

CP212 Assignment 5

Fall 2017

Marks: 100 - Does not use the standard rubric.

Weight: 9.6% (Worth more, I expect more)

Due Date: Saturday, Dec 2 before 11:45pm

If you have problems meeting the due date, please discuss your situation with me.

Please make sure you zip all of your files into a single zip file, and then upload the zip file into MyLearningSpace. Name the zip file `a5_username.zip` where *username* is your Novell username.

Marking Scheme

Application Overview: 5

- A word document called `overview.docx` which explains what your application does and why you chose it. Minimum 2 full paragraphs.

Manual: 5

- A word document called `manual.docx` which acts as a user manual for your application, including how to use it as well as screenshots.
Minimum length: Whatever it takes.

Word Report (your output): 5

UI/UX/Aesthetics: 10

Application: 70

Letter to Future: 5

Total Marks: 100

Objectives

- Create and develop a complete application that **reads and writes information from/to a database**, produces a **chart using Excel**, and creates **a report in Word**.
- Import and/or writes to .csv file if appropriate
- Write an **application overview** and **documentation** in a separate Word document. If you make a game, provide **instructions** on how to play the game as part of the overview.
- Develop your application using **modular programming, error handling** and the effective programming techniques discussed throughout the course.
- **Reflect** on your experience in CP212 and write a letter to future students.

Description

There is a great deal of flexibility in this assignment so have fun with it. Listed below are a number of options for you to choose from. Create a useful application that does all of the following:

- read **and** write information from/to an **Access** database
- import and/or export a .CSV file if appropriate
- generate a report in **Word**
- create a chart in **Excel** using data taken from the **Access** database, and include the chart in the **Word** report

Choose 1 of the following:

1. **Student Marking Application**

An application for storing student grades. See the Student Grading Application document overview.

Tips:

- When reading in the data, store it in an array(s) and then work from there.
- A button to import students - imports the data from a comma separated values file the user specifies. The software should display a FileOpen Dialog to allow the user to choose the file from any location. Use the file methods discussed in class, not Excel's import data tool. Note this is a **.dat** file which is simply a plain text file but can be read in using VBA, not Excel functions.
- You can assume the name of the database will never change, and it will always be located in the current folder (the same folder as the Excel file that contains the code).
 - However, different students could be imported.
- The Word report generated by your application must include a **histogram** of the students final grades as well as a range of statistics for the final grades, or whatever assessment your user chose.

2. **Other Ideas:** Discuss them with me first. Must be able to use Word, Access and Excel. Other types of applications similar to 1. above could include an invoice system, or something used by Human Resources or a volunteer/asset tracking system for a non-profit organization. Stock price simulator/analyzer. Statistical data analysis application. Karnaugh Map Simplifier (logic gates - PC120 stuff).

Alternatively, if you don't like the options above you may try:

3. **BMI Calculator, Chart, and Weight loss/Food tracking App**



Everyone is concerned about health these days, and one common metric for measuring your weight health is called the Body-Mass Index or BMI. Use Excel to

create an app that helps users track their weight and/or food consumption. It should ask the user for weight and height, then calculate their BMI and generate a complete colourized BMI chart like one shown in the reference links below.

Use access to store weight measurements by date, and include the ability to have multiple users in a family.

4. Crazy `Cryption

Write an application that will export each worksheet of your application as an encrypted text file with the .crzy file extension. In Chapter 7 of the text, the end of chapter exercises 22 and 24 explain different **cipher text** or **encryption** techniques. Use either method to create encrypted files and a way to decrypt them. The database requirement could be fulfilled by storing the date and number of characters or bytes that have been encrypted, with data plotted in Excel being the amount of data encrypted by date for a range of dates, pulled from the database. This information and chart can then be exported in a Word report. See me if you are interested and have any questions.

5. Game in Excel

Some simple games created in Excel can be a hide-and-seek game based on a square, grid map. Using a two-dimensional array it is possible to create a 16x16 map that a player can travel through. One famous example includes **Hunt The Wumpus**, and is often used as an assignment in **Artificial Intelligence** courses where the student must write a program that can travel a maze to find and kill the Wumpus. The Wumpus has a horrible stench that can be smelled when you are within 1 square around the Wumpus (think Minesweeper). If the player lands in the same square as the Wumpus, he dies. The player must also avoid bottomless pits (the player can feel air breezing past when he is near a bottomless pit, the Wumpus is too large to fall through the pit). The player has a stun gun/bow & arrow that she can use to stun the Wumpus and win the game. You could create a game where the player can try and win or write an AI program that can win the game and keep track of how many times it can win (a simulator). Typically, the Wumpus lives in a dark cave so the player cannot see the rooms and so is travelling blindly.

For the Wumpus game, you do not have to randomly generate a new map each time, although that is a good challenge to take on, especially for those interested in computer game design. See the references section for some help.

6. Additional (especially for CS majors, but others may attempt): [Sudoku](#) solver, [KenKen](#) solver, [Reversi](#), [Go](#), [Warri/Mancala](#), [Conway's Game Of Life](#) simulator, Karnaugh Map solver, but not Minesweeper.

The Word Report

A typical report in Word would report the results of your application in some way. All reports must contain some text explaining what your application did or the results, as well as a chart from Excel. Typical examples would include:

- a histogram of student final grades, as well as grade stats such as min, max, average, mode, median, and std. Dev. If not a histogram, then another chart is required.
- game statistics, possibly for multiple players (number of games played, high score, average score per game)
- results of multiple runs of a simulator

Essentially, the report is the output of your application, regardless of the type of application you develop.

A Letter to the Future

Write a letter to the future! You will be asked to think about what you have learned in the course and what you think students coming into the course might want to know. You can include things that you would have wanted to know when you started the course.

Write this letter in a separate Word document called **a5_username_letter.docx** and also include it in the Dropbox with your other files inside the same zip file.

Zip all your files together into 1 zip file and upload it to the Dropbox in MyLearningSpace before the due date.

References

1. [An online version of Hunt the Wumpus](#)
2. [Wumpus at Wikipedia](#)
3. [Wumpus image](#) for more explanation (breeze from the pits is not marked on this map)
4. [How to Build a Maze](#) - reference from MazeWorks.com to create a basic, grid-based maze
5. [Encryption at Wikipedia](#)
6. [BMI Calculation](#) and sample [BMI Chart](#) or you may see one in your doctor's office