Form 4: Results and conclusion

1.Team No: 16

2.Project Title: AUTOMATIC TIMETABLE GENERATION

3.Experiment Environment:

a) **Execution Environment:**

1.Development Language and Framework:

- Java 8
- Java Server Pages (JSP)
- Servlets

2. Database:

- MySQL database

3. Frontend Design:

- HTML 5
- Cascading Style Sheets (CSS)
- JavaScript
- Bootstrap
- Ajax

4. Web Server:

- Apache Tomcat-9 (locally hosted during development)

b) Experimentation Data:

- Sample input provided in the form for testing purposes during development.

c) **Parameter Formulas:**

1. Initialization:

- Population Size (N): Number of chromosomes in the initial population.

2. Genetic Operations:

a. Elitism:

- Elitism Ratio (ER): Percentage of fittest chromosomes preserved from the previous generation.

b. Selection:

- Selection Probability (SP): Probability of selecting a chromosome based on its fitness during the Roulette Wheel Selection.

c. Crossover:

- Crossover Rate (CR): Probability of crossover occurring between two selected chromosomes.

- Crossover Point (CP): Randomly chosen point for the Single Point Crossover, ensuring it doesn't intersect student group timetables.

d. Mutation:

- Mutation Rate (MR): Probability of mutation occurring on the more fit chromosome.

- Swap Mutation: Specific technique involving the exchange of two portions of the chromosome.

3. Sorting and Selection:

- No specific parameters, but it involves ordering chromosomes based on their fitness.

4. a Experiment 1:

ALGORITHM:

- First of all an initial generation of chromosomes is created randomly and their fitness value is analysed.

- New Generations are created after this. For each generation, it performs following basic operations:

    a. First of all preserve few fittest chromosomes from the previous generation as it is. This is called Elitism and is necessary to preserve desired characteristics in the coming generations .

    b. Randomly select a pair of chromosomes from the previous generation. Roulette wheel selection method has been used here in this project.

c. Perform crossover depending on the crossover rate which is pretty high usually. Here single point crossover has been used.

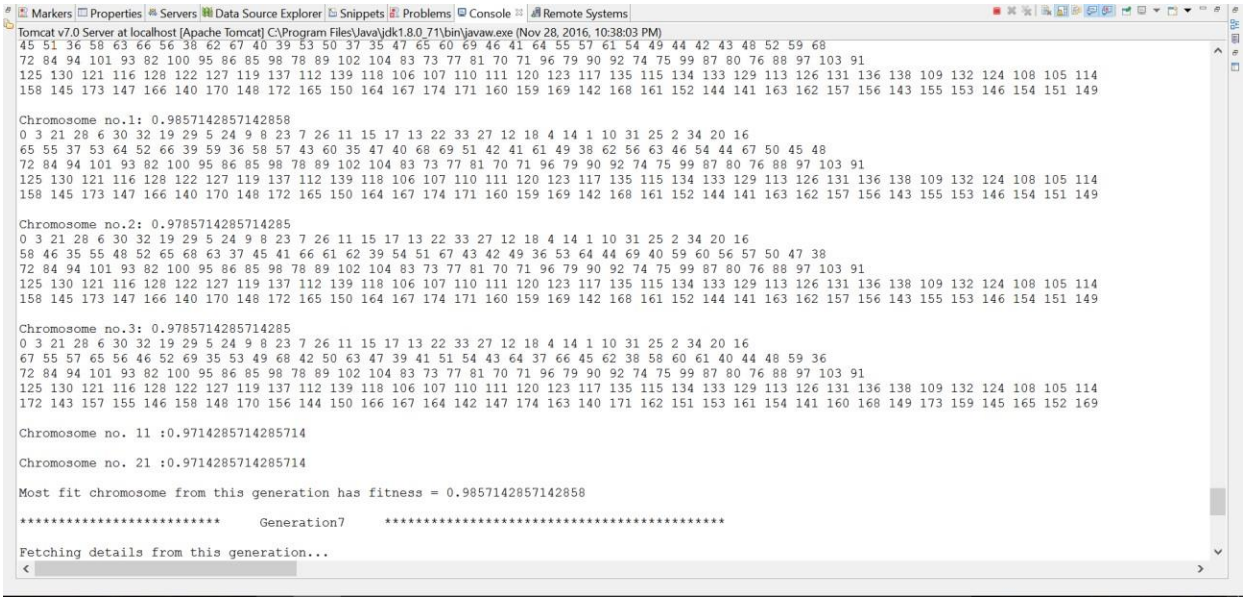
d. Perform mutation on the more fit chromosome so obtained depending on the mutation rate which is kept pretty small usually.

