BAHIR DAR UNIVERSITY

IOT

Computer Science and Engineering

Course: Artificial Intelligence (AI)

Design Document on Tour and Travel Guide Expert System

 Group Members Bekele Haile 069/2000

 Dawit Abrha 103/2000

Dawit Anegagrie105/2000

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# Introduction

This project is implemented in Prolog, which is a programming language for artificial intelligence. Our project will deal with tour and travel guidance expert system; it will focus on recommending a tourist where he/she should go for tour from the tour sites (cities) located in Ethiopia. This intelligent expert system will help the tourists on the first place, tourism bureau simplifying their advertisement and other jobs connected to them, the country will also be benefited from this system because this enough information availability will motivate the tourists to have a tour or travel somewhere by using their specifications they require to make schedules on their time and money and other resources.

This intelligent system affects the travel agencies, tourists, tourism office/ bureau and anyone who is willing in moving from one city to other cities. We are interested with the specific organizations like national tourism office, different travel agencies, city navigators, different cities as a starting city instead of using the capital city for the future.

There are major challenging issues in our area of interest that can be mentioned as the fluctuation of the travel cost of travel as the oil cost fluctuates, unexpected weather distortion can also be problem on tourists, on the way of collecting necessary data the reliabilities of the input data (data source) and distance imperfectness can be a problem too.

# Data Design

This portion of the document contains the data or the knowledge that is provided to the knowledge based expert system.

This system needs data to implement the facts and the rules to develop the expert system. These data includes:

City Name: name of the city with tour sights

Season: comfortable season at which the tour site would be best to tour on

Description: brief explanations about the city and its tour sites, reservations etc…

Travel cost: the cost required for transportation on car

Hotels and Reservations: hotels and reservations for the tourists

Distance: distance from the capital city to different cities of the country

Contact information: information describing whom to contact after a travel to the city or the tour site when the tourists are interested to drive by themselves.

Tour type: the tour may be historical sites, traditions and customs, holiday celebrations, museums, parks, natural land escapes and other tour sites.

Travel agency: an organization dealing with tourist guidance business

Path: refers to the city passed through passing to the destination city

# Facts and Rules

## Facts

* The region fact contains all the available tour palaces regions

region(afar,amhara,'benishangul gumuz',gambela,harari,oromiya,somali,snnp,tigray).

* The tour fact contains the city name, season, description, travel cost, hotel and reservation name, distance, contact information, tour type, travel agency and other data are included

tour('Dahir Dar',amhara,'all season','found at the middle of lake tana and abay',200,'summer land,ethio star',570,'travel agencies','Natural Land Escapes','Lake Tana, River Abay','NTO','Debre markos').

* The city fact contains the city name, tour site,

city(cityName,tourSite,season).

city(‘bahir dar’,’Laka tana’,’all season’).

city(‘bahir dar’,’River Abay’,’all season’).

* The reservationHotel fact contains the reservation and hotel name, description, tour site,

reservationHotel(cityName,reservationName,,tourSite,description)

reservation('Bahir dar','Summer Land’,amhara).

reservation('Bahir dar', ‘Ethio Star’,amhara).

reservation('Bahir dar', ‘Papyrus Hotel’,amhara).

* The travelAgency fact contains the travel agency name, contact information, branch number,

travelAgency(travelAgencyName,contactInfo,branch).

tour(Lalibela,'all season','Eighth Wonder of the World',\_,\_,'642KM',\_,'by plan and by car both possible',\_,amhara).

tour('Castles of Gondar and other monuments','all season','Bathing Palace of Emperor Fasilidas',\_,\_,'748KM',\_,'by plan and by car both possible',\_,gondar).

tour('Awash Lower Valley','all season','palaeontological and prehistoric sites',\_,\_,\_,\_,'by plan and by car both possible',\_,\_).

park('Simien Mountain National Park','all season','major highlands of Africa',\_,\_,\_,\_,'by plan and by car both possible',\_,gondar).

park('Awash National Park','all season','Awash National Park is one of the finest reserves in Ethiopia',\_,\_,\_,\_,'by plan and by car both possible',\_,afar).

citys(Bahir Dar,'River Abay, Lake Tana',Natural Land escape,amhara).

citys(Gondar,'Fasil Castle',Historic site,amhara).

citys(Mekele,'Atse Yohannis Castle',Historic sight,tigray).

holiday(Timket (Epiphany,jan/6).

holiday(Ethiopian Christmas,jan/7).

holiday(Mawlid al-Nabi (Birth of the Prophet),feb/4).

holiday(Victory of Adowa,mar/2 ).

