A5 Student Database Option Winter 2021

Use the **Students.accdb** database that is provided in the A5 Dropbox. **Make sure you follow all the instructions on the main A5 assignment description. Explore the database diagram carefully to know what fields the database contains.**

Scenario

You have been hired by a local school to make changes to their student database system. The basic database model has been provided as an Access database. You have been asked to write an Excel application which uses a graphical interface as well as the features of Excel for charting and analysis of grades and student achievement.

Watch this video to see how the basic database works: Video: Use the Desktop Student Database Template

The database you are using for this assignment has had some modifications made to it. If you have a Windows computer, you may be able to open the database in Microsoft Access. Mac computers have no way to open Access database files. ~~As an alternative, you should be able to open the file in any computer lab on campus.~~ You may not be able to open the file using the Remote Virtual Desktop provided by ITS but being able to open the database is not required.

For this assignment and all other database work, you do not have to be able to open the database file. You simply need to have the database file in the same folder as your Excel file (to make things easier) and Excel can read the database file with SQL.

If you can open the file, you will be able to explore tables, queries, forms, and reports in Access in more detail. This would be for you to learn more and is not required for the course but, it may help you understand the assignment.

~~**Microsoft Access 2016** is available to use in the library as well as the computer labs on campus.~~

(DON'T GO ON CAMPUS TO USE COMPUTERS DUE TO COVID-19!)

Learning Outcomes

To complete this project, you will need to:

- **Query** an Access database from Excel using SQL
- **Write** SQL statements to answer a variety of query types
- **Develop** a Userform in Excel (Mac users can place controls on a worksheet)
- **Read** data from a text file into Excel
- **Plot** data in an Excel chart using VBA
- **Export** a chart from Excel into a Word document using VBA
- **Create** text in a Word document programmatically using Excel VBA and save the Word document.

A list of students for the term has been provided by the **ON**line **E**nrollment **S**ystem (**ONES**) in the file called **import.dat** that should be read into the Excel workbook as a new worksheet to chart the class grades.

A picture of the database relationship structure is shown in Figure 1. (next page)

