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DBD 281: PROJECT

Contents

[Introduction and Background 3](#_Toc131798993)

[ERD 4](#_Toc131798994)

[Tables 6](#_Toc131798995)

[Table: Account 6](#_Toc131798996)

[LINKS TO 6](#_Toc131798997)

[LINKS FROM 6](#_Toc131798998)

[Table: Classroom 6](#_Toc131798999)

[LINKS TO 6](#_Toc131799000)

[LINKS FROM 6](#_Toc131799001)

[Table: DaysAbsent 6](#_Toc131799002)

[LINKS TO 6](#_Toc131799003)

[LINKS FROM 6](#_Toc131799004)

[Table: Department 6](#_Toc131799005)

[LINKS TO 7](#_Toc131799006)

[LINKS FROM 7](#_Toc131799007)

[Table: Disciplinary Record 7](#_Toc131799008)

[LINKS TO 7](#_Toc131799009)

[LINKS FROM 7](#_Toc131799010)

[Table: Employees 7](#_Toc131799011)

[LINKS TO 7](#_Toc131799012)

[LINKED FROM 7](#_Toc131799013)

[Table: EmployeeMed 8](#_Toc131799014)

[LINKS TO 8](#_Toc131799015)

[LINKS FROM 8](#_Toc131799016)

[Tables: EmployeeQualifications 8](#_Toc131799017)

[LINKS TO 8](#_Toc131799018)

[LINKS FROM 8](#_Toc131799019)

[Tables: ExtraCurricular 8](#_Toc131799020)

[LINKS TO 8](#_Toc131799021)

[LINKS FROM 8](#_Toc131799022)

[Tables: Grades 8](#_Toc131799023)

[LINKS TO 9](#_Toc131799024)

[LINKS FROM 9](#_Toc131799025)

[Tables: GuardiansDetails 9](#_Toc131799026)

[LINKS TO 9](#_Toc131799027)

[LINKS FROM 9](#_Toc131799028)

[Tables: JobPosition 9](#_Toc131799029)

[LINKS TO 9](#_Toc131799030)

[LINKS FROM 9](#_Toc131799031)

[Tables: Qualifications 9](#_Toc131799032)

[LINKS TO 10](#_Toc131799033)

[LINKS FROM 10](#_Toc131799034)

[Tables: StudentCurriculum 10](#_Toc131799035)

[LINKS TO 10](#_Toc131799036)

[LINKS FROM 10](#_Toc131799037)

[Tables: StudentDaysAbsent 10](#_Toc131799038)

[LINKS TO 10](#_Toc131799039)

[LINKS FROM 10](#_Toc131799040)

[Tables: StudentDiscipline 10](#_Toc131799041)

[LINKS TO 10](#_Toc131799042)

[LINKS FROM 10](#_Toc131799043)

[Tables: StudentGuardians 10](#_Toc131799044)

[LINKS TO 11](#_Toc131799045)

[LINKS FROM 11](#_Toc131799046)

[Tables: StudentMed 11](#_Toc131799047)

[LINKS TO 11](#_Toc131799048)

[LINKS FROM 11](#_Toc131799049)

[Tables: Students 11](#_Toc131799050)

[LINKS TO 11](#_Toc131799051)

[LINKS FROM 11](#_Toc131799052)

[Table: StudentSubject 12](#_Toc131799053)

[LINKS TO 12](#_Toc131799054)

[LINKS FROM 12](#_Toc131799055)

[Table: Subject 12](#_Toc131799056)

[LINKS TO 12](#_Toc131799057)

[LINKS FROM 12](#_Toc131799058)

[Table: TeacherSubject 12](#_Toc131799059)

[LINKS TO 12](#_Toc131799060)

[LINKS FROM 12](#_Toc131799061)

[Tables: TransactionHistory 12](#_Toc131799062)

[LINKS TO 13](#_Toc131799063)

