GROUP# 11
Hetalben Virani (30183515)
Jahnavi Akuri (30180821)
Ayesha Singh (30194192)

SENG 696: Agent-based Software Engineering – Fall 2022

Online Abroad Consultancy

Project Overview

Steps towards Abroad studies:

i) Student registration.
ii) Data provided by the student is stored in the database.
iii) Successful student login after authentication.
iv) A query is made to list the universities based on student program.
v) Student can apply, bookmark, or compare the universities.
vi) Student can view the bookmarked universities in their profile.
vii) A query is made to compare the universities based on different criteria like ranking of the university based on course, fee structure, Alumni feedback etc.,
viii) Student can save and view the list of universities in their profile history.

Agents Outline:

i) Interface Agent – Connect to backend server.
ii) Gateway Agent – Handle HTTP Requests.
iii) Classifier Agent – Request to Search API to fetch data from DB.
iv) Compare Agent – Request to Compare API to compare data.
v) Bookmark Agent – Request to Save API, to store data into Local DB.

Technology Stack:

i) Frontend: JSP
ii) Backend: Core JAVA
iii) Database: MySQL || Local DB: User data Storage
iv) JADE-Agent Development Environment
v) Gaia- Agent Methodology

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System Requirements:

i) Frontend app will have a user-friendly GUI.

ii) Student would register into database.

iii) Student would be authenticated based on the data provided using HTTP API requests.

iv) Backend server must be capable of receiving, handling, and responding to API request from the app.

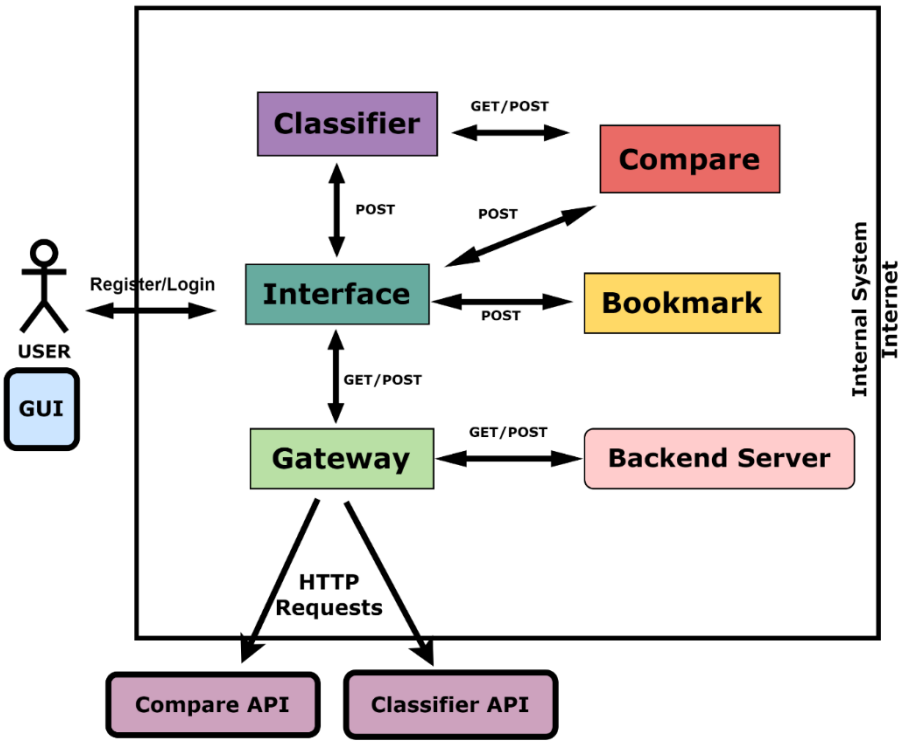
v) Upon receiving request, server will hand off processing to agents.

vi) System can store the user's information in Database (MySQL).

vii) System agents can expect inputs from users and display the result of list of universities by using search functionalities.

viii) Registered users can compare tuition fees, Duration of course of the universities.

ix) Users can save multiple universities and it would be displayed under the bookmarks.



