their identifier instead of using names to avoid any duplication.

**ENROLLMENT:**

Each course has its own course id. Shall the course info, homeroom info, and GPA results be separated from Enrollment entity? Are the attributes under transitive dependency?

**DISCIPLINARY ACTION:**

Each type of disciplinary action must have its own id. Shall the database include detail description on actions taken on students?

**TEST:**

Each test in different Grades must have a unique test id to identify each test.

**CLUB:**

Each extracurricular activity club must have a unique id for indication. Will each club have different position names?

**POST HIGH SCHOOL PLANS:**

Each plan will have own id. The final plan result can have Others for students who do not receive offer from any institute and have not got other plans.

# Part 4 – List of assumptions (related to physical diagrams towards 3NF stage)

Assume all surrogate key under each table is store in integer. First digit is to clarify which table they are in, e.g. 1 is for STUDENT table’s data, 2 is for LEGAL GUARDIAN table’s data and so on. The following digits are the sequential numbers generate from DBMS.

STUDENT table only consists of fields related to individual students. Student id will be assigned as unique id (surrogate key) for each student. Name, Address, BirthDate, and Gender remain in the table. Guardians, DateEnroll, and DateUnenroll will be assigned to other tables. Enrollment id is a foreign key (not null) to call unique student enrollment record from ENROLLMENT table.

GUARDIAN table consists of guardian’s information only. Each guardian will be assigned a unique guardian id (surrogate key). An associate table between GUARDIAN table and STUDENT table is to identify unique student’s guardian to mitigate the N:M relationship between them.

DISCIPLINARY ACTION table stores type of accidents information. This table consists of an incident id (surrogate key) for every incident type as primary key. An associate table is in between DISCIPLINARY ACTION table and STUDENT table to identify type of disciplinary actions and unique disciplinary actions records taken on corresponding students.

TEST table consists of individual standardized test records for each student. Each test id refers to one single standardized test in specific Grade. This table combines test id (surrogate key) and student id (foreign key – not null) as primary key to indicate individual test records under corresponding student.

ENROLLMENT entity will be split into several tables: 1) ENROLLMENT, 2) COURSE, 3) HOMEROOM, 4) PERIOD GPA, 5) YEAR GPA, and 6) OVERALL GPA. Each table contains a unique id as the primary key.

1. ENROLLMENT table consists of Date Enrolled, Date Unenrolled, and Academic Year records. Each Enrollment id represents record for each student’s enrollment in specific academic year, with his own date enrolled and date unenrolled. Assume Date Enrolled, Date Unenrolled, and Academic Year records fields are manually input by users as initial data records. All these three fields are related to Enrollment id only.
2. COURSE table consists of Course id and Course Location. Enrollment id is added as foreign key and combine with Course id to have unique record to store what courses are under every enrollment records.  
   There will be an associate table between COURSE table and STUDENT table to identify unique records for students enrolled in which courses and relevant course grades.   
   Assume course info can only be remained the same or added, no deletion is allowed to store different courses info throughout different academic years.   
   COURSE table is the parent table for PERIOD GPA table, YEAR GPA table, and OVERALL GPA table but not in identifying relationship. This means courses data will indirectly affect GPA data, i.e. student enrolled in different courses mix will result in different GPA mix.
3. HOMEROOM table consists of Homeroom id, Homeroom teacher, and Homeroom location. It takes Enrollment id as foreign key and combine with Homeroom id as unique primary key under HOMEROOM table. So, each student with a specific enrollment record will have his unique homeroom information.
4. PERIOD GPA table stores students’ period GPA results. It has its own surrogate id to identify each single record. All results are manually input by users. It depends on each student enrollment courses mix.
5. YEAR GPA table stores students’ yearly GPA results. It has its own surrogate id to identify each single record. All results are manually input by users. It depends on each student enrollment courses mix.
6. OVERALL GPA table stores students’ overall GPA results. It has its own surrogate id to identify each single record. All results are manually input by users. It depends on each student enrollment courses mix.

CLUB only consists of a unique Club id, Club name, and active academic years. There will be an associate table between STUDENT table and CLUB table for unique student records on extracurricular activities and corresponding club positions.

POST HIGH SCHOOL PLANS table will only consist of individual student applications with application results. Student’s final post high school plans will be stored in the associate table between the STUDENT table and POST HIGH SCHOOL PLANS table.

# Part 5 – Diagrams

1. Conceptual

Diagram

Description automatically generated

File name: Lab\_Assignment1\_Conceptual\_Diagram.png

1. Physical

Diagram

Description automatically generated

File name: Lab\_Assignment1\_Physical\_Diagram.png

# Part 6 – Actual database from MySQL

Please refer to sql file Lab1\_Assignment1\_Physical\_Diagram.txt for references.

# References:

[1] CBC. “Experts weigh in on pros and cons of EQAO tests as students resume assessments.” [Online]. https://www.cbc.ca/news/canada/kitchener-waterloo/eqao-standardize-testing-pros-and-cons-1.6483138 [accessed: Oct 6, 2022].