Report for presentation week 1

Attendance:

Zachary Dowton, Christopher Hone, Adwait Sengar, Roger Murray, Likun Yao, Joshua Tomlin, Keeley Hoek, Mitchell Rowett, Yossi Bokor, Yiming Xu

Material covered:

◇ Definition of adjunction

◇ Definition of naturality

◇ Definition of unit and counit

◇ How to translate the naturality axiom to a commutative square, how does the square arise from these functors, and how to get the natuality of unit from the natural bijection mentioned in the definition of the definition of adjunction.

Difficulties or confusions:

When preparing for my presentation, I had a question and I searched for help in the class:

In many pages of the textbook, we are only gives a half of a proof and the other half would be obtained from duality, but how does the duality principle apply on, for instance, getting the naturality of the counit from the naturality of the unit?

We discussed about it, and although time did not permit us to make it completely clear, someone gives an idea about it. I posted the question on math.stackexchange (https://math.stackexchange.com/questions/2661391/applying-the-duality-principle-to-adjunction) and asked my classmate to answer it if someone can solve it (Still no answers up to now).

Topic covered in the discussion after the presentation:

Mitchell talked about something about the string diagram.

Evaluation:

This is the first presentation of mine. As a non-native speaker of the English language, I felt quite nervous when talking in front of eight persons. In order to give the speech fluently, I practiced at home and wrote up quite a lot of materials so I can memorize some of them and avoid halting for long. Although it makes my speech more fluent, another problem arises: I just said the bunch of things I prepared for, and there is not much interaction between me and my classmates and no improvisational performance. I even forgot asking "got it?" or something like this. Now I think if I just write a short list and some outline and carry it with me,

and keep my mind relaxed (just like consulting my lecture about a problem) during the presentation, it would be better.

For the material, I wrote up six pages of A_4 sheets, but I was only abled to cover three of them. The main problem is that I gave a too-detailed explanation about each point involves "naturality". When reading the textbook, I found Leinster just let us to follow our intuition to understand the word "natural", but after coming into this session about adjoints, he gives the formal definition of naturality and tells us we do need to know about it. That is what makes me believe that this point is important. And since the commutative-square definition would be much more familiar to much of us, I illustrated why the two versions of definitions are equivalent. But now I think perhaps I do not need to give such a long explanation on how to translate the naturality axioms into commutative squares, how does the definition of units and counits arises and why they are natural transformations. After illustrating these stuff in all details, I realized that I was supposed to speak for 30 minutes but I had already took 40 minutes. So I had no chance to give out the rest of materials I prepared which are also very important: about the triangular identity and the proof of equivalence of the two definitions of adjunction.

Another problem was that as I spent quite amount of time on explaining naturality, I need to draw the commutative square, and it takes some time. Now I think drawing a picture during a presentation is a waste of time. Next time if I need a picture, I would draw it in advance.

If I have another chance to present, I would not give any very detailed proof at all, instead, I would attempt to express the "spirit" and give more important facts of the things I would be talked about, so more topics could be covered. For the proofs, if time permits I would only give some sketch, I think that would be enough.