$$fitness = \sum_{i,j=1}^{n} w_{ij}$$

Where

$$w_{ij} = number\ of\ one's\ of\ the\ four\ digit\ binary\ number$$

C. Crossover

In this work, multi-crossover technique was used [1], as it guarantees best results in a short time if two individuals produce 100 children.

D. Mutation

The mutation operator used in this work is bitwise mutation.

E. Experimental results

For creating the timetable in this work, the actual data for the Faculty of Information Technology, University of Benghazi was used. The results were very promising, as we produced the faculty timetable that was free of clashes and fit the Faculty requirements. More specifically, 16 classrooms were booked in 3 - 5 minutes, and when the number of classrooms was reduced to 10, the time is increased to 7 - 12 minutes.

VI. Conclusion

In this work, new GA chromosome representation and fitness function was used to solve a timetabling problem. We implemented the algorithm using Matlab language and the actual data provided by Faculty of Information Technology, University of Benghazi, as a case study. The results we achieved were successful. This work can be applied to any scheduling problem and is thus valuable contribution both to the academic field and practice.

References

[1] Y. Elhaddad, A. Ganous, "New crossover technique for genetic algorithm" *International Conference on Computer and Software Modeling (ICCSM)* Manila, Philippines (2010)