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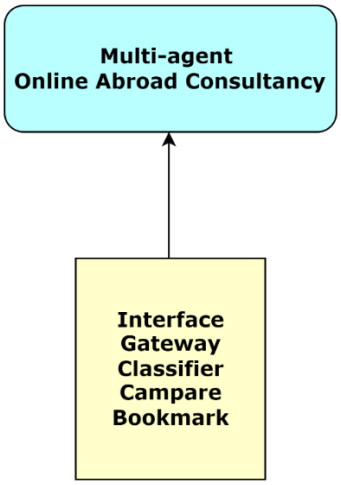
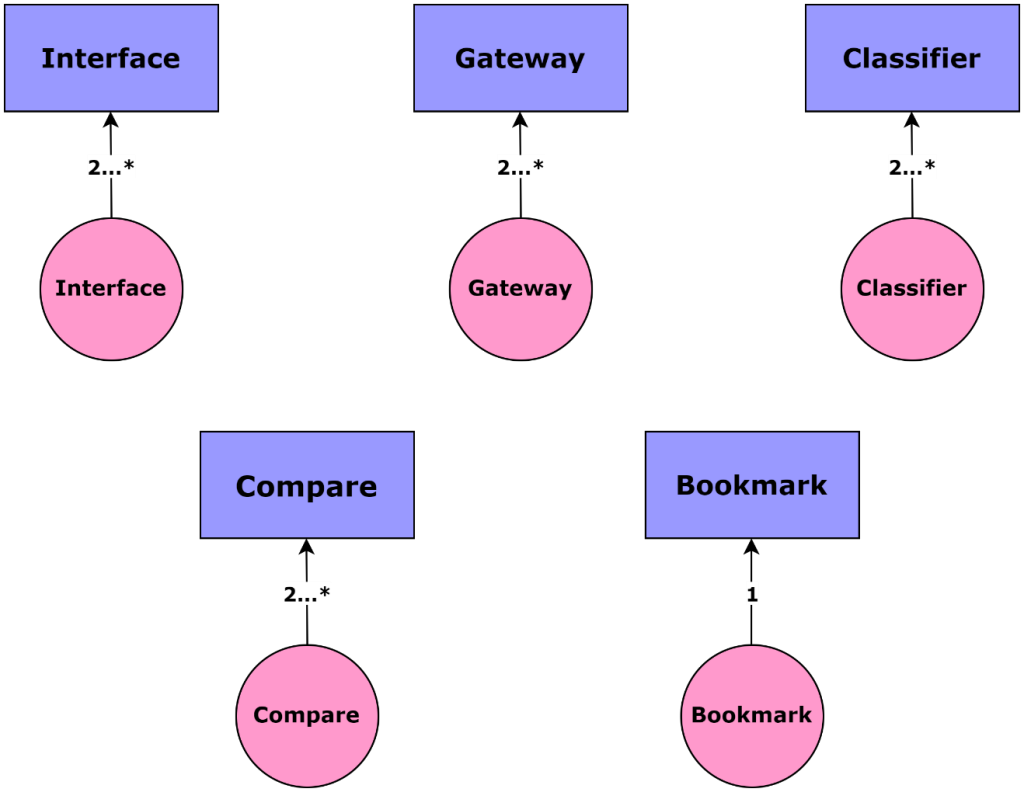
Analysis:

Role Model:



Agents Model:



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Role Schemas:

Role Schema	**Interface**
Description	To provide the user data and to receive the data after processing
Protocols and Activities	- Transfer user's data - Receive list of universities
Permissions	Read and write from Backend Server
Responsibilities	-Liveness: RequestService = (RequestService.SERVICE) - Safety:

Role Schema	**Gateway**
Description	Sends HTTP requests to Search API and Compare API, and returns the list of universities to the Classifier
Protocols and Activities	Query the Search API, Compare API, and Bookmark API as a GET method and request list of universities from classifier as a POST method
Permissions	HTTP Internet Access. Connect to Classifier, compare and bookmark agent
Responsibilities	-Liveness: Gateway Service = (GatewayService. SERVICE) -Safety: Secure connection with search and compare API

Role Schema	**Classifier**
Description	To receive the user's input via GUI and search for the list of universities based on user's data
Protocols and Activities	Request list of universities from Search API, as a POST method.
Permissions	Interface, Gateway, and Compare Agents
Responsibilities	-Liveness: DataClassifierService = (DataClassifierService.SERVICE) - Safety: Secure connection with Search API.

Role Schema	**Compare**
Description	To receive the list of universities text from classifier, request data from Compare API and send results back to Interface agent
Protocols and Activities	Query the Compare API, as a GET method.
Permissions	Connect to Classifier, Gateway and Interface Agents
Responsibilities	-Liveness: CompareDataService = (CompareDataService.SERVICE) -Safety: Secure connection with Compare API.

Role Schema	**Bookmark**
Description	To receive input from user and save the data into the local database for ease of future reference
Protocols and Activities	Query the bookmark API, as a POST method
Permissions	Connect to Classifier, Gateway and Interface Agents
Responsibilities	-Liveness: BookmarkDataService = (BookmarkDataService.SERVICE) -Safety: Secure connection with Classifier API.

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Interaction Model:

Protocol	Interface	Gateway	Classifier	Compare	Bookmark
Purpose/ Parameters	Provides a registered user detail. Sends and receives request to store and fetch data.	Acts as a middleman for Classifier and Interface agents when making HTTP requests	Receives user input, request data from database to and sends to the User based on search classification	Receives the Universities from Classifier, requests data from Search API, and sends Comparison back to interface	Acts as a local storage and display all the saved universities in user profile.
Initiator(s)	User and backend server	Interfac erequest	Search	Classifier	Bookmark Universities
Receiver(s)	Gateway	Classifier	Interface	Interface	Classifier Universities
Processing	Authenticated data Transfer to Gateway agent.	Request to fetch data and transmitted to the Classifier agent.	Returns JSON data from API calls to agents that requested it	Returns the result of the Comparison request back to the Interface Agent.	View list of Saved universities

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Services Model:

Services	Inputs	Output	Preconditions	Postconditions
Interface	User Data	List of University based on user input.	Users send data through GUI.	We can review the complete list of Universities.
Gateway	Handles HTTP requests.	Processing HTTP and sends response.	Fetch the HTTP'S request and sends it to the classifier agent.	Takes the output and sends it to the classifier.
Classifier	Receives data from database based on user input.	Returns Jason data.	Sends the base input to the gateway agent.	Returns the Jason and sends it to the comparison based on user request.
Compare	Receives input from classifier for comparison.	List of Universities after comparison.	Compares the data fetched from database based on user input.	Returns the comparison list to the user.
Bookmark	Receives the list of saved University.	List of saved Universities with easily accessible.	Receives the information of saved Universities from the database.	The easily accessible data is found handy at the front end of the app.

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Acquaintances Model: