

**King Fahd University of Petroleum and Minerals**

**CRP 514 Geographic Information Systems (GIS)**

**Term project**



***Tourism Map of Seiyun City, Yemen***

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## Abstract

Nowadays, time is much more valuable as gold. Since time is used sensibly, easily access to a large deal of information is possible. People who want to go sightseeing in different places as tourists may want to have some information about those places before they are decide to go. Therefore, this project demonstrates the value of integrating tourism industry with Geographic Information Systems (GIS). Although it is implemented on a small scale, it is intended to highlight the need for standardization and automatic integration of the field as well as others that are fundamental such as facilities and utilities. In this paper, therefore, we are going to use GIS for building an instructive system of tourism in Seiyun City, Yemen. We will get started by choosing some features that end-user need such as famous landmarks, shopping places, restaurants, hotels and some facilities and entertainment location. These feature will implemented by add the location to the attributes to create complete design.

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## **Introduction**

Today, Tourism considers as one of the important industries in the world since it is being source of international income. It also enables people from different cultures and countries to interact with each other. Consequently, every country should advertise her history, architectural characteristics of buildings and local people culture in order to make them known globally <sup>[1]</sup>. Geographic Information System (GIS) technology provides us with these possibilities. GIS databases play essential role for tourism industry, where the tourism planning needs two types of geographical information: details on the location of facilities, and information on the spatial interrelations between them. Therefore, every country has to be conscious of tourism and make use of GIS directed towards tourism effectively. In this study, GIS design and analysis have been carried out by taking benefits of GIS possibilities for tourism industry.

## **1.0 Background**

Before we get started, we should to introduce some overall concepts about the main Purpose and Motivation of this project as well as the study area. The problem that the project should solve also is been introduced.

### **1.1 Geographic information systems**

Geographical Information System (GIS) is a system of hardware and software that supports the capture, management, manipulation, analysis, and display of Geographic Information <sup>[2]</sup>. The use of Geographical Information System (GIS) and the internet has changed the way of the organizations that use geographic information. GIS is expanding into new industries. Local governments, businesses, utilities, and higher education institutes are some examples of industries that have started to implement GIS in daily job routines. Utilities such as tourism evidence, water supply, and local area telecommunications are considered one side of these application areas <sup>[3]</sup>.

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A Geographical information system (GIS) is a powerful tool for better getting the information and fast access to the tourism map of Seiyun city. In GIS environment, there are two types of common data that should be taken into account, spatial data and non-spatial data. Spatial data provides information about the feature referred to geometrical orientation, size, and relative position from other features. None-spatial data is complementary information to spatial data, which provides some further information. A GIS is most often associated with a map view. A map, however, is only one of the following three ways you work with geographic data in a GIS.

## **1.2 Application of GIS in Tourism**

The Hadramout Valley in Yemen is the biggest of its kind in the Arabian Peninsula. Although not well known tourist destination, it has many interesting features. Especially, Seiyun is known for the numerous palms trees in the area, historical palaces, castles, tombs, shines and so on. Its inhabitants dwell in settlements concentrated on watering stations by the wadis. Here you will see people tending to dates, planting coffee and coconut groves. Bedouins tending goats and sheep are visible from the plateau. GIS is an important thing for the tourism. Especially, knowing the location of places is essentially objective for a tourist. GIS application like arc map plays a good role for looking for a hole information that a tourist needs.

## **1.3 The Study Area**

The largest city of the Wadi-Hdramout is called **Seiyun city** and it is the regional capital and main government, commercial and communications center<sup>[4]</sup>. It is situated between latitudes 15°54'N and 15°58' N and longitudes 48°45' E and 48°50'E, 520km away from Al Sana'a the capital of Yemen<sup>[5]</sup>. It is also known for the amazing palm groves which surround the city and for its old market at the center of the city where traditional crafts such as jewelry are still practiced<sup>[4]</sup>. The history of the city is going back thousands of years, probably owes its origin to the old trading market where important stopping place on the early trade route that ran east through Wadi-Masila and on to Shihr on the coast<sup>[4]</sup>.

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Figure (1). Tourism map of Hadhramout Governorate [2]

The city has a lot of landmarks, including the massive Sultan's Palace which was built in 1873 by Sultan Mansur bin Ghalib al Kathiri. It was also rebuilt and whitewashed in 1926 by the son of Sultan Mansur Ali [4]. Today it is a museum of archaeology with finds from Raybun, one of Yemen's most important ancient sites as well as exhibits on popular traditions, folklore and costumes. There are also Al-Falas castle which was built in 16th century as monitoring fort then changed to Prison for hundreds of years [4]. A lot of historical mosques and beautiful shrine was there in the city such as Al-Riyadh mosque and Al-Habshi shrine.

