Science Arena Publications
Specialty Journal of Psychology and Management
Available online at www.sciarena.com
2015, Vol, 1 (4): 70-78

Locating the Technical Examinations Center Using Genetic Algorithm Technique and Employing the Local Information (The Case of West Azerbaijan)

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Abstract: One of the reasons of lengthy queues formation in technical examination centers and inappropriate distribution of centers. Lack of enough support of centers and lack of some ability of such centers are the result of inappropriate establishment of such centers. Regarding the traffic criteria, the price of acre and population as the main criteria, this study presents a method for prioritizing the cities in order to localize automobile technical examination centers. The study was applied and descriptive in terms of goal and quality of data collection. It is applied in that the use of the obtained results can be applied to localizing the technical testing centers using genetic algorithm technique. Since the geographical scope of the study is restricted to West Azerbaijan, the data were collected through the information bank and satellite maps. The findings indicate that to determine the operant, 100 iterations were made and the target function had 41040.52 mean value and its mean solving time was 2.043 seconds.
Keywords: locating, technical examination centers, genetic algorithm, operant determination, placed-based information

Introduction

Regarding the economic development and population growth in Iranian context along with the scattering across cities, provinces, sectors and villages, one can demonstrate that using the transportation system aiming at observing the access safety, and considering the reduction level of pollutants and consumed energy are taken into account as important issues. The development of automobile industry, the notion of technical examination has been captured by much attention as set of rules, tests and implementation methods through these use of particular instruments for each test. 50 years has passed from the initial time of implementing the technical examination plan across developed countries. Throughout this time, technical examination of transportation systems has given rise to its position in traffic-based rules of different countries (Asgharpor, 2008).

What is important when it comes to make technical examination are identification and making analysis on affective factors pertinent to locating the centers such as the access, support, and public satisfaction. In this line, study plans for locating, establishing and technical tests of automobile technical examination have been conducted in an attempt to identify and determine the effective factors dealing with locating, choosing the rules and requires standards for management, implementing technical test and rejecting or accepting the four-wheel cars, high-chasse cars and motorcycles from the perspectives of increasing safety coefficient ad reducing environmental pollutants.

Review of literature

Locating an economic activity such as a retail state, factory, service-providing centers is one of the important questions faced by the enterprise and this can be the determining factor of success or failure since every enterprise has its own influence which absorbs its customers within that area. This area is now as the service-based or commercial area. On should notice that this area is restricted buy the distance and limited influential area, in case the chosen place for the enterprise is in a way that there are plenty of customers within that area, the enterprise is said to experience success (Akbarpor et al., 2015).

There are different factors which affect the locating of automobile technical examination centers such as population, type of access, rice of area, level of support, and etc., all of which are directly and indirectly influenced. Safety is a necessity which should be involved in cars till the last moments. The accidents and financial as well as human damages have coerced the traffic officials to design methods for examining the safety of automobiles. Thus, technical examination was introduced which concentrated on using particular instruments involving set of rules, test and implementation methods. Regarding the financial resources shortage, it is hardly possible to develop an algorithm to devote the resources and prioritize the establishment of these centers across cities and provinces. Having determined the polluting criteria of cities, the study suggests main criteria for prioritizing the cities in order to locate automobile technical examination centers (Araste, Bozorgiamiri & Jabalamoli, 2015).

The genetic algorithm is inspired by the genetic science and Darwinism which is based on the preserving of bests or natural choosing. One of the common uses of genetic algorithm is the optimizer. The genetic algorithm is counted as a useful instrument in restructuring the paradigm, choosing the attribute, perceiving the image and machine-based learning. In genetic algorithms, the quality of genetic revolution is simulated. In each level of implementing genetic algorithm, s set of plots are randomly assigned. The procedure goes as follows. Each continuum is given a plot and genetic operant are entered not these operant. Later, the obtained continuums are decoded so that new plots are obtained. Finally, the probability of participation on the part of each plot is determined. One can consider the genetic algorithms as random optimizing method in that it moves toward the optimum plots. . Regarding the characteristics of genetic algorithm compared to other types of optimization methods, one can say that it is an algorithm which is practicable without the need to have types of information. The capability of this method is optimization, the traditional methods of which are not practicable or are not totally reliable.

genetic algorithm is the exploration technique in computer science in order to find out the proximate solution for optimizing and exploration. Genetic algorithm is a type of perfect algorithms whish make use of different biological techniques such as heritage and mutation. This algorithm is based on the choice of bests or natural choosing. Also, it is regarded as useful instrument in reconstructing the paradigm, choosing of characteristics, perceiving of image, and machine-based learning. The quality of genetic revolution is simulated in genetic-based algorithm (Golandi, 2009).