- Now analyze the fitness of the new generation of chromosomes and order them according to fitness values.

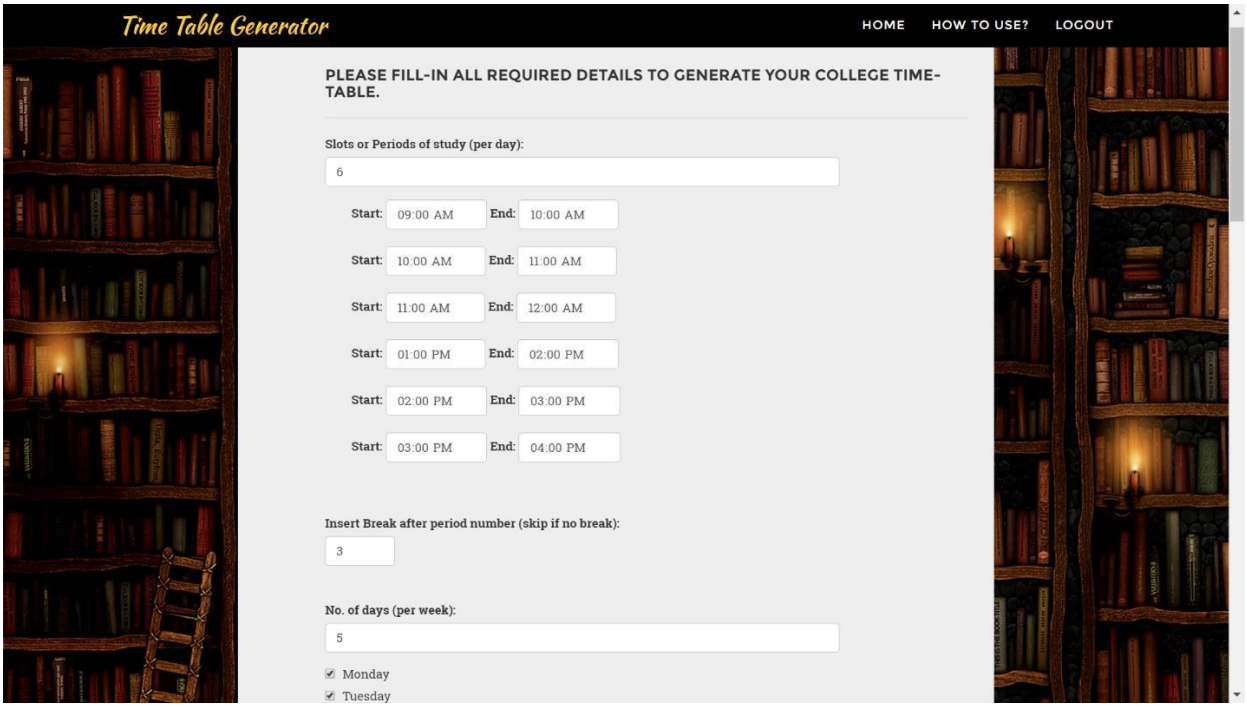
- Repeat creating new generations unless chromosomes of desired fitness value i.e. fitness=1, are obtained.