The facts mentioned above are some of the facts with their data for the expert system development.

Keep in mind that the facts will contain the ID (identification) numbers by which some of the requested or needed categories are selected from the knowledge base facts available in the system.

## Rules

If city is inside a region

Then display the city under the region

If the city’s travel cost is minimum

Then the city with the minimum travel cost is displayed

If the city’s distance from the capital city is minimum

Then the city with a minimum distance is displayed

If the cities contain the same ID

Then all the available cities are displayed with their respective information

# User Interface Design

The system will display the “Start.” word to type on the prolog interface when the program is run.

Type the word and press “enter” key from the keyboard.

The menu list will be displayed.

The list will contain the following lists

* Enter 1 to search by region.
* Enter 1 to display available regions.
* Enter 2 to display all the cities available in a region.
* Enter 3 to display reservations available in a region.
* Enter 2 to search by city.
* Enter 1 to display all available cities.
* Enter 2 to display all the cities with available information.
* Enter 3 to display tour sights available in a city.
* Enter 4 to display reservations available in a city.
* Choose 3 display the cities and their tour site/s near to the capital city.
* Choose 4 display the city with the least travel cost.
* Choose 5 display tour site type(whether the tour is holiday celebration, natural land escape, historical places, sanctuaries and parks, historical places, museum or other type).This list will contain the a sub-list :
* Choose 1 to display all historical tour sites available with their information.
* Choose 2 to display the holiday celebration tour sites.
* Choose 3 to display all museum tour sites.
* Choose 4 to display all sanctuaries and parks tour sites.
* Choose 5 to display all natural land escape tour sites.
* Choose 6 to add some knowledge to the system.

Choose from the list and press “enter” key.

All lists will contain the option “Continue?” , type “y.” to continue or “n.” to abort and press the “enter” key.

*NB*. Don’t forget to add “.” after choosing a list and before pressing the “enter” key.

# Knowledge-Based System Design

A process which is applied to design and develop a knowledge-based system in this research is called knowledge engineering as shown in Figure 1. Knowledge engineer is a person who searches knowledge source, designs and selects development tools, develops, tests and adjusts the system before using in practical. The process of design system can describe in following:-

**User Menu**

This menu used for this expert system as user interface and let the users to choose different option.

**Inference Engine**

The inference engine is used for interactive work between database and the user option selection.

**Knowledge Acquisition**

Knowledge acquisition is a process of acquiring, organizing and studying knowledge. In this research, the knowledge is acquired from culture and tourist agency for testing system.

**Knowledge Base Design**

The production of rule-based knowledge system representation it consists of list of rule, facts.

#  Tour and Travel Guide Knowledge-Based System Architecture

The system contains 5 components which are user menu, inference engine, explanation module, knowledge acquisition unit, and knowledge base as shown below shown in Figure 1. This system is needed to support to manage the knowledge, such as creating and editing facts of cities and regions .Furthermore, it can explanation of facts .

USERS MENU

EXPLANATION MODULE

KNOWLEDGE ACQUISITION

knowledge base

User

 Figure1. Expert system structural overview

# Class Diagrams

UML class diagrams are the mainstay of object-oriented analysis and design. It show the classes of the system, their interrelationships (including inheritance, aggregation, and association), and the operations and attributes of the classes. Class diagrams are used for a wide variety of purposes, including both conceptual/domain modeling and detailed design modeling.  Thus, here is our expert system available class’s.



Figure 2. UML class diagram

# Conclusions and Recommendations

This tour and travel guide expert system intended to provide general information for those who want to travel different part of our country. The traveler may tourist, or any other visitor. So, this expert system assists those visitors where, and when to travel and it provides other necessary information. If this expert system fully implement, I hope that it alleviate a lots of works of culture and tourist agency.

We can conclude that this system is well defined and developed tour and travel guide expert system which mainly focus on the removing the problems of the tourists such as providing time saving guidance, providing cost saving guidance, providing reliable information and guidance, eliminate confusion and misguidance, Computerizing travel and tour guidance, information scarcity elimination and so many advantages are provided by the system.

It is recommended that if the tourists use this expert system they will be able to achieve on the management of their time, money, interest and fun, travel comfort and other advantages will be achieved by using the tour and travel expert system.