# 1.4 Conclusion / Discussion

We started the report with explaining the game SET, it’s a game about finding the most SET’s the fastest. Our implementation uses a computer to play against, if you do not find a SET within a given time, the computer takes a SET and gets a point. We explained our game-loop and algorithms in paragraph 1.2, our game-loop mostly works on if-statements and of course event handling, these parts in our code are explained using comments. Our class for the cards does most of the calculation work, it can check if three given cards form a SET, it can find a SET from any amount of cards and it is able to randomise the card making process. We also made a class for the buttons, because we wanted the game to work with buttons instead of an input bar. In paragraph 1.3 we give a manual on how to play the game and it explains what each button does. Finally we will discus points of improvement and possible extensions on the game.

## Improvements

Our code is very long and in some places very repetitive, we could improve our code by shortening it. Our way of showing the cards on screen and checking if the cards are being clicked takes up 115 lines of code, we could probably implement this in one of our classes or make some kind of for-loop. This would save a lot of the space, the same goes for how we load our images, there is a way to implement this in our card class, we just don’t know how. This goes for a few more repetitive parts, if we designed the card class to preform these operations instead of putting the same code for all twelve cards, then this would greatly decrease the size of our code. We haven’t been able to achieve this, it’s mostly due to our unfamiliarity with classes. It was just easier to make a lot of if-statements, than using classes for us.

Another place for improvement is our algorithms, the function that finds a SET from twelve cards has a time complexity of , this is not very efficient. The code makes every possible combination of three cards to find a SET. We could also work with the fact that for every two cards there only is one card to make it a SET. Then we would only need to make all combinations of two cards and check if the third card is part of the remaining ten. This would give a time complexity of , which is more efficient than what we have now.

## Extensions

We have already added a few extensions, for example the computer shows which cards it chose, therefore you can see which SET you missed. We of course added buttons to make the game more engaging. There is a help button that also pauses the game, you can exit the game at any time, you can go back to the begin screen and select a new difficulty, and we added an end screen showing the final scores. Possible new extensions could be adding animations for replacing cards and to make the game even more engaging. We could also add sounds and music for the same purpose, but we think our game mechanics are complete and do not require extensions. The only extensions would be cosmetic and not change the game-play in any way.