The first perspective seminar for MATH2504 was from Dr. Amy Chan, a mathematician, statistician, and software developer who currently works as a consultant for the industrial mathematics group Polymathian. Amy studied pure mathematics in her undergrad and honours, focusing on analysis and optimisation. During this time, she learned to code, originally doing so she could code computer games. However, she eventually used this skill to verify results from her mathematical studies. Out of university, she worked for CSIRO in applied image analysis, using her coding and mathematics skills to first study the effectiveness of different wheat growing methods and then determine segments of the brain in MRI scans. After CSIRO, she pivoted to the private sector and into her current job at Polymathian.

In a nutshell, Polymathian’s primary business model is that they give businesses a way to outsource their mathematical problems to qualified experts, who can solve the given problem. Such problems include management of energy recourses in a hydroelectric powerplant, rostering of shipping crews and mining optimisation. The company primarily focuses on computational solutions, with the four main approaches being: Machine Learning, Simulation, Optimisation and Statistical analysis. With this, many different tools and coding languages are used such as Python, AWS, R, Excel and many others (most of which I was somewhat familiar with). Together, these techniques are used to provide two main services to clients; consulting and software development (although they are not mutually exclusive). Through SD, Polymathian designs programs to solve industry problems, which are either made on demand or sold out to clients. Amy works for the other arm of polymathian, consulting, in where the team of mathematicians, statisticians and programmers provide one off answers to clients tailored to their specific problem. This often involves a mix of programming and theoretical working behind the scenes; however, the client is generally presented with a brief and set of results which they can apply to their problem. Amy is involved in all aspects of this process.

Through her consulting, Amy has learned how important tailoring her commination style is for different people. A mathematician, especially one working in industry, will have to work with people of many different backgrounds and skillsets. As such, tailoring your communication to suit who you are talking to is very important. In this vein, when working with non-academics, they will most often only be looking for a solution of any form. Your solutions do not be elegant or 100% rigorous, they just need to deal with the specific problem that client has posed.

One specific piece of advice that I found important is that while grades may be important to getting your foot in the door, experience in the field itself is much more important. As such, you should try and get industry experience through summer research programs and the like. Furthermore, many of these opportunities will on the surface seem to not relate at all the field you are studying, or even mathematics. However, under the hood there will be a mathematical or statistical problem that will require your expertise. Amy demonstrated examples of this through her two CSIRO jobs, which in the biological/psychological realm, however required mathematical and programming skills.