## 1.4 Problems Statement

Although, in the first place, the city is considered as big town with very old history, with amazing architectural characteristics of buildings and has lot of historical places and natural beauties, there is not tourism map advertises its history and local people culture. In addition, Google Earth program and website provide only the base map of the city as satellite pictures without any indication to the beauty of this city. A part from that, there is huge error in locations of the historical places Google earth provided in its site since its heavy dependent on the updation from the site's users.

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Finally, the GPS is too much costly in Yemen and mobile operators have not provided the service yet, so it too hard for tourists to get information about the location features and attributes of this locations without visiting the fact.

According to a pervious part, we are motivated to create the system that helps to improve the tourism industry to this city and share the history and culture of it to the people around the world. We have started form a scratch, step by step to build the system that is not help the foreign tourists, but all people who like to see the amazing places inside and outside Yemen.

## **2.0 Methodology**

In this part of the report, steps to produce the interactive tourism map of the Seiyun city using Geographic Information System (GIS) software are clarified. To do that, we need to do two steps. First, user-end survey is carried out by us, then design the database was discussed, and finally the creation of the system are studying.

Data are being used for this study are:

- The Administrative / Street Map (base map).
- Attribute Data collected on the ground as well as from historical and tourism websites.
- Data on the end-users

The administrative/street map was acquired from Local Administrative Department in Hadhramout Governorate. In addition, some of the attribute data were collected from ministry of tourism and heritage office website <sup>[4]</sup>. Using on-spot observation and personal interview, some attribute data and data on the end-users were acquired form Internet websites that serve the heritage and tourism of Yemen.

Some Software packages were used for data processing and creation. Such packages include: AutoCAD for editing the features (polygon and polyline) to create the tourism map and making geo-referencing. ArcInfo 10 was used for GIS overlay operation and analysis of spatial and spatial queries.

## **2.1 User-Requirement Survey**

User-requirement survey is not actual survey but it is a search on the literature, especially tourism sector, determines actually what the end-users (tourists and

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visitors) would want the system to do for them. From the research carried out, the types of data to carry out the work were known. It also guided in knowing the configuration of the software packages required to do this work as well as helped to know the further update should be carried out.

## **2.2 Design of Database**

In the design of database, two basic points should be taken into account, including articulation of reality, translation of reality to conceptual model. <sup>[3]</sup> Therefore, by searching the pervious literature and knowing all the requirement of target system, the design of the database is being started with collecting the attributes of the features first, and then location of them. The source of the information is taken carefully to satisfy the realities issues, so most of the features attributes and locations are taken form the specialized department such as ministry of tourism and heritage office and official office of Hadhramout Governorate website. The whole map that was suggested has five separated layers. These include: locations of amazing historical places, restaurants, great mosques, beautiful shrines, high standard hotels and good facilities and entertainment. .

## **2.3 Built of Database**

The tourism map was created from scratch by AutoCAD and ArcGIS programs with great help of Google earth program and tourism maps given from ministry of tourism and heritage office in Seiyun city.

To create the map, we did the following procedures:

- Getting features location using Google earth with acknowledge of the electable feature.
- Editing the features (polygon and polyline) of the map using AutoCAD software.
- Collecting the data that are related to this feature.
- Creating the Geodatabase for the data using ArcCatalog.
- Creating the layers (basemap, Restaurants, Mosques and shrines, Hotels, Historical places, and facilities and entertainment) of the map.



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- Adding an attribute table to each layer and managing it by using ArcCatalog.
- Displaying the map and getting information about map features using ArcMap.
- Analyzing the spatial and spatial queries to ease in-system searching.

The whole system, including base map is presented in figures (5,6,7&8).

### 3.0 Data Analysis and Presentation:

To start dealing with any software, there is main thing should be available. It is data base that all programs depending on it. For the tourism of Seiyun map project, the data is not founded easily. It needs big effort to collection. This project started from scratch, so the overlay operation was a file from AutoCAD program.

### 3.1 Overlay Operation

The base map of Seiyun city was as AutoCAD file. So, it needs to convert as a shape file to run with ArcGIS. This map consists of two main features: polygon and poly line. We use a polygon map to create the layers and poly line map as a base map. The layers are established by using the tools of ArcGIS software. These layers consist of five layers: restaurants, hotels, mosques and shrines, historical places and facilities and entertainment as shown in figure.2.