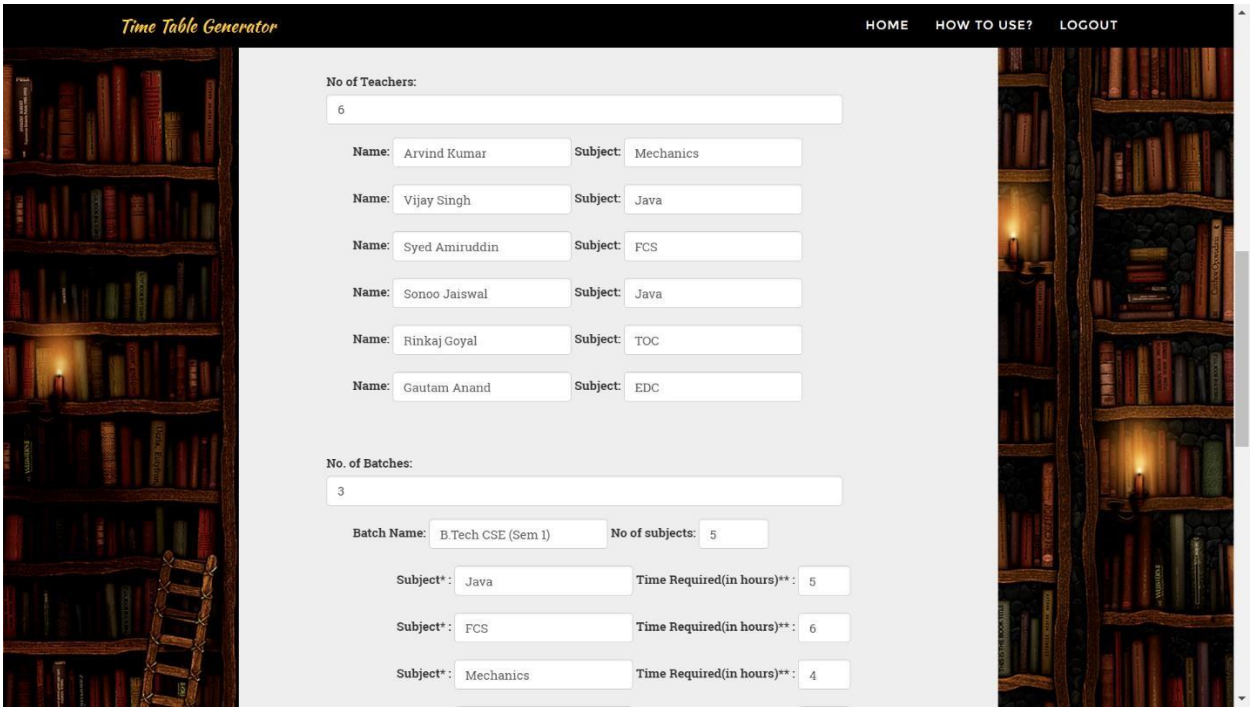
TESTING:

- For the ease of testing and tracking, a lot of information is printed on the console itself. It involves input information, slots generated, few chromosomes from each generation of chromosome, fitness of these chromosomes, maximum fitness in a generation and final selected chromosome.



- When tested with new input through the form for generation of time-table





FINDINGS:

The final output timetable:

B.TECH CSE (SEM 1)

	09:00-10:00	10:00-11:00	11:00-00:00	Break	13:00-14:00	14:00-15:00	15:00-16:00
Day 1	TOC Rinkaj Goyal	Mechanics Arvind Kumar	Java Vijay Singh		FCS Syed Amiruddin	FCS Syed Amiruddin	Java Vijay Singh
Day 2	EDC Gautam Anand	EDC Gautam Anand	EDC Gautam Anand				TOC Rinkaj Goyal
Day 3	Mechanics Arvind Kumar	EDC Gautam Anand	Java Vijay Singh		Java Vijay Singh	Java Vijay Singh	
Day 4	TOC Rinkaj Goyal	Mechanics Arvind Kumar	TOC Rinkaj Goyal		TOC Rinkaj Goyal	EDC Gautam Anand	FCS Syed Amiruddin
Day 5	FCS Syed Amiruddin	FCS Syed Amiruddin	EDC Gautam Anand		FCS Syed Amiruddin	Mechanics Arvind Kumar	

B.TECH ECE (SEM 1)