Optimum locating

Locating of centers means exploring appropriate place for new centers through considering the existing centers and restrictions so that it is established in well-known economic area and its competitiveness is regarded as one of the main goals (Boshkani Farahani, 2006, p.2).

Technical examination centers

Technical examination centers are developed as set of rules, test and implementation methods through the use of particular instruments for each test. These centers perform to issue the certification for automobiles in terms of technical health. Locating technical examination centers is the act of selecting optimum ways based on different parameters such as trip, time of trio, covered distance, expectation of examination, the value and amount of change in way, and combination of parameters.

Mathematical model

The mathematical model consists of defining a system assisted by the mathematical language and its indices. Modelling or mathematical modelling is defined as the effort for development. A mathematical modeling is applied in natural sciences such as physics, biology, geology, aerology, ad engineering sciences such as computer sickness, artificial intelligence and etc. Also, it has applications in social science such as sickness, psychology, sociology (Godsipor, 2005).

The concept of locating

Choosing the facilitate place means determining the geographical area for the operation dealing with enterprise. This process involves the identification, analysis, evaluation and choosing among different alternatives (Yong & Yo, 2008). Locating the centers means finding appropriate place for new centers through considering the existing centers and limitations so that it is established in most-known economic area. Choosing the place involves the selection of place for new centers which reduce the production cost and services by minimum. The ultimate decision is mad based on objective and intellectual evaluations (Mosavui, 2001).

Fundamental assumptions of locating

Many people have heard that three factors should be taken into account when purchasing a house. The factors include place, place, and place. Equal consideration of other conditions, a house which is located in the downtown is always categorized by rapid increase of cost ad better charging of capital.

Spatial behavior paradigm: it involves a set of behaviors which follow the facilitator based on common goal (Mehdipor & Mohamadi Mesgari, 2006).

Related studies

Akbarpr et al. (2015) compared the methods of locating related to rain-covered area using decision support system based on GIS in Southern Khorasan. Six criteria of raining, the slope of the basin, depth and soil texture, drainage and land use plain were used. The first method integrates different characters within the decision-making process. Second method acts based on the area capacity in producing water waste and social factors. The obtained results manifested that the area was categorized by four groups in terms of covering the rain. The comparison of methods indicated that in Birjand dessert, using the first method is preferable.

Araste et al. (2015) proposed that multifold locating of facilities and plots of transferring the injured people we nit comes to the crisis is the most important factor. As an example in case, the demand for offering ambulance is developed based on the sets of demand plots which requires a facilitating service such as the hospital. The injured people are transmitted on these centers via the helicopters. A new model was provided in the study to plan the combined integer and some transfer plots. The aim of the model was to minimum the total time of transferring the injured people and defining fines when they are not transferred. To show the efficiency of proposed model, the study focused on Tehran Zone 4. The results indicated that the proposed model was efficient and useful for real decisions-making processes.

Sinar and Ahiska (2010) emphasized that choosing he place is one of the important process of decision-making which requires the examination of different factors based on the missions and organizational strategies. The aim of study was to provide a supporting model to assist the bank for the best choosing and establishing the best place for bank in one of the southern cities of Turkey. The model involved 5 indexes and 20 subscales based on the missions and banking goals. TOPSIS method as followed in the probe to prioritize the alternatives.

Research questions

Main question

How is the appropriate place to establish technical examination centers thorough the use of genetic algorithm and place-based information determined in West Azerbaijan?

Secondary questions

What criteria are in relationship with choosing the best place for establishing technical examination centers across West Azerbaijan cities?

What is the best method to choose the best place for establishing technical examination centers across West Azerbaijan cities?

How is the genetic algorithm used in line with choosing the best place for establishing technical examination centers across West Azerbaijan cities?

Design of the study

The study is applied and descriptive in terms of goal and quality of data collection. The study was conducted in the first half year 2015. The stud concentrated on cities of West Azerbaijan as the geographical scope.

Table 1. Choosing the level of qualification

		level 1	level 2	level 3
	% Cross	77.16125813	77.16605903	77.08631383
Fitness	% Mut	77.09858901	77.16560811	77.14943388
	Popsize	77.16070734	77.10358967	77.149334
	Maxiter	77.13743539	77.10720062	77.16905709

The initial qualification value was 200 times iterated based on Tagochi test. The determined values were determined by the final comparison. The above-mentioned values were determined based on the local information and research findings along wit housing on determined model.

Table 2. Initial chromosome percent

	% Cross	-18.87399295	-18.8742632	-18.86977059	
S/N	% Mut	-18.87046178	-18.87423782	-18.87332714	
	Popsize	-18.87396195	-18.87074327	-18.87332151	
	Maxiter	-18.87265179	-18.870943	-18.87443194	

The initial chromosome value was 200 times iterated based on Tagochi test. The determined values were determined by the final comparison. The above-mentioned values were determined based on the local information and research findings along with housing on determined model.