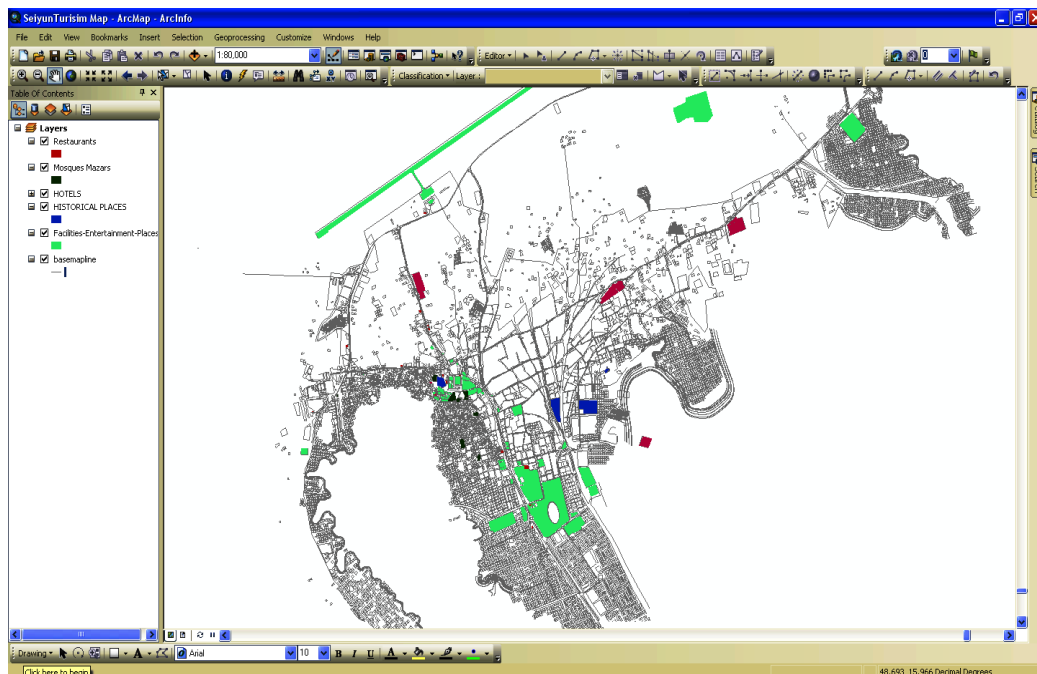


Figure .2.Layers of tourism map of Seiyun

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After creation the layers, the attributes is collected. The arc catalog program plays important role to do the attributes. The fields, names, ids and others are established. During this work, every layer needs attributes and need updated the data that we get it about Seiyun city. The layers with theirs attributes are shown in (figure .4& 5) as example.