	09:00-10:00	10:00-11:00	11:00-00:00	Break	13:00-14:00	14:00-15:00	15:00-16:00
Day 1	FCS Syed Amiruddin	TOC Rinkaj Goyal	EDC Gautam Anand			EDC Gautam Anand	FCS Syed Amiruddin
Day 2		Java Sonoo Jaiswal	FCS Syed Amiruddin		EDC Gautam Anand	FCS Syed Amiruddin	
Day 3			Java Sonoo Jaiswal		TOC Rinkaj Goyal	Java Sonoo Jaiswal	EDC Gautam Anand
Day 4		Java Sonoo Jaiswal	FCS Syed Amiruddin		Java Sonoo Jaiswal	FCS Syed Amiruddin	
Day 5	EDC Gautam Anand	TOC Rinkaj Goyal	TOC Rinkaj Goyal		TOC Rinkaj Goyal	Java Sonoo Jaiswal	EDC Gautam Anand

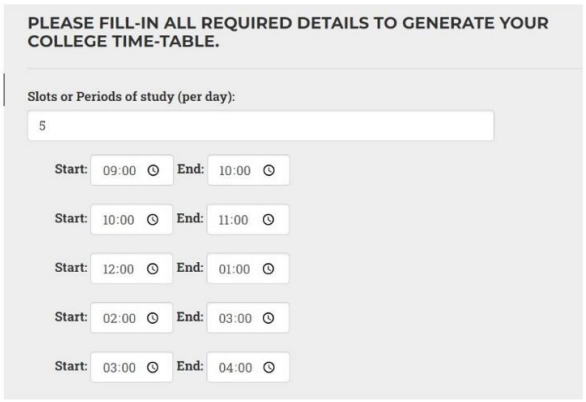
B.TECH IT (SEM 1)

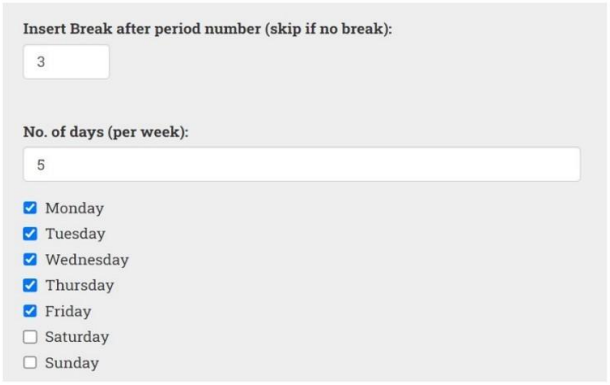
	09:00-10:00	10:00-11:00	11:00-00:00	Break	13:00-14:00	14:00-15:00	15:00-16:00
Day 1	EDC Gautam Anand	Java Vijay Singh	FCS Syed Amiruddin		EDC Gautam Anand	TOC Rinkaj Goyal	EDC Gautam Anand
Day 2	Java Vijay Singh	Mechanics Arvind Kumar	TOC Rinkaj Goyal		Java Vijay Singh	Java Vijay Singh	Java Vijay Singh
Day 3	TOC Rinkaj Goyal	FCS Syed Amiruddin	FCS Syed Amiruddin		EDC Gautam Anand	Mechanics Arvind Kumar	FCS Syed Amiruddin
Day 4	EDC Gautam Anand	EDC Gautam Anand	EDC Gautam Anand		FCS Syed Amiruddin	TOC Rinkaj Goyal	EDC Gautam Anand
Day 5	Mechanics Arvind Kumar	Mechanics Arvind Kumar	Mechanics Arvind Kumar		Mechanics Arvind Kumar	TOC Rinkaj Goyal	TOC Rinkaj Goyal

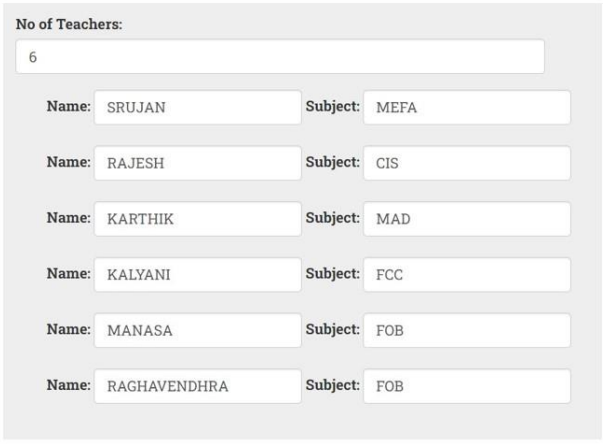
4. b Experiment 2:

