Climatic Regionalization using multivariate statistical methods, 
Case study: Khorasan Razavi province

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Introduction
Climate is one of the important factors in human life. Now, The human for development of farming, urban and industrial central, increasing of nutrition resource and increasing of information about different climatic regional. Geographer and climatologist determining regional of climatic equal. The study about climate classification shown that climate classification have many method such as experimental, desciptional and classification quantity methods. But now, the application of statistical methods that really puts a lot of climatic factors, which are widely accepted. Khorasan province with an area of approximately 129 000 square kilometers, and it is the fourth of vast province of Iran that is have diverse topography and therefore the climate is diverse. Since, about of climatic classification on Khorasan by using multivariate statistical study has been done, therefore in this study has identified areas and also climatically isoelectric significant elements that have shaped the face of climate, are identified.

Materials and Methods
For climatic mapping in the area under study the 20 number variables from the 14 number stations inside and outside of the area under study have been used in the period between 1986-2005. In the next step, Krigeing method has been done for interpolation using ArcGIS software in the 15×15 kilometer pixels in dimension. We have used from 521×20 produced matrix in dimension as input for statistical analysis. By using factor analysis, the 4 number factors have been identified that explain 91 total percents of climatic behavior in the area under study.

Discussion
The use factor analysis with principle component method and varimax shown that 20 climate element of province can with its aoutcorolation to 4 factor. By using factor analysis, the 4 number factors have been identified that explain 91 total percents of climatic behavior in the area under study. These factors are given by thermal factor, atmospheric moisture, pressure and wind. Factor shows that the thermal loads operating variables, the average maximum temperature, mean annual temperature, mean minimum temperature, mean annual evaporation, and the number of sunny hours positive correlation with rainfall and humidity elements show an inverse relationship. Local dispersion of these factors shows that thermal factor is the main factor in the south, eastern and western edges of area under study. Investigation of variable moisture content shows that the dew point temperature, vapor pressure, mixing ratio, days of Thunder Days of cloud and moisture factors have the greatest weight on humidity factor. The second factor is dominant in the northern half of the study area. The third

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factor, with sea level pressure, humidity, days of Thunder and the family, solidarity with the families directly and inversely related to temperature shows. The pressure as a third factor affects the climate of province. The fourth factor represents the average wind speed and the number of operating days of thunder and wind and dust to dust is the medium that has been called windy-dusty factor. The third factor is dominant in the western north of the area under study and the fourth factor is dominant in the north and south. The most obvious climatic feature is the wind speed in this area.

**Results:**

Results showed that the climate of province, make from four main factors that explain 92% of the climate condition. These factors in order of importance are: the heat, humidity, pressure and wind. Spatial distribution of these factors indicate that the thermal operating margin in the south and east and west of the province is effective. The second factor is dominated in the northern half of province. Spatial distribution of the third factor mainly prevails in North West. Finally, the fourth factor in the Top End of northern and southern study area is the dominant climatic phenomena. Finally, Ward approach is used for climatic mapping in the 5 homogeneous classes as follow: 1) warm and Arid. 2) Semi Arid and warm. 3) Semi Arid and cold. 4) Mountainous and Cold. 5) Moderate Mashhad plain.

**Keywords:** Climatic Regionalization, Kriging Interpolation, Factor Analysis, Cluster Analysis, Khorasan Razavi province.