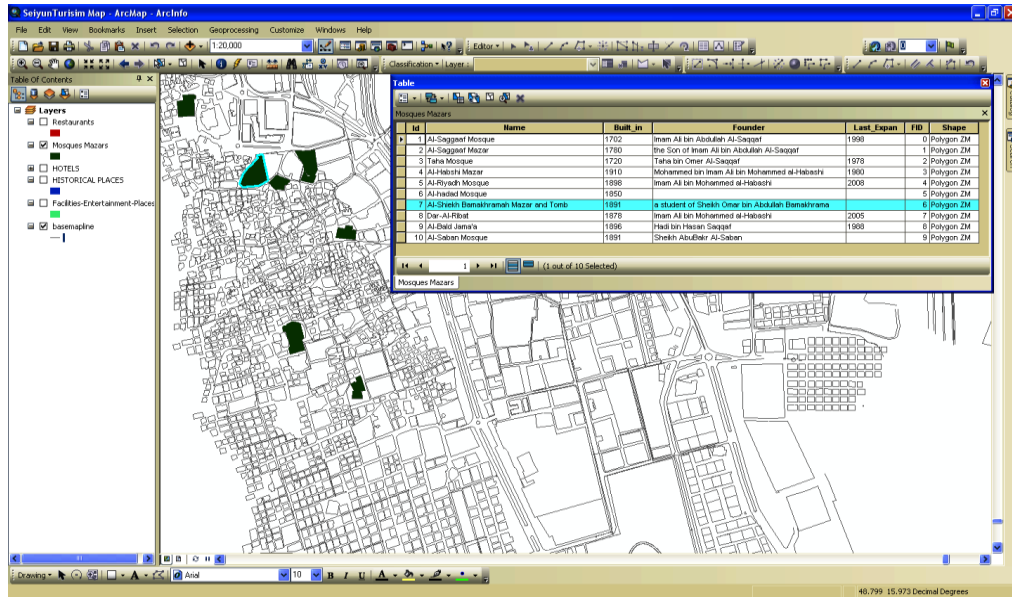


Figure .3.Layer with attributes

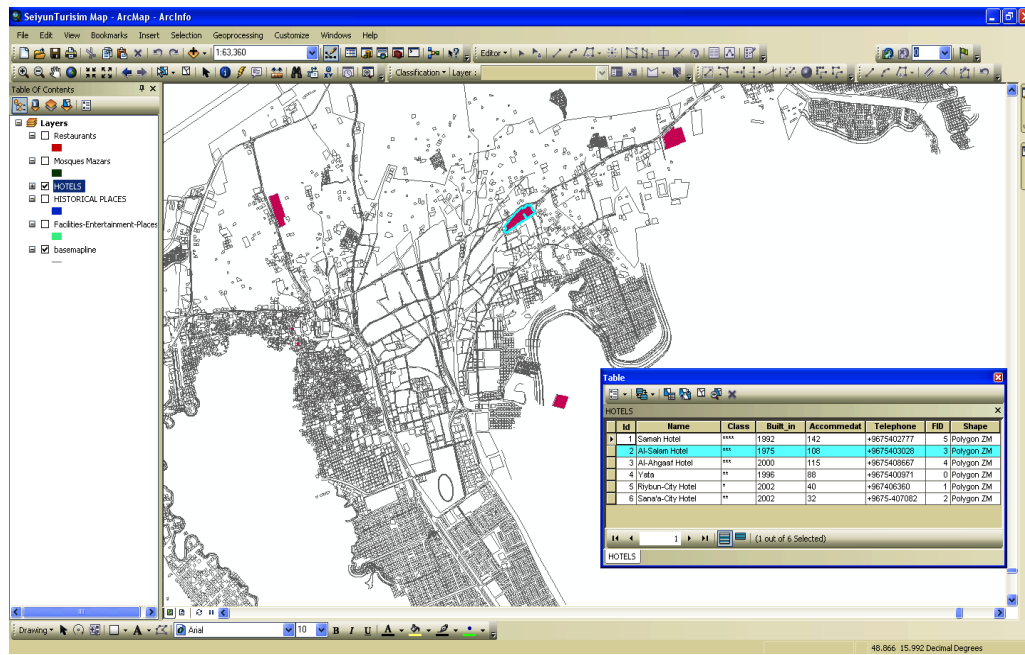


Figure .4. Another layer with attributes

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## 3.2 Spatial Query

The main objective of this project is how the tourist reaches to that place that he wants in limited time. Also, how he gets all information that he needs in specific place as ArcGIS application. In our project, we try to collect most things that a tourist need in one application. In this application a tourist can reach to anything he wants like hotels, airport, and shrines and so on in specific time. In spatial query, every user can research about any place (thing) he wants by writing the name of that thing and choose in which layer. These will achieved by property find in that application as shown in (figures 5,6 & 7) below.