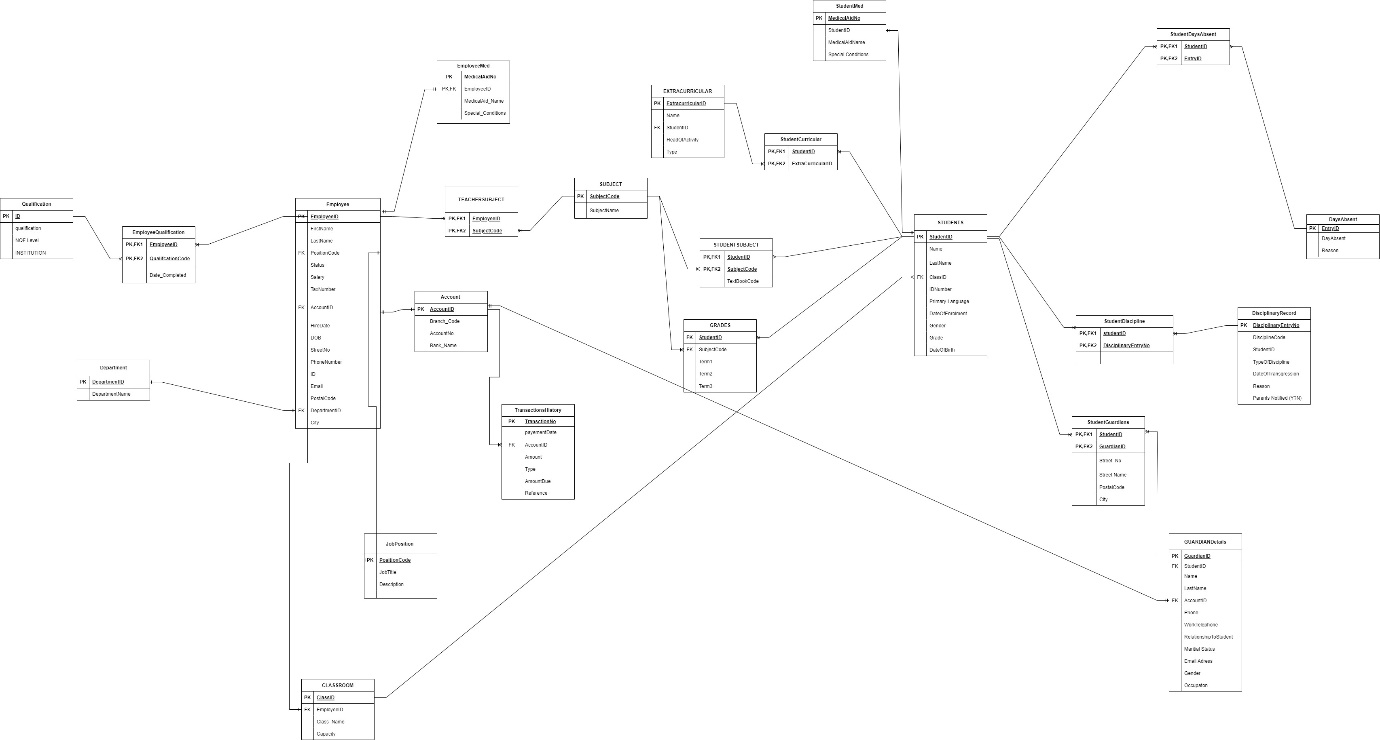
[LINKS FROM 13](#_Toc131799064)

# Introduction and Background

Laerskool Theresapark is one of the top-rated primary schools in Akasia. It is a multi-racial school   accommodating nearly 1000 learners who are being provided with quality education daily. Theresapark’s primary focus is to offer high quality within disciplined, learner friendly atmosphere, where every learner can achieve success. Founded in the year 1987, Theresapark has strived not only to help the learners grow with their academic work but to grow through the school’s religion of Christianity. As depicted from the school logo, the golden vein represent rich harvest as learners are to leave this school fulfilled with the competent knowledge and skills to be ready to forge a brighter future for themselves as they will later embark onto the next chapter of their lives through their academics and out. Theresapark is represented by the colours light blue, dark blue and yellow. Like any other school they have extracurricular activities to such as soccer, rugby, netball tennis to reduce stress and improve the learner’s mood because they believe that happy learners equal to higher grades. After consideration of the school’s database, we approached Laerskool Theresapark with a proposal to design a database to help them keep all the records of the students and all the workers of the school. The database will help them keep the data of the school organized and will be more efficient and user friendly.

# ERD

The following image below illustrates the normalisation at the third normal form(3NF)



This following image below illustrates the normalisation of the ERD at the second normal form (2NF)

Graphical user interface, application

Description automatically generated

List Questions or queries the database can answer.

1. The database can help keep track of how many students there are per grade.
2. What are the Final year marks or each student and who are in the top 3 or top 5?
3. The database can also make it easy to keep track of Textbooks and their respective Subjects.
4. The database can also keep account of the students fees .
5. The database can also make it easy for the administration team to view multiple data at the same time because of the links of the database.

# Tables

## **Table: Account**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **DESCRIPTION** |
| PK | AccountID | INT |  |  |
|  | BranchCode | INT |  |  |
|  | AccountNo | INT |  |  |
|  | BankName | VARCHAR(50) | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
|  | Transaction History  Guardian details  Employee |

## **Table: Classroom**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | ClassID | VARCHAR(50) |  |  |
|  | EmployeeID | INT | N |  |
|  | Name | VARCHAR(20) | N |  |
|  | Capacity | INT | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Employee | Students |

## **Table: DaysAbsent**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | EntryID | INT |  |  |
|  | DaysAbsent | DATETIME | N |  |
|  | Reason | VARCHAR(30) | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
|  | StudentDaysAbsent |

## **Table: Department**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | DepartmentID | INT |  |  |
|  | DepartmentName | VARCHAR(50) |  |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
|  | Employees |

## **Table: Disciplinary Record**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | DisciplinaryEntryNo | INT |  |  |
| FK | StudentID | INT | N |  |
|  | TypeOfDiscipline | VARCHAR(40) | N |  |
|  | DateOfTransgression | DATETIME | N |  |
|  | ParentsNotified | VARCHAR(10) | N |  |
|  | Reason | VARCHAR(255) |  |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Students | StudentDiscipline |

## **Table: Employees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | EmployeeID | INT |  |  |
|  | FirstName | VARCHAR(30) |  |  |
|  | LastName | VARCHAR(30) |  |  |
|  | ID | VARCHAR(13) |  |  |
|  | DOB | DATETIME |  |  |
|  | StreetNo | Varchar(max) | N |  |
|  | PostalCode | Varchar(255) | N |  |
|  | city | Varchar(max) | N |  |
|  | Phone | Varchar(255) | N |  |
|  | Email | VARCHAR(255) | N |  |
| FK | PositionCode | VARCHAR(50) | N |  |
|  | Status | VARCHAR(10) | N |  |
|  | SALARY | MONEY | N |  |
|  | TaxNumber | VARCHAR(10) |  |  |
| FK | AccountID | INT | N |  |
|  | HireDate | DATETIME | N |  |
| FK | DepartmentID | INT | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKED FROM |
| JobPosition | Classroom  TeacherSubject  EmployeeMed  EmployeeQualification |

## **Table: EmployeeMed**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | MedicalAidNumber | VARCHAR(9) |  |  |
| PK/FK | EmployeeID | INT |  |  |
|  | ProviderName | VARCHAR(10) | N |  |
|  | Special\_Conditions | VARCHAR(50) | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Employee |  |

## **Tables: EmployeeQualifications**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK/FK | EmployeeID | INT |  |  |
| PK/FK | QualificationID | INT |  |  |
|  | Date\_completed | DATETIME | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Employee |  |

## **Tables: ExtraCurricular**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | ExtraCurricularID | INT |  |  |
|  | Name | VARCHAR(50) |  |  |
|  | HeadOFActivity | VARCHAR(30) |  |  |
|  | Type | VARCHAR(10) | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
|  | StudentCurricular |

## **Tables: Grades**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| FK | StudentID |  |  |  |
| FK | SubjectCode | VARCHAR(30) | N |  |
|  | Term1 | INT | N |  |
|  | Term2 | INT | N |  |
|  | Term3 | INT | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Subjects  Students |  |

## **Tables: GuardiansDetails**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | GuardianID | INT |  |  |
| FK | StudentID | INT | N |  |
|  | Name | VARCHAR(50) |  |  |
|  | LastName | VARCHAR(50) |  |  |
| FK | AccountID | INT | N |  |
|  | Phone | VARCHAR(10) |  |  |
|  | WorkTelephone | VARCHAR(10) | N |  |
|  | Relationship | VARCHAR(30) |  |  |
|  | MaritalStatus | VARCHAR(30) | N |  |
|  | EmailAddress | VARCHAR(20) | N |  |
|  | Gender | VARCHAR(10) |  |  |
|  | Occupation | VARCHAR(50) | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Accounts  Students | StudentGuardian |

## **Tables: JobPosition**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | PositionCode | VARCHAR(50) |  |  |
|  | JobTitle | VARCHAR(30) |  |  |
|  | Description | VARCHAR(max) | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
|  | Employee |

## **Tables: Qualifications**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | ID | INT |  |  |
|  | Qualification | VARCHAR(max) | N |  |
|  | NQF\_Level | INT | N |  |
|  | Institution | VARCHAR(255) | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
|  | EmployeeQualifications |

## **Tables: StudentCurriculum**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK/FK | ExtraCurricularID | INT |  |  |
| PK/FK | StudentID | INT |  |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| ExtraCurricular  Students |  |

## **Tables: StudentDaysAbsent**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK/FK | StudentID | INT |  |  |
| PK/FK | EntryID | INT |  |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| DaysAbsent  Students |  |

## **Tables: StudentDiscipline**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK/FK | StudentID | INT |  |  |
| PK/FK | DisciplinaryEntryNo | INT |  |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| DisciplinaryRecord  Students |  |

## **Tables: StudentGuardians**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK/FK | StudentID | INT |  |  |
| PK/FK | GuardianID | INT |  |  |
|  | StreetNo | INT | N |  |
|  | StreetName | VARCHAR(40) | N |  |
|  | PostalCode | INT | N |  |
|  | City | VARCHAR(40) | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| GuardianDetails  Students |  |

## **Tables: StudentMed**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | MedicalAidNo | INT |  |  |
| FK | StudentID | INT | N |  |
|  | MedicalAidName | VARCHAR(40) |  |  |
|  | Special\_Condition | VARCHAR(40) | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Students |  |

## **Tables: Students**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | StudentID | INT |  |  |
|  | FirstName | VARCHAR(50) |  |  |
|  | LastName | VARCHAR(50) |  |  |
| FK | ClassID | VARCHAR(50) |  |  |
|  | PrimaryLanguage | VARCHAR(50) | N |  |
|  | DateOfEnrollment | DATETIME |  |  |
|  | Gender | VARCHAR(10) |  |  |
|  | Grade | VARCHAR(10) |  |  |
|  | DOB | DATETIME |  |  |
|  | IDNumber | BIGINT |  |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Classroom | StudentMed  Grades  StudentSubject  StudentGuardians  GuardianDetails  DisciplinaryRecord  StudentDiscipline  StudentCurriculum  StudentDaysAbsent |

## **Table: StudentSubject**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK/FK | StudentID | INT |  |  |
| PK/FK | SubjectCode | VARCHAR(30) |  |  |
|  | TextBookCode | INT | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Subjects | Students |