Table 3. Rate of optimality

	% Cross	0.218276036	0.119461338	0.254597254
RPD	% Mut	0.374470138	0.119461338	0.098403153
	Popsize	0.25160937	0.208988773	0.131736486
	Maxiter	0.402807194	0.122860768	0.066666667

The rate of optimality value was 200 times iterated based on Tagochi test. The determined values were determined by the final comparison. The above-mentioned values were determined based on the local information and research findings along with housing on determined model.

Initial population

To determine the number of initial population, Tagochi method and findings of the above table were used which yielded 0.5 value.

Table 4

level 1	level 2	level 3	
0.9	0.5	0.2	% Cross
0.1	0.5	0.8	% Mut
50	75	100	Popsize
50	75	100	Maxiter

The initial population value was 200 times iterated based on Tagochi test. The determined values were determined by the final comparison. The above-mentioned values were determined based on the local information and research findings along with housing on determined model.

Determining the iteration

To determine the iteration, Tagochi method and findings of the above table were used which yielded 0.5 value.

Table 6

level 1	level 2	level 3	
0.9	0.5	0.2	% Cross
0.1	0.5	0.8	% Mut
50	75	100	Popsize
50	75	100	Maxiter

The initial population value was 200 times iterated based on Tagochi test. The determined values were determined by the final comparison. The above-mentioned values were determined based on the local information and research findings along with housing on determined model.

Intersection percent

To determine the intersection percent, Tagochi method and findings of the above table were used which yielded 0.5 value.

Table 7

level 1	level 2	level 3	
0.9	0.5	0.2	% Cross
0.1	0.5	0.8	% Mut
50	75	100	Popsize
50	75	100	Maxiter

Mutation percent

The mutation percent was considered as 0.5.

Table8

level 1	level 2	level 3	
0.9	0.5	0.2	% Cross
0.1	0.5	0.8	% Mut
50	75	100	Popsize
50	75	100	Maxiter

According to the above table, the first iterations were initiated from 32 generation without the increase of qualification. No mutations was observed after the value and the improvement of qualification was not obtained due to the hindering condition.

Based on the results derived from the algorithm, it was found that the four-fold plots were chosen. The diagram presents the improvement degree. This value is based on the qualification basis in minimum time.

The above plot is the city entrance and the closest distance to Urmia Transportation Terminals. This is closer to the border area and commercial place where the high-chasse vehicles have access. It involves cost-effective areas and is consistent with municipality's restrictions. U-turns and highways are accessed. It is possible to access three points of city.

The above plot is the city entrance and the closest distance to Urmia Transportation Terminals. This is closer to the border area and commercial place where the four-wheel drivers have access. It involves cost-effective areas and is consistent with municipality's restrictions. U-turns and highways are accessed. It is possible to access three points of city.

