Topic 3: Signal Processing (Groups 4 and 6)	
Positive Feedback:	**Room for Improvement:**
### Group 4 - convolution and discrete fourier transforms sections were strong with good examples and visuals ### Group 6 - Examples were very good, particularly the audio signal examples - Figure 3 is a very effective visual on describing edge detection Really solid video and summary.	### Group 4 Focus more time on a few topics rather than trying to sample them all; for example: more detail in convolution and fourier transforms, and only briefly mentioning faster fourier transforms. A diagram or two would have been a good addition to the summary as well. Add more plots and visuals to the video, particularly in the second half of the video. ### Group 6 Not much to say really.
While Group 4â€™s approach is simplistic compared to the Group 6â€™s 45 pages of content, both teams were about to explain their approach clearly. Group 4 focuses their bulk of the presentation showing their results of Fast Fourier Transforms is same as a calculating DFTs. For Group 6â€™s case, they were able to demonstrate their code against their own examples before resorting to using existing Julia packages to finish their project. I find it to be quite amazing that the team could reduce their content down to a one-pager. It appears in the Julia notebook and from their video that they were sufficiently prepared with their amount of material to clearly demonstrate their expertise and understanding for this project topic. Well done team!	Suggestions for Group 4 to improve is to try and customise their own examples in order to apply a level of creativity and originality in the assignment. If existing code is used, reference where the code comes from and try to build on that (e.g. build your own functions to extend the pre-existing code). For Group 6, the suggestion is to tie in the certain keywords from the summary to the video presentation. From the summary, topics such as Vandermonde matrices were mentioned, which resembled a similar matrix for Group 6â€™s video at 1:14. Other than this, both the video and summary for Group 6 contained great information for readers to understand the context and meaning behind Fourier Transformations and Convolution algorithms applied on audio and image data.

The topic 3 includes group 4 and group 6. The project of group 4 illustrated a lot about basic mathematical theorem behind signal processing, including convolution, Fourier transform, and shift as well as circulant matrices, which are clearly logical and explicit. Personally, this is a perfect educational illustration of these mathematics, and is also understandable for learners. The project of gourd 6 attracts me for they illustrated vividly the project via exemplifying audio signal processing and feature extraction.	The project of group 4 can be improved via a closer combination of mathematical theorem and practical application of signal processing. For both the video and summary did not explicitly explain signal processing. Therefore, group 4 could do better if they can apply an example to describe how signal processing achieves. Actually, group 6 accomplished the project perfectly. But it would be better if group 6 can expand some basic explanations of mathematical theorem as explicit as group 4 did.
I like the introduction of Fourier Transforms in Group 4 It shows the process of Fourier Transforms, very clear, including how to inverse, how to transform Omega matrix and how do matrixes influence photo. Itâ€™s very interesting. I like the voice and picture processing in Group 6 It shows the how they though change matrix to get more different voice, respectively frequency domain and time domain.	Both group did a good work. But they can do further effort. In Group 4, I think they can explain on how DFT and two types of matrix influence the picture. They just told us they have link, but not explain why. In Group 6, I think they can explain more in part of 2d picture, and do more practical experiments in this part.
Group 4 explains the code cleanly and step by step. Group 6 provides soundtrack evidence which is easier to understand.	Group 4 can add more information about the Terminology. Group 6 can remove background music so that the audience can focus on their excellent presentation.
Group 4: The presentation and summary report contain information in proper order and quite simple, hence it is easy to understand the concepts. Group 6: The presentation is quite notable and expressive, also covers different range of examples like two use cases are considered in case of convolution theory. The summary is very well summaries & covers the topics with relevant examples.	Group 4: Theory would have made more sense if explained with examples. Besides, shift matrix and circulant matrix theory could have been explained further. Group 6: Overall the presentation and summary report is quite impressive, however, There is no proper mentioning about shift matrices and circulant matrices.

