Computer Science is one of the innovative fields and constantly evolving from hardware and software perspective. From hardware perspective, take an example of computer machine size, it used to be of room size years back and now a days we can see computers almost of a palm size. Similarly, the software languages were also evolved from writing in COBOL with no GUI (Graphical User Interface) to 3rd and 4th generation programming languages such as Java and Python etc. where the code gets generated with moving and connecting the components. The two emerging trends that I will be describing are “Mobile Applications” and “Data Science”.

**Mobile Applications:** I personally think that the smart phone or mobile device are becoming a minicomputer since I can do my shopping on the phone, use it as a navigator when driving, take care of credit card payments etc. There are more and more mobile or smart apps are getting developed. The IOS and Android are the two market leading platforms for building mobile apps. During my last term, I have built an Android mobile app as part of the final project which positioned me well to be successful as software engineer. The developers need to learn Android and IOS programming and also should understand the user interface development frameworks such as HTML, JavaScript, Angular etc.

**Data Science:** Data is playing a key role in any type of industry whether it is retail, healthcare and travel etc. All most all the organizations are investing in mining, enriching and analyzing the data to understand the trends and behaviors of the consumers. For example, the retail organizations would like to know the most visited items and items added to shopping cart but not bought etc. In addition to it, people purchasing items by zip code and age group can be analyzed easily. These would help the business to do targeted marketing and offers by location. It requires a new skill to software engineers such handling large volumes of data, mining and analytical techniques.

As part of this program, I have completed the courses “CS-360 T3244 Mobile Architect & Programming” and “DAT-220 Q1835 Fundamentals of Data Mining” which helped me to position well for both the above emerging trends.

**Part Two:** I have selected the artifacts for all three categories and started working with “software designing/engineering” category and please find latest status for all categories below.

**Software designing/engineering:** I am at the status checkpoint 6, working on the uploading to eportfolio. The enhancements include adding documentation to code, removing unused code and variables, re-designing “AddUser” component to allow user to create account only when username is not taken by anyone else. In addition, updated the code to create password length to be of minimum 6 chars.

**Algorithms and data structures:** I am at the status checkpoint 3 for this category of artifact, submitted; awaiting instructor feedback. The security template is enhanced to include three complex data structures secure coding standards – “Always initialize pointers values to nullptr”, “Do not use pointer arithmetic on polymorphic objects” and “Pair the memory allocation and deallocation functions correctly”. Data structures are complex in nature and prone to security vulnerabilities and following “secure coding standards” is only the way to prevent from security issues. The updates include compliance and non-compliance code example, security issues if not followed and the severity of vulnerabilities & remediation costs, and scanning tools to detect vulnerabilities in the code etc.

**Databases:** I am at the status checkpoint 3 for this category of artifact, submitted; awaiting instructor feedback. I have re-written MySQL inner join query with advanced joins such as left and right joins. In addition to it, I have also added queries to alter the table with options of dropping and adding columns etc.