Choosing the prone places

Table 9 Urmia

Iter = 1 BEST = 15.0465	Iter = 26 BEST = 18.9113	Iter = 51 BEST = 19.3245	Iter = 76 BEST = 19.3245
Iter = 2 BEST = 16.214	Iter = 27 BEST = 18.9113	Iter = 52 BEST = 19.3245	Iter = 77 BEST = 19.3245
Iter = 3 BEST = 16.214	Iter = 28 BEST = 18.9113	Iter = 53 BEST = 19.3245	Iter = 78 BEST = 19.3245
Iter = 4 BEST = 16.214	Iter = 29 BEST = 18.9113	Iter = 54 BEST = 19.3245	Iter = 79 BEST = 19.3245
Iter = 5 BEST = 16.9274	Iter = 30 BEST = 18.9113	Iter = 55 BEST = 19.3245	Iter = 80 BEST = 19.3245
Iter = 6 BEST = 17.0949	Iter = 31 BEST = 18.9113	Iter = 56 BEST = 19.3245	Iter = 81 BEST = 19.3245
Iter = 7 BEST = 17.0949	Iter = 32 BEST = 19.3245	Iter = 57 BEST = 19.3245	Iter = 82 BEST = 19.3245
Iter = 8 BEST = 17.3079	Iter = 33 BEST = 19.3245	Iter = 58 BEST = 19.3245	Iter = 83 BEST = 19.3245
Iter = 9 BEST = 17.3079	Iter = 34 BEST = 19.3245	Iter = 59 BEST = 19.3245	Iter = 84 BEST = 19.3245
Iter = 10 BEST = 18.2306	Iter = 35 BEST = 19.3245	Iter = 60 BEST = 19.3245	Iter = 85 BEST = 19.3245
Iter = 11 BEST = 18.2306	Iter = 36 BEST = 19.3245	Iter = 61 BEST = 19.3245	Iter = 86 BEST = 19.3245
Iter = 12 BEST = 18.2306	Iter = 37 BEST = 19.3245	Iter = 62 BEST = 19.3245	Iter = 87 BEST = 19.3245
Iter = 13 BEST = 18.2306	Iter = 38 BEST = 19.3245	Iter = 63 BEST = 19.3245	Iter = 88 BEST = 19.3245
Iter = 14 BEST = 18.727	Iter = 39 BEST = 19.3245	Iter = 64 BEST = 19.3245	Iter = 89 BEST = 19.3245
Iter = 15 BEST = 18.727	Iter = 40 BEST = 19.3245	Iter = 65 BEST = 19.3245	Iter = 90 BEST = 19.3245
Iter = 16 BEST = 18.727	Iter = 41 BEST = 19.3245	Iter = 66 BEST = 19.3245	Iter = 91 BEST = 19.3245
Iter = 17 BEST = 18.9113	Iter = 42 BEST = 19.3245	Iter = 67 BEST = 19.3245	Iter = 92 BEST = 19.3245
Iter = 18 BEST = 18.9113	Iter = 43 BEST = 19.3245	Iter = 68 BEST = 19.3245	Iter = 93 BEST = 19.3245
Iter = 19 BEST = 18.9113	Iter = 44 BEST = 19.3245	Iter = 69 BEST = 19.3245	Iter = 94 BEST = 19.3245
Iter = 20 BEST = 18.9113	Iter = 45 BEST = 19.3245	Iter = 70 BEST = 19.3245	Iter = 95 BEST = 19.3245
Iter = 21 BEST = 18.9113	Iter = 46 BEST = 19.3245	Iter = 71 BEST = 19.3245	Iter = 96 BEST = 19.3245

Table 10 Miandoab

Iter = 1 BEST = 15.3927	Iter = 26 BEST = 17.1391	Iter = 51 BEST = 17.1391	Iter = 76 BEST = 17.1391
Iter = 2 BEST = 15.3927	Iter = 27 BEST = 17.1391	Iter = 52 BEST = 17.1391	Iter = 77 BEST = 17.1391
Iter = 3 BEST = 15.3927	Iter = 28 BEST = 17.1391	Iter = 53 BEST = 17.1391	Iter = 78 BEST = 17.1391
Iter = 4 BEST = 16.3858	Iter = 29 BEST = 17.1391	Iter = 54 BEST = 17.1391	Iter = 79 BEST = 17.1391
Iter = 5 BEST = 16.3858	Iter = 30 BEST = 17.1391	Iter = 55 BEST = 17.1391	Iter = 80 BEST = 17.1391
Iter = 6 BEST = 16.3858	Iter = 31 BEST = 17.1391	Iter = 56 BEST = 17.1391	Iter = 81 BEST = 17.1391
Iter = 7 BEST = 16.3858	Iter = 32 BEST = 17.1391	Iter = 57 BEST = 17.1391	Iter = 82 BEST = 17.1391
Iter = 8 BEST = 16.3858	Iter = 33 BEST = 17.1391	Iter = 58 BEST = 17.1391	Iter = 83 BEST = 17.1391
Iter = 9 BEST = 16.5263	Iter = 34 BEST = 17.1391	Iter = 59 BEST = 17.1391	Iter = 84 BEST = 17.1391
Iter = 10 BEST = 16.6066	Iter = 35 BEST = 17.1391	Iter = 60 BEST = 17.1391	Iter = 85 BEST = 17.1391
Iter = 11 BEST = 16.6066	Iter = 36 BEST = 17.1391	Iter = 61 BEST = 17.1391	Iter = 86 BEST = 17.1391
Iter = 12 BEST = 16.6066	Iter = 37 BEST = 17.1391	Iter = 62 BEST = 17.1391	Iter = 87 BEST = 17.1391
Iter = 13 BEST = 16.6066	Iter = 38 BEST = 17.1391	Iter = 63 BEST = 17.1391	Iter = 88 BEST = 17.1391
Iter = 14 BEST = 16.7943	Iter = 39 BEST = 17.1391	Iter = 64 BEST = 17.1391	Iter = 89 BEST = 17.1391
Iter = 15 BEST = 16.7943	Iter = 40 BEST = 17.1391	Iter = 65 BEST = 17.1391	Iter = 90 BEST = 17.1391
Iter = 16 BEST = 17.1391	Iter = 41 BEST = 17.1391	Iter = 66 BEST = 17.1391	Iter = 91 BEST = 17.1391
Iter = 17 BEST = 17.1391	Iter = 42 BEST = 17.1391	Iter = 67 BEST = 17.1391	Iter = 92 BEST = 17.1391
Iter = 18 BEST = 17.1391	Iter = 43 BEST = 17.1391	Iter = 68 BEST = 17.1391	Iter = 93 BEST = 17.1391
Iter = 19 BEST = 17.1391	Iter = 44 BEST = 17.1391	Iter = 69 BEST = 17.1391	Iter = 94 BEST = 17.1391
Iter = 20 BEST = 17.1391	Iter = 45 BEST = 17.1391	Iter = 70 BEST = 17.1391	Iter = 95 BEST = 17.1391
Iter = 21 BEST = 17.1391	Iter = 46 BEST = 17.1391	Iter = 71 BEST = 17.1391	Iter = 96 BEST = 17.1391