The content of the video and summary in Group 4 is completed. They not only give the convolution and Fourier transform a basic introduction but also explain shift matrices and circulant matrices clearly. Group 6 produced the video very well. They not only add the background music but also put a certain audio record when they explained Fourier transform, which made them attractive and understandable.	For group 4, it might be better to use more realistic examples to introduce the topic. As for group 6, it would be clearer to add some markdown for the code they write.
Group 4: In their project, they present how to use the convolution of two vectors to smooth time series, and the process of smoothing the picture by using the convolution of two matrices. This could give a More intuitively feeling of the application of signal processing. Group 6: From their summary, I know the basic process of how Fourier Transform used to enhance images. (They give a flow chart of the process.) Apart from this they also give examples of applications of Fourier Transform in their summary. I have to admit that their video is awesome! The beginning of it is really eye-catching that compared to other groups (of course, it is much better than the video of my group).	Group 4: They mentioned â€œX spaceâ€ and â€œfrequency spaceâ€ many times in their video, but there is on any introduction or explanation of these two things. It is good for them to show the practical application in their jupternotebook, if they could add this part to the summary, that would be nice. Group 6: I think they did a great job.
Group 4: In this video it has three parts which introduced some methods to calculate the convolution of vectors and matrices. The speaker visualized her code by the examples of ECG signals and image blurring to show the applications of the convolution on signals. We can also use an inverse method to decrypt those transformed signals, which reminds me of extracting the zipped files. From the summary, there are full of equations and identifications, which makes me feel scared at the first glance. But I have a further understand about why this method can be fast from the equation. So indeed, the learner still needs the equations. Group 6: In this video it shows how to use DFT to clean the sound signal without noise and how to detect the edge, sharpening or embossing a jellyfish image, which are pretty attractive. They also introduced the DFT method and a Julia inbuilt convolution function and taught me a lot about how does this works by some real examples. Less equations, much attractions, which highly raised my interest in signal processing. In their summary they provided detailed information in Fourier Transforms and convolution. The pictures clearly show the process in the frequency domain filtering operation and how does the convolutions be applied to vectors and matrices.	Group 4: Itâ€™s hard to explain so many codes in a short time, so maybe they could introduce more applications with more graphics in their notebook and show some pictures in their summary. Also, this video will be better if itâ€™s a full-screen recording. Group 6: Introducing so many applications is really attractive to a beginner. But from the summary there should be more equations and have a better text typesetting in order to let the reader easily find their highlight point.

As for the group 4, i think their video is really well, their video even has the subtitle to help us understand. And their summary cover the three points of this topic which i think is fair enough. As for the group 6, they made an amazing video. But i think maybe they lost the the part of shift matrices and circulant matrix.	For group 4, i think their work is Impeccable. Maybe they should add some comments for their code. Make them more readable. And for group6, they have a great video, so i think the only thing they should do is add the lost part. Also some comments for the codes is better.
For the first group(Group 4), I like their starting point of talking about vector convolution and then move on to more complex conditions. This really helped us who never learned the content to catch up with the topic. For the second group(Group 6), I like their well and clearly recorded vadio and well structured Markdown contents, and the really clear examples included in the project.	Group 4: More convolutional contents like edge detecting or pooling could be included as well for these are all typical use to convolution. Group 6: Very good presentation. So if I have to say some improvement, I think you could explain some basic theories or some content to show how real convolution works.
G4: Content coverage is complete and clear. I've learned a lot from the video not only about the code but also about the theoretical knowledge at the same time. G6: Process flow is clear and specific, easy to follow as well. Use step-by-step code demonstrations to help the viewer understand this topic. The logic is clear and easy to understand.	G4: It will be great if add the code to carry out convolution of an image signals. G6: The summary doesnâ€™t cover â€œShift Matrices and Circulant Matricesâ€ part content. Adding more formulations also can help us to understand this topic.
Group 4â€™s presentation was a good technical introduction to the complexities of implementing these DSP concepts with Linear algebra. The video was well paced and covered the topics well. It piqued my interest in the subject Group 6â€™s Summary was very readable and the video introduction was very professional. The rest of the video was also well timed and with good overview demonstrations of the concepts. The audio waveform before and after fourier tranformations and the plot of the frequency magnitudes in the middle was particularly illustrative of the fourier transformation approach. I liked that, although the mathematics was present in the notebook, it did not overwhelm the presentation.	Group 4â€™s PDF summary did not seem as clear as the video and the notebook. Some of the English distracted from the demonstration of the mathematical concepts. I cannot think of any way that Group6â€™s Summary and Video presentation could be improved, without exceeding the allotted 6 minutes. Some of these DSP concepts deserve more time than this.
Group 4 gives a fairly in-depth explanation of the linear algebra aspect in signal processing. This team starts the video by explaining the theory and then continues with an example, which is a helpful approach. A cursor used for highlight and the subtitles added on the video helps me understand the flow. I think Group 6 has used all the tools needed to make an exciting video. The mathematical explanation also starts with things familiar to the general public, for example, regarding audio filtering and image enhancement â€” this approach suitable for me with an engineering background. Colour pointer helps the viewer to follow the explanation steps easily.	With a proper explanation per section, what can be improved from Group 4 is how to convey the relationship all of the sections to the viewer. Thus, the viewer can receive one complete information about signal processing. And for Group 6, so far I have not found something that needs to be improved from the video.

