CHAPTER 6: CONCLUSION
6.1 Introduction

This chapter summarizes and concludes the dissertation. In addition it suggests some potential areas for further improvements to address the limitation in this work.

6.2 Outcomes of Research

Based on the objectives (refer Section 1.3), the researcher found that the current timetable that is used by FCSIT is always changed and not feasible to use. Timetabling is complicated due to many programs, lack of classrooms and laboratories. Many lecturers are involved in preparing the current timetable. It’s taking too much of their time. To overcome all of these problems, the prototype system has been developed in order to cater for this problem.

There are many approaches that have been presented in solving the timetable system. They are the heuristic approach, integer programming approach, graph coloring approach, network streaming approach, logical constraints arithmetic approach, knowledge base approach, Tabu searching, annealing simulation and Al-Khwarizmi Genetic. The researcher found that the Al-Khwarizmi Genetic is the best approach in solving the FCSIT timetable system. The use of Al-Khwarizmi Genetic retracking and filtering is very important and produces a feasible timetable, that is each timetable produced do not clash or an occurrence of lost of subject. In the event that the contrary occurs, Al-Khwarizmi Genetic will impose a high penalty and a selection process will be done, the timetable with a high cost will not be selected for the next generation. It also shows that by dividing the constrictions into two levels mainly the higher and lower constrictions a proper and quality timetable is produced. The use of the heuristic rule and Al-Khwarizmi genetic could ensure that all high constriction conditions were fulfilled to ensure that the timetable is feasible. This is because if the heuristic rule
failed to generate a feasible timetable hence the function in Al khwarizmi genetic will cause a high penalty that the said timetable is no longer chosen for future generations. Hence a feasible timetable is of utmost importance to ensure that the Al khwarizmi genetic is able to settle as many low constrictions as possible.

In this dissertation, a timetable system was built and also known as Timetable Management System. The system has implemented three fundamental traversing modules, there are lecturer module, student module and administrator module. Each module has been tested by the four users who have knowledge on this field.

6.3 Limitations and Suggestion for Improvement
A number of weaknesses suggest some possible technical enhancements to the Timetable Management System. The Timetable Management System currently has one database where the administrator has to key in the detail of the personal information about the students and lecturers. University Malaya has a database call ISIS which store information about the students and lecturers. The Timetable Management System has to connect to the ISIS database to get the updated information. The Timetable Management System can only be used for the lecturers and students of FCSIT. The researcher found that the system can be extended to another faculties in the University of Malaya. This is because the system has fulfilled a basic requirement of the timetable system.

6.4 Future Research Recommendation
From using this system the scheduling time may be saved which is deemed as a routine duty that is monotonous when each time a change occurs such as the addition of a lecturer or subject yearly. This computerised system will attempt to construct the best
timetable based on several parameter entered by the user. Even though this system may be able to produce a good timetable, there are still many matters to be studied, as an example:

- Looking for the most suitable method to schedule a joint class, lab class and classes conducted simultaneously. In this system, the classes may be ascertained in the heuristic manner, that the shifting and alternating process will be done when the cross over and mutation process is completed. This will result in many weakness as an immense change will occur to the entire schedule, and will result in the possibility of an increased total cost.

- Most research journals on this problem only involve a one period subject. Abramson (1991). In this system, two periods and one period subjects are very important from the early level of population as the same subject will be occur several times in a week.

There are researchers who found that the subject is not consecutive in nature by taking into consideration the following matters at the early population level Colorini et al (1998). This will only cause complexities in scheduling and thus more processing will be required. The researcher found that the Al khawarizmi Genetic is the best approch to solving the timetable system.

### 6.5 Conclusion

This thesis is very useful to FCSIT. It can help the lecturers to develop a systematic timetable and easy to use. Eventhough, the system is built and used for FCSIT, it can be extended to another faculty in University Malaya.