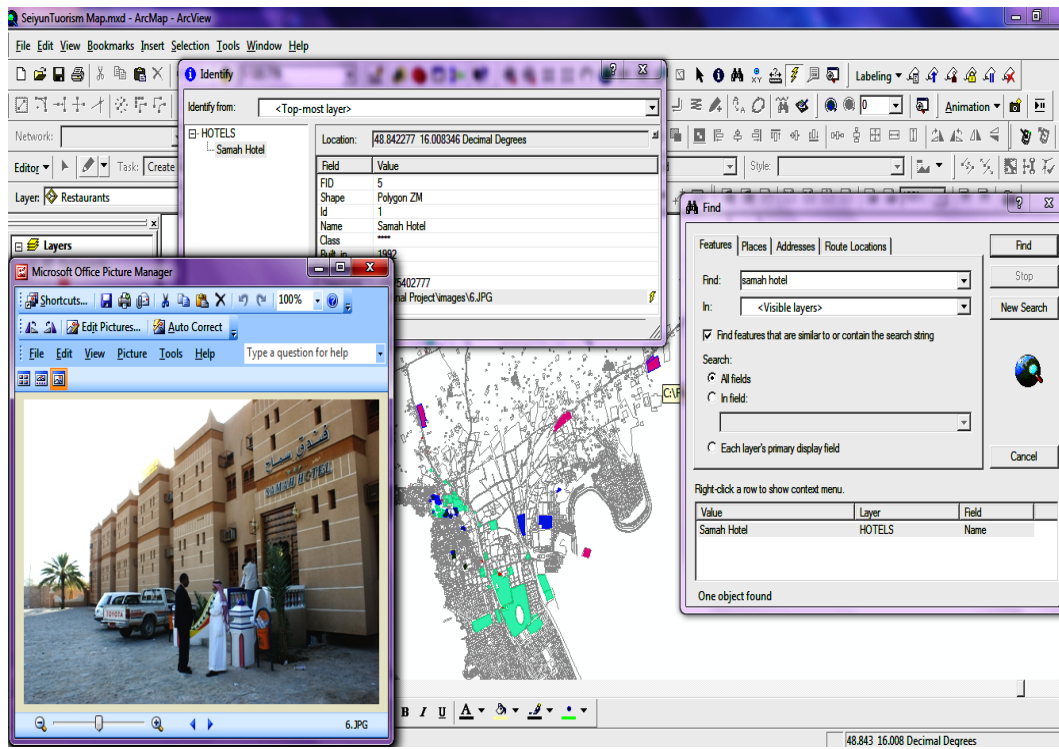


Figure .5. How to do spatial query

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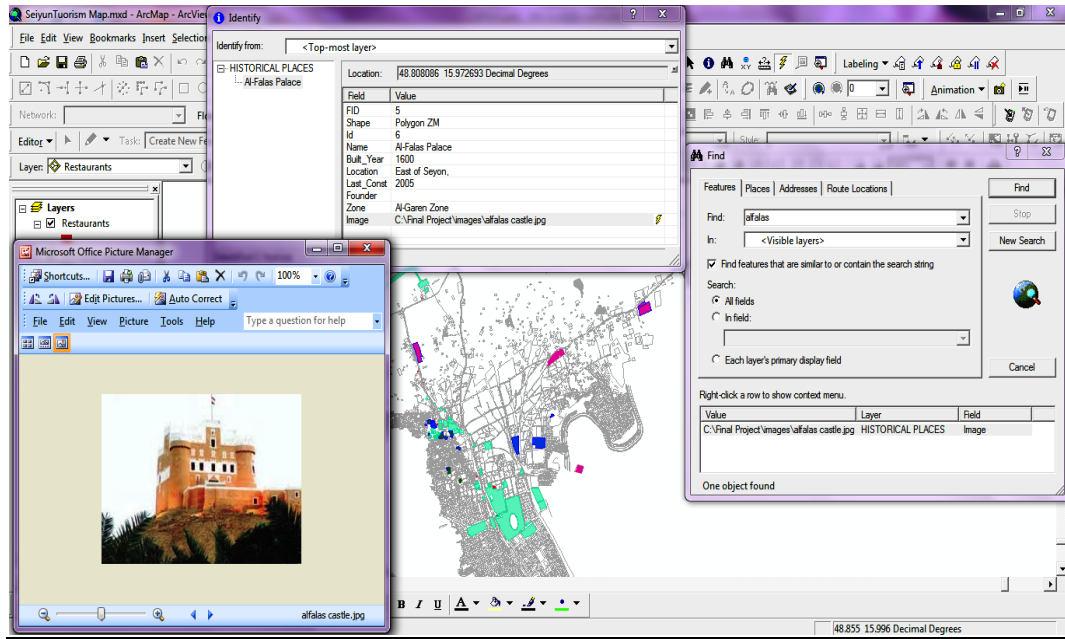