Group6: Summary is clear enough to understand the basal idea of signal processing. Nice video and clear explanation. Give enough examples of using it. Really like the example that they add noises then clear the noise to show how the method works. Group4: They provide subtitle for the video and code is easy to understand. Focus more about the formulas.	Group4 : Use more words to explain the main idea of this formulas. Group6 : Give audience more time to see and understand what the code is and more explanation about how the code works.
I found it the code by group 6 to be interesting and very applicable with the example of audio filtering and image classification. Their narrative to the topic are very well structured and engaging with the graphs and audio to demonstrate the examples. It also helps that the narrator follows the code closely and describes in details what happen in each step. Very well done and educational code! As for group 9, I found that their examples for discrete Fourier transform with the plot is quite interesting in term of describing the transformation. Their image processing example within the codes for smoothing using convolution is also very well done. The summary is succinct and easy to understand without having much background on the topic. Also very nice of them to include subtitles for the audience.	While group 6 was very comprehensive with their codes and summary, I found that the summary could give some more explanation on what Fourier transform does in concept, in addition to the mathematical operations. It is also somewhat disjoint between the summary and the code, assuming they should compliment one another, as they seem to be following separate narratives. In comparison to that, group 4â€™s summary is somewhat lacking in technical explanation. Their code follows the concepts quite closely in terms of what is in the summary, but lacking of explanation of what they were trying to achieve with their program.
The speaker in the video of group 4 speak clearly, and the code are well designed and organized. And there are plots which let people easier to understand. The summary looks good and there are some highlights to let readers know what they are introduce. The video of group 6 use sound in the examples which is good for understanding. The summary looks professional and well organized.	In the video of the group 4, they can put the key idea in notebook. In the video of the group 6, they could modify their notebook into the same format. And summary can be more richful.

Group 4 This group tries to illustrate the use of convolution with interesting examples i.e. time series smoothing of ECG signal and 2D image blurring. The video and summary are well set out and structured according to clear topics. Group 6 The video and summary from Group 6 includes great explanations of concepts which include the mathematical theory as well as real world applications. They have used different kinds of signals to illustrate processing techniques i.e. sound and image, which aides in understanding further applications. They have included useful diagrams where appropriate to concisely illustrate topics but also included extensive explanations that cover the topics in great depth. Overall, material was set out very well with appropriate focus on key concepts.	Group 4 Several concepts were explained in mathematical theory but was not well connected to their application. This meant that some examples were difficult to follow because the justification for each step was not given before continuing. Generally, I think they dove into technical applications too quickly before establishing the core fundamentals. Group 6 Overall very well put together but does expect substantial knowledge of underlying concepts. A few additional reminders/explanations of assumed knowledge could have made the more advanced topics clearer.
Group 4: They start with the basic convolution concept, talked about the vector convolution, and gave an example about the vector convolution applied to time series smoothing; next, introduced the 2-D convolution, which can be applied in image blurring. The concept and application of convolution are apparent, easy to understand. As for DFT, The example they provided I think is not very clearly, Group6 First, they talked about the Fourier Transforms, gave an example about the DFT applications. They give a 440 Hz voice, and put some noise in the sound, they used DFT to extract the original signal interfered by noise, this shows that the DFT can handle interfered signals. For convolution, They only talked about the convolution in 2D image signals, such as image blurring.	The group 6 seems didnâ€™t talk about Shift Matrices and Circulant Matrices. For convolution, actually there are many applications of convolution, such as Audio filtering, communication channel, but in this video, they only talk about the image blurring, I think they can provide more example to help people understand the convolution .in their summary, they can speak about vector convolution, matrix convolution. Group 4 should give a more detailed explanation of the definition of DFT, rather than only focus the formula. I think their examples of DFT are not clearly; they should give more detail, such as DFT application in signal, graph, and solve partial differential equations.

The videos of both groups were made very well. For group 4, The video content is very clear, and the interpretation of each code is very sufficient. Using the method of visualization, the process of image blurring is given, so that we can understand the function of signal processing directly. For group 6, Video content is very rich, two main methods of signal processing (filtering wave and convolution to 2D Images) are given. The code is very detailed, audio and images are added, so that we can intuitively understand the process of signal processing.	For group 4, in the summary part, the formula is simply listed, but the practical application scope of each part is not specified, there is no explanation of the relationship between these formulas and signal processing. For example, the relation between DFT and inverse matrix of DFT is not clear (why we need to get the inverse matrix). For group 6, the content of the summary part could be more comprehensive, for example the summary doesnâ€™t cover continuous Fourier transform and the topic â€œShift Matrices and Circulant Matricesâ€.
Group 4:Group 4 did a really good job with their video attaching subtitle, and their explained very clearly. Group 6:Group 6 also explain this part well and their attached lots of codes to explained these concepts for us which made it clear for us to understand it.	Group 4: they did really well, maybe they could imply more comment in their code. Group 6: they explained well but comparing with Group 4, they introduced the Fourier Transform directly and lacked parts of concepts.
