


# **Learning within assessment**

Developing a deeper understanding through group  
work assessment

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# Background

- Pure module 'Abstract Algebra' based around applications
- Final year elective
- Group theory 
- Monoid theory
- Workshop sessions
- 3 years old

	Number of students
2012-13	28
2013-14	28
2014-15	55
2015-16	≈60

# Assessment

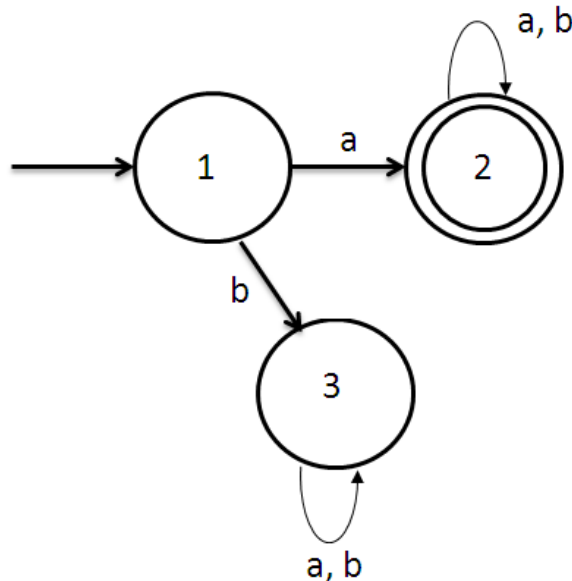
- 50% coursework
  - Assignment 1: individual task on group theory
  - **Assignment 2: group task on formal languages**
  - Assignment 3: individual task on formal languages
- 50% exam

# Formal languages and automata

$$A = \{a, b\}$$

$$L_1 = \{aw : w \text{ is any word over } A\}$$

DFA:



$$L_2 = \{a^n b^n : n \in \mathbb{N}\}$$

# Group assignment

- Groups of 4 (min 3, max 5)
- Support groups
- 6-8 weeks

# Group tasks

Create your own examples of languages.  
Create some recognisable languages and  
at least one language that isn't  
recognisable.

Use the methods from the course (list  
provided) to show your examples are either  
recognisable or not recognisable.

# Individual task

Produce a reflective summary of how the assignment has gone (maximum 500 words). You may wish to reflect on the following:

- How you worked as a group
- How you found creating ideas/making decisions
- How confident you feel about the formal languages part of the course
- Areas you need to work on

# Mark scheme

Marks	
70+	Examples carefully selected to demonstrate techniques listed. Calculations correct. Results and conclusions clearly presented and explained. Clever links made between the different techniques and sophisticated examples used.
60-69	Examples carefully selected to demonstrate techniques listed. Calculations mostly correct. Results and conclusions clearly presented and explained. Many links made between the different techniques.
50-59	Some techniques applied correctly and basic examples presented. Work lacking some detail and / or explanations. Few links between the different techniques.
40-49	Some techniques applied correctly. Work lacking detail and/or explanations. Examples for the different techniques not connected.
0-40	Insufficient evidence to show that the techniques can be applied correctly.



# Disadvantages

- Marking



- Problems with group work ?

# Peer assessment sheet

Your name		
Other group members	Member A	
	Member B	
	Member C	
	Member D	

Consider the contribution that you and the other group members made to group effectiveness. Give each person in your group (including yourself) a score for each of the criteria below. You should award a score of 0 for no contribution, 1 for a contribution below the average, 2 for a contribution which was about the same as other group members and 3 for a group contribution which was above the average.

<i>Criteria</i>	<i>Me</i>	<i>Member A</i>	<i>Member B</i>	<i>Member C</i>	<i>Member D</i>
Leadership of meetings and discussions					
Organising the group's work					
Deciding which languages to pick					

# Advantage: confidence

- Working as a group helped to **increase my confidence** in this module.
- I feel this assignment has **helped to bring together everything** I have learnt in the second semester. I now feel **a lot more confident** with the formal languages work than I did before attempting the assignment.
- After completing this assignment, I feel **a lot more confident** with the formal languages part of the course.
- I feel that doing this assignment has **made me feel confident** in the content we have learnt in this part of the course and I feel good about starting the next assignment.
- Before the start of this assignment I didn't feel very confident with the majority of the content of the formal languages section, however the more examples we have done over the course of this assignment, the **more confident** I feel.
- After doing this assignment I can say that I am much **more confident** with this part of the course. What I like about it is I know by doing the assignment well it will help in the exam so it is beneficial.
- Before beginning this assignment I wasn't confident with formal languages at all but now completed I **feel very differently**.

