National University
of computer and emerging sciences

Project#1 Report
Subject: Artificial Intelligence

Submitted To

Ma'am Labiba Fahad

Prepared By

Pawan Khetani

18I-0715

Faraz Ahmed

18I-0468

Section A

REPORT

Functions and classes used:

- CourseExam class:

This class holds the values required to define an exam. It contains course code, course name, room number, invigilator, students enrolled, date and time.

- Chromosome class:

This class holds a timetable and its fitness value

- create_time_Table func:

This function takes course code and name as constant and then randomizes the rest of the values to create a timetable.

- check_hard_constraints func:

This functions checks the validity of hard constraints being implemented.

- check_soft_constraints func:

This functions checks the validity of soft constraints being implemented.

- hard_constraint1 func:

This function checks if total number of courses is equal to courses in chromosome timetable.

- hard_constraint2 func:

This function checks if a student is enrolled in at least 3 courses and each student has one exam at a time

- hard_constraint3 func:

This function checks if exams are scheduled on weekends.

- hard_constraint4 func:

This function checks if exams are scheduled between 9AM-5PM.

- hard_constraint5 func:

This function checks if a teacher is invigilating only 1 exam at a time.

- hard_constraint6 func:

This function checks if a teacher has 2 exams in a row.

- check_fitness func:

This function checks the fitness of a chromosome.

- selection func:

This function selects 2 random numbers to be used for the crossover function.

- crossover func:

This function crosses 2 chromosomes by swapping their attributes which are selected through a randomizer and returns the child that results in the crossing.

- mutation func:

This function mutates the chromosomes that are passed to it.

- display_time_table func:

This function displays the time table passed to it.

Output:

Fitness being checked at every iteration.

```
3    print(new_population[i].fitness)
16
16
16
16
18
14
16
16
16
16
16
16
16
14
16
16
16
16
16
```

Display function displaying the result.

```
display_time_table(new_population[max_fitness])
```

Course Code	Course Name	Room	Invigilator	Date	Time
CS217	Object Oriented Programming	C306	Gul e Aisha	Monday3	AM 9:00 - 12:00
EE227	Digital Logic Design	C304	Sidra Khalid	Monday4	PM 2:00 - 5:00
CS211	Discrete Structures	C303	Naveed Ahmad	Wednesday1	AM 9:00 - 12:00
SE110	Intro to Software Engineering	C303	Irum Inayat	Friday2	AM 9:00 - 12:00
CS118	Programming Fundamentals	C305	Noreen Jamil	Friday1	AM 9:00 - 12:00
CS219	Database Systems	C305	Ejaz Ahmed	Tuesday4	PM 2:00 - 5:00
CS220	Operating Systems	C304	Farah Jabeen Awan	Monday2	PM 2:00 - 5:00
CS302	Design & Analysis of Algorithms	C301	Asif Naeem	Friday5	AM 9:00 - 12:00
CY2012	Digital Forensics	C302	Naveed Ahmad	Friday4	PM 2:00 - 5:00
CS307	Computer Networks	C308	Sehrish Hassan	Friday3	PM 2:00 - 5:00
CS328	Software Engineering	C308	Shafaq Riaz	Tuesday4	PM 2:00 - 5:00
EE229	Computer Organization and Assembly Language	C303	Kashif Munir	Tuesday2	AM 9:00 - 12:00
AI2011	Programming for AI	C307	Sadia Nauman	Friday4	AM 9:00 - 12:00
DS3011	Big Data Analytics	C307	Sidra Khalid	Friday4	AM 9:00 - 12:00
CS218	Data Structures	C304	Mehwish Hassan	Tuesday1	PM 2:00 - 5:00
MT224	Differential Equations	C308	Kashif Munir	Wednesday5	AM 9:00 - 12:00
SS113	Pakistan Studies	C303	Rohail Gulbaz	Tuesday2	AM 9:00 - 12:00
MG220	Marketing Management	C302	Irum Inayat	Thursday2	AM 9:00 - 12:00
MG223	Fundamentals of Management	C307	Usman Rashid	Friday4	PM 2:00 - 5:00
SS111	Islamic and Religious Studies	C302	Shoaib Mehboob	Monday1	AM 9:00 - 12:00
SS152	Communication & Presentation Skills	C301	Hammad Majeed	Monday5	PM 2:00 - 5:00
SS118	Psychology	C305	Ayesha Bano	Monday1	AM 9:00 - 12:00
MT205	Probability and Statistics	C307	Ameen Chilwan	Friday2	PM 2:00 - 5:00