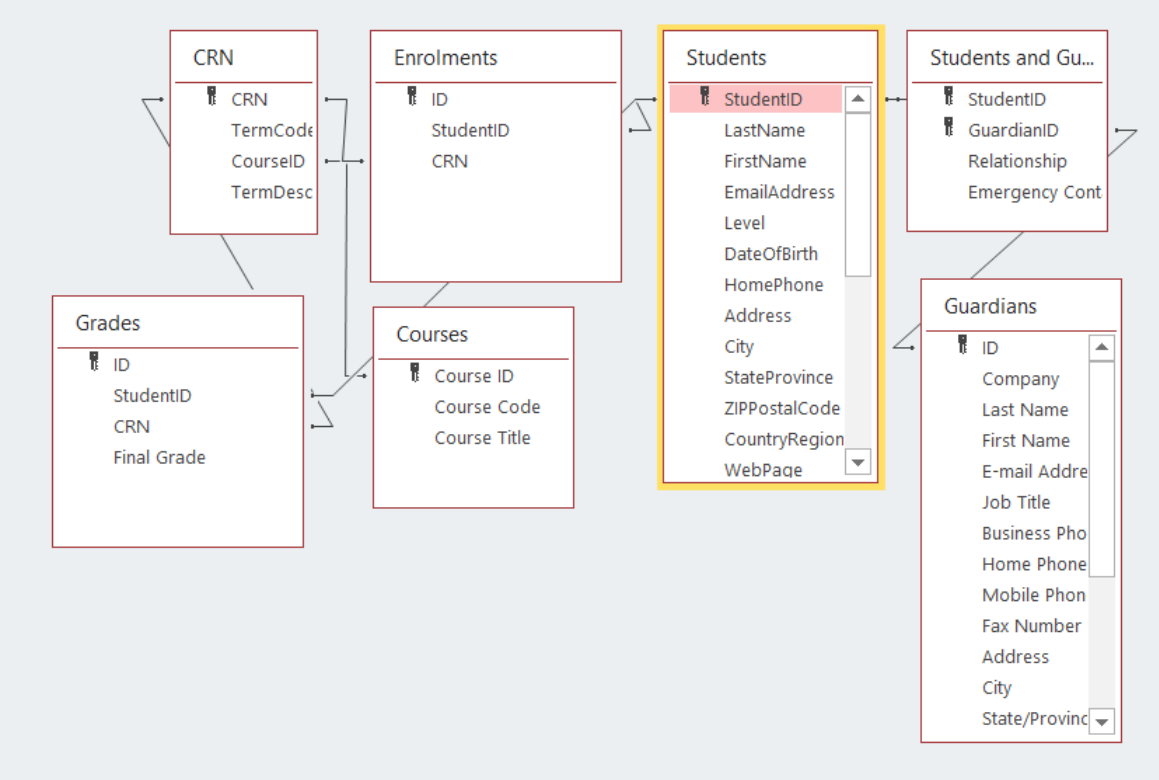


Figure 1: Database structure

Comments

- **finalgrades.dat** is a tab delimited file with a different extension. It **can not** be imported into Excel or double-clicked, your application must read it in using code you wrote.
    - The file format is StudentID,CRN,grade where **CRN** is a Course Record Number which uniquely identifies a course within a specific term (ie. CP212 in Fall vs. CP212 in Winter have different CRN values).
    - The file does not contain column headings.
    - A sample record looks like

      180075 1112 77

    - which is a grade of 77% for CP213 in Winter 2020 for Corene Cleef.
    - The data in this file is completely fake. No real student data is present.
- Your[RH1] application should let the user **browse** to select files that need to be imported.
- Your project may be tested with completely different data, so ensure it works on the data given, and perhaps create some test data yourself to see that it still works.
- You do not have to validate the data; it is assumed to be correct unless otherwise specified.
- Name all variables, subroutines, and functions appropriately.

Tasks to Complete

1. ❑ **Create** a button on a blank worksheet with the caption "**Start**". When the button is clicked, display a dashboard (a userform or new worksheet) which has buttons to perform the following tasks. Label the buttons appropriately.

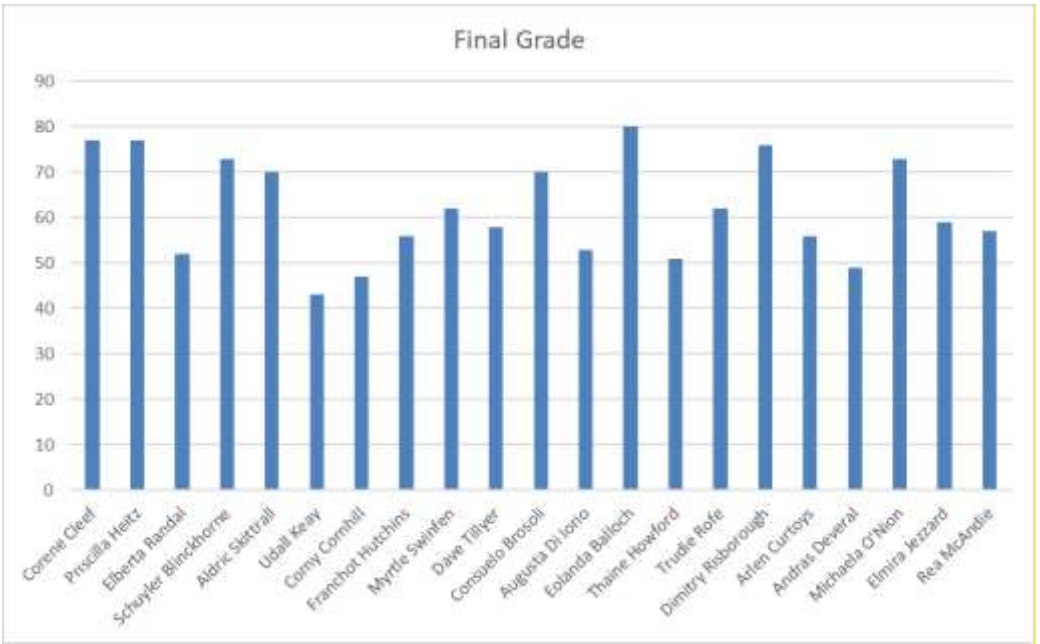
2. Your first step will be to write code that will allow a user to import a list of students from the **import.dat** file and place them on a worksheet.
    a. To make this easier, the file only contains the StudentID field, LastName, FirstName, E-mailAddress, Level, DateOfBirth, HomePhone, Address, City, StateProvince. It is a (Comma Separated Values) file but has a different file extension. Don't change the file extension.
3. Write code to provide the user a way to write the data from the **enrolments.dat** file into the Enrolments table. Place a button on your dashboard/form to run this code.
    a. enrollments.dat is a tab delimited file that lists a StudentID and a CRN.
4. ❑ **Create** a button on the dashboard that will query the database for all the records from the Students table and display it on a new worksheet (requires an SQL query).
    a. You will not know how many records there are, but you will only need to display **FirstName, LastName, EmailAddress, and City**.
    b. The worksheet should be called "**Student List**" using code.
    c. Cell A1 should contain the words "Student List" and it should be formatted as **Title style** using VBA code.
    d. **Bold** and **centre** the table headings using code.
    e. All the code can be in one sub unless it makes sense to place some tasks in other subs.
5. ❑ **Create** a button on the dashboard that will read in grade data from the *finalgrades.dat* and store it in an array.
6. ❑ **Create** buttons on the dashboard for each of the features below:
    a. Allow users to **add** a student a on the list of new students on *a new worksheet*.
    b. If the new student sheet doesn't exist, create one. If it does exist, add the new student to the bottom of the list.
    c. To add a student, use FirstName, LastName, EmailAddress, StudentID (a 5 digit number between 20000 and 30000 that you make up to avoid collisions with existing students), Level, and DateOfBirth as required fields. You can leave the other fields off of your form.
    d. ❑ **Write** a VBA subroutine and the required SQL statement to find the full name and address of all the students from a city chosen by the user and display them on a new worksheet. Full name is the FirstName and LastName values separated by a space.
        i. You can have the user type a city or select it from the list. Dynamically generating the list of available cities would be excellent.
    e. ❑ **Write** a VBA subroutine and the required SQL statement to count the number of students from a city chosen by the user. The output of your sub should say "There are x students from [city they chose]." and x will be the number of students from Toronto.
        i. Use either version of *msgbox* to display that message.
        ii. You can have the user type in a name of the city or select it from a list.

f. ❑ **Create** a button with the caption "Class Enrolments" that will list the course code, course title, and number of students for a term and course chosen by the user. The results will be placed on a new worksheet.

g. ❑ **Create** a button to generate a list of students called "Course Failures" that asks the user to pick a course and term from a list box, and generate a report showing Last Name, FirstName, StudentID, and Grade for all students with a grade below 50. Display the results in a new worksheet.

h. ❑ **Write** a VBA subroutine and the required SQL statement to answer the question "How many students are from St. Jacobs?". Include the query and the answer in your **overview** file.

7. ❑ **Create** a button to generate a class list with **Grades Report (.docx)** as the caption.
   a. You will have to prompt the user for a **Course** and a **Term** by providing a dropdown list to choose from.
   b. You will be generating a Word report from Excel to show the following:
   c. The report will have a title style paragraph with the words "Grade Report"
   d. The next paragraph should display the name of the Course and the term.
   e. The report will have a list of **student full name** and **Grade** for the specified course. Display the full name of the student by listing the first name, then last name separated by a space; eg. Rick Henderson.
   f. The report will display the **Mean**, **Median**, **Mode**, and **Standard Deviation** of the course grades. You can calculate these values using the Excel functions or any other way.
   g. The report will display a chart of the grades for the specified course similar to the one shown here:



   h. The report must include a paragraph that states "The class average was: " and provide the class average (the mean value).

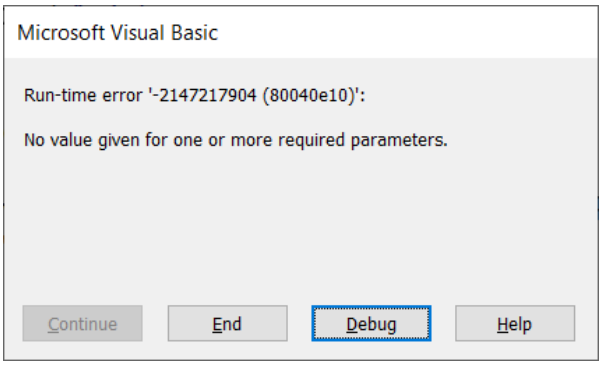
   i. Note: This chart is essentially meaningless, but I included it to make the assignment easier. If you can include a proper **histogram**, go for it instead (higher marks).

8. ❑ Before submitting your assignment, **delete** any worksheets that were created as output for your program, as we will be running it and using your application.
9. ❑ Don't forget to make sure you have covered all the points in this document **AND** on the main A5 instructions file (like the Letter to the Future).
10. ❑ Double-check that all the report worksheets have nicely formatted titles and column headings similar to step 2.

Good luck!

Common Errors

- If your SQL query tries to read from a field that isn't in the specified table, you'll get a run-time error saying "No value given for one or more of the required parameters.":



This means it tried to retrieve a value for a field that doesn't exist, so no value was returned.

- If you are trying to query a field that has a space in the name, you will have to use square brackets around the field name in the query. For example:

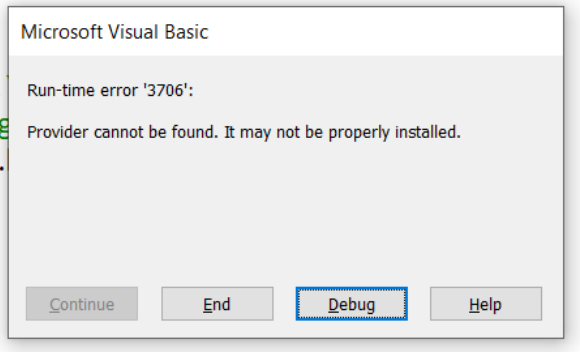
```
SELECT [Country Name], City FROM Countries
```

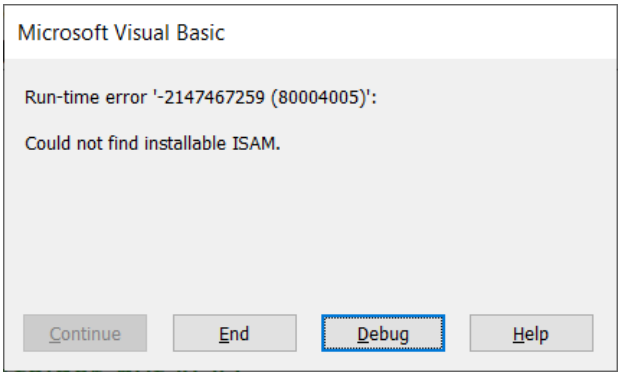
- If you get the message: Provider cannot be found… you may have spelled the provider string wrong.

```
Dim counter As String

' Database is sitting in the current folder, but
' need to replace this code with the FileDialog
  connStr = "Data Source=" & ThisWorkbook.
  providerStr = "Micosoft.ACE.OLEDB.12.0"

  ' Open the Connection string
  With cn
    .ConnectionString = connStr
```





If you get the error "Could not find installable ISAM" it is possible you spelled the Connection string wrong.