According to the above table, the first iterations were initiated from 16 generation without the increase of qualification. No mutations was observed after the value and the improvement of qualification was not obtained due to the hindering condition.

Based on the results derived from the algorithm, it was found that the four-fold plots were chosen. The diagram presents the improvement degree. This value is based on the qualification basis in minimum time.

Access to all parts of the city is the first characteristic of this place. The above plot is the city entrance and the closest distance to Urmia Transportation Terminals. It involves cost-effective areas where the four-wheel drive vehicles have access. It involves cost-effective areas and is consistent with municipality's restrictions. U-turns and highways are accessed. It is possible to access three points of city.

The above plots are well suited and the expansion was the main issue. These plots can be within the era of establishing technical examination centers. Access to the main ways is not achieved, but it is justified since the city is small.

The above plot is the city entrance and the closest distance to Urmia Transportation Terminals. This is the commercial place where the four-wheel drive vehicles have access. It involves cost-effective areas and is consistent with municipality's restrictions. U-turns and highways are accessed. It is possible to access three points of city and can be the best alternative.

Table 11 Mahabad

Iter = 1 BEST = 14.9122	Iter = 26 BEST = 16.5732	Iter = 51 BEST = 16.5732	Iter = 76 BEST = 16.5732
Iter = 2 BEST = 16.1679	Iter = 27 BEST = 16.5732	Iter = 52 BEST = 16.5732	Iter = 77 BEST = 16.5732
Iter = 3 BEST = 16.1679	Iter = 28 BEST = 16.5732	Iter = 53 BEST = 16.5732	Iter = 78 BEST = 16.5732
Iter = 4 BEST = 16.1679	Iter = 29 BEST = 16.5732	Iter = 54 BEST = 16.5732	Iter = 79 BEST = 16.5732
Iter = 5 BEST = 16.1679	Iter = 30 BEST = 16.5732	Iter = 55 BEST = 16.5732	Iter = 80 BEST = 16.5732
Iter = 6 BEST = 16.1679	Iter = 31 BEST = 16.5732	Iter = 56 BEST = 16.5732	Iter = 81 BEST = 16.5732
Iter = 7 BEST = 16.2741	Iter = 32 BEST = 16.5732	Iter = 57 BEST = 16.5732	Iter = 82 BEST = 16.5732
Iter = 8 BEST = 16.2741	Iter = 33 BEST = 16.5732	Iter = 58 BEST = 16.5732	Iter = 83 BEST = 16.5732
Iter = 9 BEST = 16.2741	Iter = 34 BEST = 16.5732	Iter = 59 BEST = 16.5732	Iter = 84 BEST = 16.5732
Iter = 10 BEST = 16.2741	Iter = 35 BEST = 16.5732	Iter = 60 BEST = 16.5732	Iter = 85 BEST = 16.5732
Iter = 11 BEST = 16.2741	Iter = 36 BEST = 16.5732	Iter = 61 BEST = 16.5732	Iter = 86 BEST = 16.5732
Iter = 12 BEST = 16.5053	Iter = 37 BEST = 16.5732	Iter = 62 BEST = 16.5732	Iter = 87 BEST = 16.5732
Iter = 13 BEST = 16.5053	Iter = 38 BEST = 16.5732	Iter = 63 BEST = 16.5732	Iter = 88 BEST = 16.5732
Iter = 14 BEST = 16.5053	Iter = 39 BEST = 16.5732	Iter = 64 BEST = 16.5732	Iter = 89 BEST = 16.5732
Iter = 15 BEST = 16.5053	Iter = 40 BEST = 16.5732	Iter = 65 BEST = 16.5732	Iter = 90 BEST = 16.5732
Iter = 16 BEST = 16.5053	Iter = 41 BEST = 16.5732	Iter = 66 BEST = 16.5732	Iter = 91 BEST = 16.5732
Iter = 17 BEST = 16.5732	Iter = 42 BEST = 16.5732	Iter = 67 BEST = 16.5732	Iter = 92 BEST = 16.5732
Iter = 18 BEST = 16.5732	Iter = 43 BEST = 16.5732	Iter = 68 BEST = 16.5732	Iter = 93 BEST = 16.5732
Iter = 19 BEST = 16.5732	Iter = 44 BEST = 16.5732	Iter = 69 BEST = 16.5732	Iter = 94 BEST = 16.5732
Iter = 20 BEST = 16.5732	Iter = 45 BEST = 16.5732	Iter = 70 BEST = 16.5732	Iter = 95 BEST = 16.5732
Iter = 21 BEST = 16.5732	Iter = 46 BEST = 16.5732	Iter = 71 BEST = 16.5732	Iter = 96 BEST = 16.5732

