UDC 51-73 (043.2)

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AUTOMATIC COLLECTION AND SYSTEMATIZATION OF WEATHER CHARACTERISTICS

In the modern world, people form the environment of their existence themselves, but there are still things that can not be influenced by people. The weather is one of them. Although at first glance the weather seems to be unpredictable, the collection and systematization of weather characteristics allow us to draw conclusions about the climate – the long-term weather.

The complexity and ambiguity of connections in the climate system, the constant evolution of its components with different inertia is the cause of many of the climate change on the planet. Because under the same external conditions on Earth there may be several types of climate, the state of the climate system is determined not only by external influence, but also by the interaction between its constituents.

When it comes to weather forecasting, it is easy to be confused that predicting temperature, sun or rain is pretty simple. Nowadays the weather report in theory is even easier. However, we sometimes come across the situation when according to the forecast is the weather is warm, clear and sunny, but it is exactly the opposite outside the window.

The .NET application has been developed to collect weather characteristics such as temperature, pressure, cloudiness, wind speed and direction. These data are systematized and stored after collection.

Yahoo Weather API is used to get weather characteristics. For example, in order to obtain the weather characteristics for Kyiv, it is necessary to complete the following request:

select * from weather.forecast where woeid = 924938,

where WOEID is a unique 32-bit city identifier.

The program sends a GET request, receiving XML data in response. After processing the result, the data are added to the SQLite database. The information collected by the organization is accumulated by temperature, cloudiness, humidity, probability of precipitation and other parameters. Then, with the help of computer algorithms, the forecast for the definite locality is formed on their basis. The request for a server occurs twice a day in the morning and at night.

At the same time, the data provided by the service have several disadvantages. Their geographical error can be up to five kilometers, and the most meteorological stations are located at the distance from the urban centers – at airports and military bases. Therefore, large services like Yahoo Weather use the services of companies that provide a so-called hybrid or mixed weather forecast – compiled not only based on NWS (National Weather Service) materials, but also on the basis of their own technologies and algorithms.

Testing of the program was carried out using a remote virtual machine hosted on the Microsoft Azure platform. After 30 days of testing, no crash was found in the program.

The prospect of further research is the improvement of a pogromic product in order to increase the number of weather characteristics to determine the climate of the region more accurately.

The development of climatological research in the future is to be conducted in the following areas: studying the dynamics of climate in Ukraine under the influence of natural and anthropogenic factors; assessment of socio-economic and socio-environmental impacts of climate change; the development of scenarios of possible changes in the regional climate of Ukraine under the influence of global warming associated with anthropogenic increase of the atmospheric greenhouse effect; prognostic estimation of possible changes in the intensity and repetition of extreme weather phenomena associated with global warming, etc.

The collected data can be used in all areas that are closely related to the weather. First of all, it is agriculture, solar and wind power engineering, construction and others. Meteorological data are widely used in the design and operation of various structures, such as: buildings, airfields, railways, power lines, etc.

References:

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