# Advantage: peer tuition

- This assignment has **helped to fill in the gaps** in my knowledge by allowing members of the groups to go away and work on what they are strong with, then report back to the group to **help teach them the process**.
- If any one of us didn't understand how a technique worked on a particular language the other members would take the time to **teach** that person.
- By the end of this assignment **we all felt more confident** and this was because we had **all helped each other to understand**...this enabled us to then be able to go off and do individual work on different parts of the assignment.
- Before completion I feared I would struggle to complete the work with any ease, but by working with my group we were **able to help each other** and explain parts that we felt confident about and get help from parts we were less so.
- **We all had our strengths and weaknesses**, which were useful as we could all help each other.
- I also find it **useful** going through questions with my group where we can all **help each other**.

# Advantage: peer support

- We worked in group sessions in order to **provide support and encouragement** as well as to **pool our collective knowledge**.
- I found this to be a particular strength in our group in that we **constantly provided support for each other**

# Advantage: reflection

- I still feel I could go over a few parts in this section, just to gain more confidence.
- It has also enabled me to **realise what are my weak points**, and when it comes to exams **what I should focus revision on**.
- There were some areas that I need to work on more.
- This assessment has **highlighted any of the areas which I am less comfortable with**.
- I feel there are still some areas I need to work on before the exam.
- One of the techniques I definitely need to revise further is showing a languages is recognition by a monoid, although I now have a basic understanding of this technique.

# Advantage: revision

- I do feel like this assignment is kind of **revision in itself**.
- Doing this assignment was also **good revision** for the exam in the summer.
- The work we have done for this assignment (if correct) will be a **great tool for revision**.
- This assignment was a **good revision tool** that allowed us to see where extra work is needed.
- It was a good opportunity to **revise** the material and **concentrate on areas which I was unclear about before**.
- By completing this group assignment and generating our own examples, I believe it will **aid my revision and confidence**.

# Advantage: more examples

- **Given me more examples** of the different techniques.
- Initially before starting this assignment I have been very confused during the lectures as to what is going on sometimes, struggling to follow the work being set. However, this assignment has helped me a lot, **getting help** off my group mates and simply **working through multiple examples** of the work involved.



# Advantage: learning / understanding

- By having a group assignment we have been able to **pull on each other's strengths** and help to **develop our understanding** of formal languages.
- Working as a group helped as we were all good at different techniques so we could go through examples with each other to make sure we all had an **equal understanding**.
- However, **having learned a lot during this assignment**, I feel confident that I should be able to improve in these areas fairly easily.
- To conclude, this assignment will be very beneficial in numerous ways, because it **helped my understanding** of the subject in general and helped to **gain other peoples perspectives of things**.
- This group assignment has definitely made me **understand the concepts more** and therefore has been hugely beneficial to me and has made me feel more confident for the exam in May.

# Advantage: learning / understanding

- In conclusion this assignment has proven very beneficial to me. It has **improved my understanding** of the various parts to this section of the course and the subject in general. Working as a group has played a major part in the **development of my knowledge** for this module.
- My confidence increased and I feel like **I understand more**.
- In areas where we all struggled, we **worked as a team** to attempt the problem and **gained a greater understanding** of the work by doing so.
- I feel by doing this assignment and going through numerous examples in my group on the worksheet and for our own languages, I now have a **better understanding** of this section.
- From doing this assignment I have gained **more of an understanding** of how to obtain a solution and produce problems to suit the techniques we have learnt.

# Advantage: deeper understanding

- I feel that this assignment has been a very **useful exercise**. It has not only helped me **improve** the skills I believe I was strong at but also refresh those I was weak at. I believe that this assignment has been a welcome break from traditional algebra assignments and that this task has given me such a **deeper understanding** of formal languages which may not have been achieved by a usual algebra assignment.
- Gained a **deeper understanding of why the methods work**.

# General comments

- Overall this has been an **invaluable assignment**.
- Working within a group created an **alternative dynamic to the usual structure of a pure mathematical module**. I found it particularly **useful having a team to refer to** concerning any problems I encountered. These issues would normally require me to partake further reading or consulting a lecturer, however instead I found I could address the group and share limitations, as well as aspects we surpass in.
- I think doing this assignment together will be really useful when it comes to revising for the exam because **we will continue to help each other understand the work**.
- Working through as a team and **discussing every step** with the approach needed to get to a conclusion was a really useful part of the process.