Table 12 Bokan

Iter = 1 BEST = 145.4239	Iter = 26 BEST = 149.1949	Iter = 51 BEST = 149.5946	Iter = 76 BEST = 149.5946
Iter = 2 BEST = 146.1741	Iter = 27 BEST = 149.3302	Iter = 52 BEST = 149.5946	Iter = 77 BEST = 149.5946
Iter = 3 BEST = 146.1741	Iter = 28 BEST = 149.3302	Iter = 53 BEST = 149.5946	Iter = 78 BEST = 149.5946
Iter = 4 BEST = 146.8798	Iter = 29 BEST = 149.3606	Iter = 54 BEST = 149.5946	Iter = 79 BEST = 149.5946
Iter = 5 BEST = 146.8798	Iter = 30 BEST = 149.4054	Iter = 55 BEST = 149.5946	Iter = 80 BEST = 149.5946
Iter = 6 BEST = 146.8798	Iter = 31 BEST = 149.4054	Iter = 56 BEST = 149.5946	Iter = 81 BEST = 149.5946
Iter = 7 BEST = 147.7116	Iter = 32 BEST = 149.4054	Iter = 57 BEST = 149.5946	Iter = 82 BEST = 149.5946
Iter = 8 BEST = 147.9609	Iter = 33 BEST = 149.442	Iter = 58 BEST = 149.5946	Iter = 83 BEST = 149.5946
Iter = 9 BEST = 147.9609	Iter = 34 BEST = 149.4711	Iter = 59 BEST = 149.5946	Iter = 84 BEST = 149.5946
Iter = 10 BEST = 148.162	Iter = 35 BEST = 149.5946	Iter = 60 BEST = 149.5946	Iter = 85 BEST = 149.5946
Iter = 11 BEST = 148.162	Iter = 36 BEST = 149.5946	Iter = 61 BEST = 149.5946	Iter = 86 BEST = 149.5946
Iter = 12 BEST = 148.4286	Iter = 37 BEST = 149.5946	Iter = 62 BEST = 149.5946	Iter = 87 BEST = 149.5946
Iter = 13 BEST = 148.546	Iter = 38 BEST = 149.5946	Iter = 63 BEST = 149.5946	Iter = 88 BEST = 149.5946
Iter = 14 BEST = 148.546	Iter = 39 BEST = 149.5946	Iter = 64 BEST = 149.5946	Iter = 89 BEST = 149.5946
Iter = 15 BEST = 148.546	Iter = 40 BEST = 149.5946	Iter = 65 BEST = 149.5946	Iter = 90 BEST = 149.5946
Iter = 16 BEST = 148.546	Iter = 41 BEST = 149.5946	Iter = 66 BEST = 149.5946	Iter = 91 BEST = 149.5946
Iter = 17 BEST = 148.5749	Iter = 42 BEST = 149.5946	Iter = 67 BEST = 149.5946	Iter = 92 BEST = 149.5946
Iter = 18 BEST = 148.9305	Iter = 43 BEST = 149.5946	Iter = 68 BEST = 149.5946	Iter = 93 BEST = 149.5946
Iter = 19 BEST = 148.9305	Iter = 44 BEST = 149.5946	Iter = 69 BEST = 149.5946	Iter = 94 BEST = 149.5946
Iter = 20 BEST = 148.9305	Iter = 45 BEST = 149.5946	Iter = 70 BEST = 149.5946	Iter = 95 BEST = 149.5946
Iter = 21 BEST = 148.9305	Iter = 46 BEST = 149.5946	Iter = 71 BEST = 149.5946	Iter = 96 BEST = 149.5946

According to the above table, the first iterations were initiated from 16 generation without the increase of qualification. No mutations was observed after the value and the improvement of qualification was not obtained due to the hindering condition.

Based on the results derived from the algorithm, it was found that the four-fold plots were chosen. The diagram presents the improvement degree. This value is based on the qualification basis in minimum time.