## **Table: Subject**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | SubjectCode | VARCHAR(30) |  |  |
|  | SubjectName | VARCHAR(50) |  |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Students | StudentSubject  Grades |

## **Table: TeacherSubject**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK/FK | EmployeeID | INT |  |  |
| PK/FK | SubjectCode | VARCHAR(30) |  |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Employee |  |

## **Tables: TransactionHistory**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NAME** | **DATA TYPE** | **NULL/NOT NULL** | **EXTRA INFORMATION** |
| PK | TransactionNo | INT |  |  |
|  | PaymentDate | DATETIME | N |  |
|  | Amount | MONEY | N |  |
|  | Type | VARCHAR(max) | N |  |
|  | AmountDue | MONEY | N |  |
|  | Reference | VARCHAR(50) | N |  |
| FK | AccountID | INT | N |  |

|  |  |
| --- | --- |
| LINKS TO | LINKS FROM |
| Accounts |  |

# STORED PROCEDURES

1. The first procedure we created was to print out marks for each student to see how each student is performing in a particular subject. This procedure is used to print out reports as it tells the person responsible for printing the reports how each learner performed in a particular subject.
2. The second procedure is used to see the top 3 subjects with the highest average as teachers would use this to see how they can get the other subjects to perform at that same level.
3. The third procedure is used for events like price giving as it shows the top 5 performing d for events like price giving as it shows the top 5 performing students in each subject.

## **Dbo.p\_TopStudentsPerSubject**

* Stored procedure with a query to return top 5 students in each subject

### Input/output

|  |  |  |
| --- | --- | --- |
| **Name** | **Data type** | **Information** |
| @subject | VARCHAR(30) | Enter on of the many subjects offered to the students |

## **Dbo.RepsForStuds**

* Stored procedure to display each students term mark for each subject in the form of a report

### Input/output

* (All inputs are from the cursor)

|  |  |  |
| --- | --- | --- |
| **Name** | **Data type** | **Information** |
| @StID | INT |  |
| @FirstName | VARCHAR(50) |  |
| @LastName | VARCHAR(50) |  |
| @SubC | VARCHAR(50) | Subject code for the subjects who’s marks will be shown |
| @T1 | INT | Term 1 mark |
| @T2 | INT | Term 2 mark |
| @T3 | INT | Term 3 mark |

## STORED PROCEDURES

1. The first procedure we created was to print out marks for each student to see how each student is performing in a particular subject. This procedure is used to print out reports as it tells the person responsible for printing the reports how each learner performed in a particular subject.
2. The second procedure is used to see the top 3 subjects with the highest average as teachers would use this to see how they can get the other subjects to perform at that same level.
3. The third procedure is used for events like price giving as it shows the top 5 performing students in each subject.
4. Procedure sp\_SearchStudentEmergencyDetails allows faster access to student's emergency details in case of emergencies.
5. Procedure sp\_StudentCurrentAverage  use the getStudent\_Average function to display the current averages for all the students according to each subject that they take.

## VIEWS

1. vw\_StudentExtraCurricular , this view shows the names of all the students that partake in extracurricualr activities in the senior phase.
2. VwStudentDetails , this view gives a summary of Students subjects grade and teachers that teach the students subjects.
3. vw\_TeacherSubject, this view is used to see which employees are teachers and what subjects they teach.

## TRIGGERS

1. The first trigger that we created enables the Administrator to insert and update the student’s table. Its main purpose is to keep the data of each student up to date and if there is a new student in the school, he/she can be added to the database.
2. The second trigger we created is for updating the teachers’ salaries as they get a certain percentage raise at the end of the year.

## Functions

1. The DBO. getStudent\_Average() function allows user to find the yearly Current average For of a student.
2. The getStudentAge Function calculates the age of a specific Student according to the studentID.