Figure .6. How to do spatial query

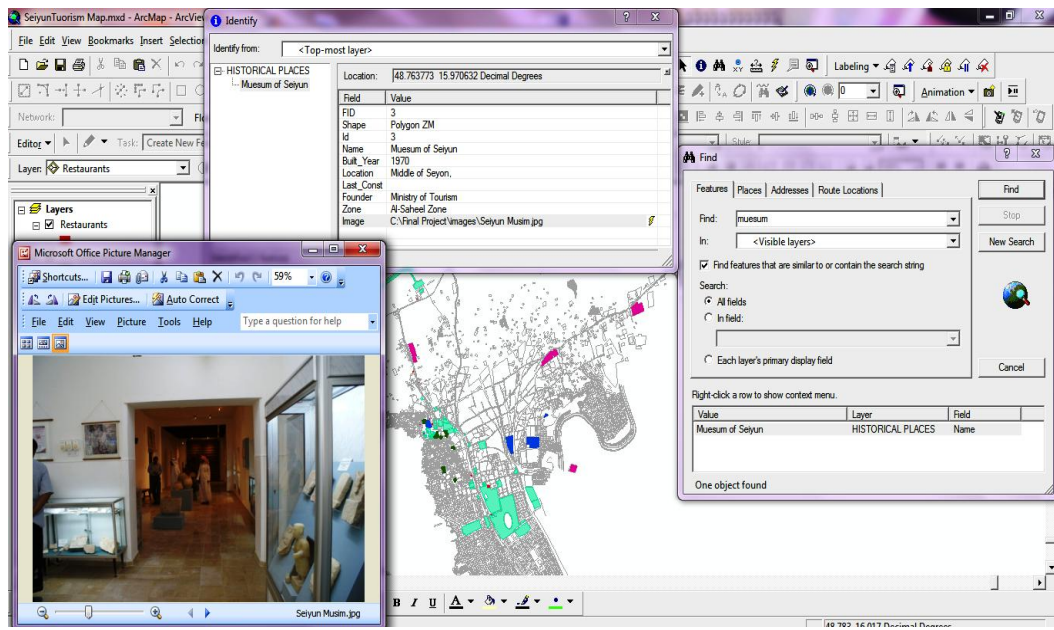


Figure .7. How to do spatial query

### 3.3 A Spatial Query

In this section the user can research about all things by choosing any word from a descriptive of that attribute. So, this service minimizes the time to get the information.

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This property is an important for the tourist. The figure.8 below showed how to work with this property.

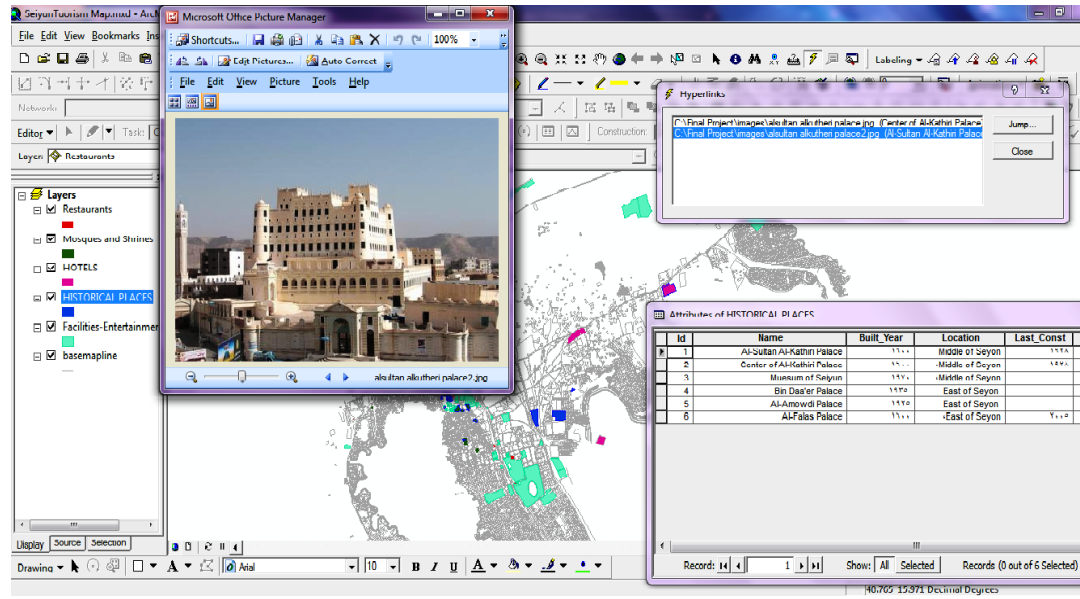


Figure .8. How to do aspatial query

## 4.0 Conclusions and Recommendation

This project presents general overview about Seiyun as a touristic city. The package of ARCGIS software is used for creation data base for all information that we could collect to improve the tourism in Seiyun especially. The main thing in this project which is how to deal with layers & attributes as a user are presented .Fast spatial query & a spatial query is presented. This project as application program of GIS system can be putted in hotels as idea for future work. Also, the application can be uploaded on the website. Finally, the area of this study could be increased to include the hadramoute village or whole hadramoute Governor.

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