The above route is the city entrance and is selectable in terms of the access. Also, it involves areas with much more cost-effectiveness.

The plot is the closest route to the Terminal Center. This route have access to other places and is possible to be used as the center of technical examination.

The above place is not suitable for establishing technical examination center since it involves a center for four-wheel driver and a separate enter for high-chasse vehicles technical examination. Such an affair is normal in small cities and proves the validity of existing potential.

According to the above table, the first iterations were initiated from 35 generation without the increase of qualification. No mutations was observed after the value and the improvement of qualification was not obtained due to the hindering condition.

Based on the results derived from the algorithm, it was found that the four-fold plots were chosen. The diagram presents the improvement degree. This value is based on the qualification basis in minimum time.

The above route is the main entrance of city and is the connection between Shahindej and Miandoab. It involves cost-effective area and have access to other places of city.

The outlet route is toward Bane and Sagez. This route is so crowded and can enjoy the attraction potential of customers.

The above route is the selective point and enjoys cost-effective areas, but it is more restricted.

Table 13 Shahindej

Iter = 1 BEST = 23.6787	Iter = 26 BEST = 27.4566	Iter = 51 BEST = 27.4566	Iter = 76 BEST = 27.4566
Iter = 2 BEST = 24.5737	Iter = 27 BEST = 27.4566	Iter = 52 BEST = 27.4566	Iter = 77 BEST = 27.4566
Iter = 3 BEST = 24.8688	Iter = 28 BEST = 27.4566	Iter = 53 BEST = 27.4566	Iter = 78 BEST = 27.4566
Iter = 4 BEST = 25.4112	Iter = 29 BEST = 27.4566	Iter = 54 BEST = 27.4566	Iter = 79 BEST = 27.4566
Iter = 5 BEST = 25.6666	Iter = 30 BEST = 27.4566	Iter = 55 BEST = 27.4566	Iter = 80 BEST = 27.4566
Iter = 6 BEST = 26.4603	Iter = 31 BEST = 27.4566	Iter = 56 BEST = 27.4566	Iter = 81 BEST = 27.4566
Iter = 7 BEST = 26.4603	Iter = 32 BEST = 27.4566	Iter = 57 BEST = 27.4566	Iter = 82 BEST = 27.4566
Iter = 8 BEST = 26.4603	Iter = 33 BEST = 27.4566	Iter = 58 BEST = 27.4566	Iter = 83 BEST = 27.4566
Iter = 9 BEST = 27.1166	Iter = 34 BEST = 27.4566	Iter = 59 BEST = 27.4566	Iter = 84 BEST = 27.4566
Iter = 10 BEST = 27.1166	Iter = 35 BEST = 27.4566	Iter = 60 BEST = 27.4566	Iter = 85 BEST = 27.4566
Iter = 11 BEST = 27.1166	Iter = 36 BEST = 27.4566	Iter = 61 BEST = 27.4566	Iter = 86 BEST = 27.4566
Iter = 12 BEST = 27.1166	Iter = 37 BEST = 27.4566	Iter = 62 BEST = 27.4566	Iter = 87 BEST = 27.4566
Iter = 13 BEST = 27.1166	Iter = 38 BEST = 27.4566	Iter = 63 BEST = 27.4566	Iter = 88 BEST = 27.4566
Iter = 14 BEST = 27.1166	Iter = 39 BEST = 27.4566	Iter = 64 BEST = 27.4566	Iter = 89 BEST = 27.4566
Iter = 15 BEST = 27.1166	Iter = 40 BEST = 27.4566	Iter = 65 BEST = 27.4566	Iter = 90 BEST = 27.4566
Iter = 16 BEST = 27.4566	Iter = 41 BEST = 27.4566	Iter = 66 BEST = 27.4566	Iter = 91 BEST = 27.4566
Iter = 17 BEST = 27.4566	Iter = 42 BEST = 27.4566	Iter = 67 BEST = 27.4566	Iter = 92 BEST = 27.4566
Iter = 18 BEST = 27.4566	Iter = 43 BEST = 27.4566	Iter = 68 BEST = 27.4566	Iter = 93 BEST = 27.4566
Iter = 19 BEST = 27.4566	Iter = 44 BEST = 27.4566	Iter = 69 BEST = 27.4566	Iter = 94 BEST = 27.4566
Iter = 20 BEST = 27.4566	Iter = 45 BEST = 27.4566	Iter = 70 BEST = 27.4566	Iter = 95 BEST = 27.4566
Iter = 21 BEST = 27.4566	Iter = 46 BEST = 27.4566	Iter = 71 BEST = 27.4566	Iter = 96 BEST = 27.4566

According to the above table, the first iterations were initiated from 16 generation without the increase of qualification. No mutations was observed after the value and the improvement of qualification was not obtained due to the hindering condition.

Based on the results derived from the algorithm, it was found that the four-fold plots were chosen. The diagram presents the improvement degree. This value is based on the qualification basis in minimum time.

Access to main parts of city is the main attribute. It enjoys cost-effective areas and is consistent with restriction of municipality. U-turn, highways and access points are the other characteristics.

The outlet route is toward Bokan and is of great importance. The roe of this route is as the ring and connects Bokan to Sagze, access to main places is the other attribute. I has cost-effective areas and is consistent with municipality restrictions. U-turns and highways are the other characteristics.

Table 14 Nagade

Iter = 1 BEST = 27.7512	Iter = 26 BEST = 33.9698	Iter = 51 BEST = 34.3771	Iter = 76 BEST = 34.3771
Iter = 2 BEST = 27.7512	Iter = 27 BEST = 33.9698	Iter = 52 BEST = 34.3771	Iter = 77 BEST = 34.3771
Iter = 3 BEST = 27.857	Iter = 28 BEST = 34.1728	Iter = 53 BEST = 34.3771	Iter = 78 BEST = 34.3771
Iter = 4 BEST = 29.7123	Iter = 29 BEST = 34.1728	Iter = 54 BEST = 34.3771	Iter = 79 BEST = 34.3771
Iter = 5 BEST = 29.7123	Iter = 30 BEST = 34.1728	Iter = 55 BEST = 34.3771	Iter = 80 BEST = 34.3771
Iter = 6 BEST = 30.488	Iter = 31 BEST = 34.1728	Iter = 56 BEST = 34.3771	Iter = 81 BEST = 34.3771
Iter = 7 BEST = 30.488	Iter = 32 BEST = 34.1728	Iter = 57 BEST = 34.3771	Iter = 82 BEST = 34.3771
Iter = 8 BEST = 30.6697	Iter = 33 BEST = 34.1728	Iter = 58 BEST = 34.3771	Iter = 83 BEST = 34.3771
Iter = 9 BEST = 30.8132	Iter = 34 BEST = 34.2949	Iter = 59 BEST = 34.3771	Iter = 84 BEST = 34.3771
Iter = 10 BEST = 31.4408	Iter = 35 BEST = 34.2949	Iter = 60 BEST = 34.3771	Iter = 85 BEST = 34.3771
Iter = 11 BEST = 31.4408	Iter = 36 BEST = 34.2949	Iter = 61 BEST = 34.3771	Iter = 86 BEST = 34.3771
Iter = 12 BEST = 31.6932	Iter = 37 BEST = 34.3771	Iter = 62 BEST = 34.3771	Iter = 87 BEST = 34.3771
Iter = 13 BEST = 31.7755	Iter = 38 BEST = 34.3771	Iter = 63 BEST = 34.3771	Iter = 88 BEST = 34.3771
Iter = 14 BEST = 32.346	Iter = 39 BEST = 34.3771	Iter = 64 BEST = 34.3771	Iter = 89 BEST = 34.3771
Iter = 15 BEST = 32.3948	Iter = 40 BEST = 34.3771	Iter = 65 BEST = 34.3771	Iter = 90 BEST = 34.3771
Iter = 16 BEST = 32.3989	Iter = 41 BEST = 34.3771	Iter = 66 BEST = 34.3771	Iter = 91 BEST = 34.3771
Iter = 17 BEST = 32.6484	Iter = 42 BEST = 34.3771	Iter = 67 BEST = 34.3771	Iter = 92 BEST = 34.3771
Iter = 18 BEST = 33.2975	Iter = 43 BEST = 34.3771	Iter = 68 BEST = 34.3771	Iter = 93 BEST = 34.3771
Iter = 19 BEST = 33.2975	Iter = 44 BEST = 34.3771	Iter = 69 BEST = 34.3771	Iter = 94 BEST = 34.3771
Iter = 20 BEST = 33.2975	Iter = 45 BEST = 34.3771	Iter = 70 BEST = 34.3771	Iter = 95 BEST = 34.3771
Iter = 21 BEST = 33.5926	Iter = 46 BEST = 34.3771	Iter = 71 BEST = 34.3771	Iter = 96 BEST = 34.3771

According to the above table, the first iterations were initiated from 34 generation and no qualification was obtained after this level.

Based on the results derived from the algorithm, it was found that the four-fold plots were chosen. The diagram presents the improvement degree. This value is based on the qualification basis in minimum time.

This is of great importance which enjoys potential characteristics. The areas are much more expensive and one can classify it as appropriate place. Access and population are the outstanding features.

City has less outlets and it is the least important part. It is the only part that involves inexpensive areas.

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