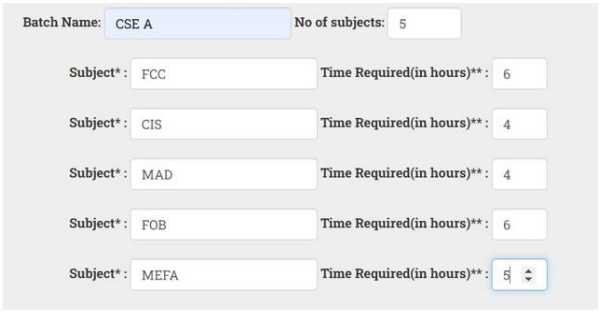
In the experiment described above, we observed that our model functions adequately with basic inputs. Now, let us examine its performance with inputs where multiple teachers teach the same subject and analyze the results.

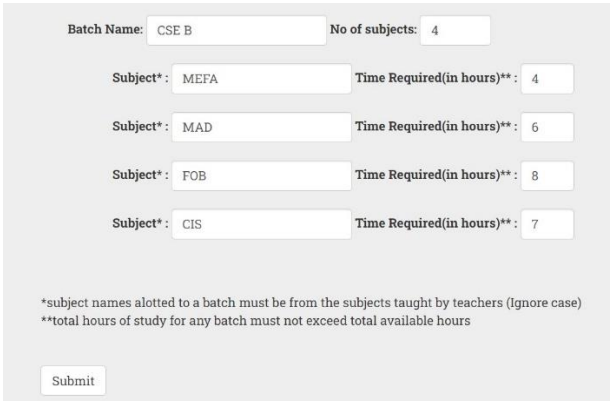
Input:











Findings:

In the input we have given 2 faculties for FOB, the algorithm gave the equal load for both the faculties as below.

CSE A

	09:00-10:00	10:00-11:00	12:00-01:00	Break	02:00-03:00	03:00-04:00
Day 1	FOB MANASA	CIS RAJESH	FOB MANASA		FCC KALYANI	FCC KALYANI
Day 2	CIS RAJESH	MAD KARTHIK	MEFA SRUJAN		CIS RAJESH	MAD KARTHIK
Day 3	FOB MANASA	FCC KALYANI	FCC KALYANI		CIS RAJESH	FOB MANASA
Day 4	FCC KALYANI	MAD KARTHIK	MEFA SRUJAN		FCC KALYANI	MEFA SRUJAN
Day 5	MEFA SRUJAN	FOB MANASA	FOB MANASA		MAD KARTHIK	MEFA SRUJAN

CSE B

	09:00-10:00	10:00-11:00	12:00-01:00	Break	02:00-03:00	03:00-04:00
Day 1	FOB RAGHAVENDHRA	FOB RAGHAVENDHRA	CIS RAJESH		FOB RAGHAVENDHRA	CIS RAJESH
Day 2	FOB RAGHAVENDHRA	FOB RAGHAVENDHRA	FOB RAGHAVENDHRA		MAD KARTHIK	MEFA SRUJAN
Day 3	FOB RAGHAVENDHRA	CIS RAJESH	CIS RAJESH		MAD KARTHIK	MAD KARTHIK
Day 4	MEFA SRUJAN	FOB RAGHAVENDHRA	MAD KARTHIK		MEFA SRUJAN	CIS RAJESH
Day 5	CIS RAJESH	MAD KARTHIK	MEFA SRUJAN		CIS RAJESH	MAD KARTHIK

5. Parameter comparison table

Parameter	Previous methods	Proposed method
Equal load to all faculties	Previous models used to fill the slots with the single faculty and if that faculty is busy, model will assign slot for other faculty.	In the proposed method, the model will consider all faculties for a same subject and allocates slots equally.
Selection of working days	There is no selection of number of working days.	User can select number of working days and also select the specific working days.
Break slot and periods	User cannot select break timings, number of slots and their timings	User can specify break timings and number of slots along with the timings for each slot.

6. Final Conclusion Statements

The process of Time Table generation has been fully automated with this software. This web app can now cater to multiple colleges, universities and schools which can rely on it for their Time Table scheduling which earlier had to be done by hand.

Signature Supervisor
Name: