SCRATCH PROGRAMMING LANGUAGE AND ITS APPLICATION

Baqoyev Ozod

Annotation

The trend towards increasing computer literacy and mastering technology from an early age has led to the fact that more and more parents want to teach their children the basics of programming from an early age. Creating websites or own projects in familiar development environments is unlikely to interest a 7-year-old child, and to solve this problem, in 2003, MIT appeared the first prototype of the Scratch language, specifically designed to teach elementary and middle school students the basics of creating their own games, animations and collaborative work on projects. The following article is devoted to the programming language Scratch and its application.

Key words: scratch, animation, sound, sensor, variable, project, programming.

Scratch was created as a continuation of the ideas of the Logo language and the Lego constructor. Scratch 1.4 was written in the Squeak language, Scratch 2.0 and 3.0 are online oriented. Scratch 2.0 has been rewritten in Flash and ActionScript. Scratch 3.0 (current version) is an improved version of Scratch 2.0 and is made in HTML5 using the WebGL engine, making it compatible with mobile devices and tablets. Scratch is being developed by a small team of kid-friendly programmers at MIT. The current version is Scratch 3.0, released in January 2019.

Scratch is a visual object-oriented programming environment. In it, students control sprite objects. For them, a graphical representation is specified, which can be imported from any image source, and an action script, which is made up of blocks according to the drag-and-drop principle. These blocks are of several types:

traffic
appearance
sound
pen (using turtle graphics)
control
sensors
operations
variables

The creators of Scratch developed it specifically for children 8-16 years old. However, 6-7 year olds who can read, count, and use a mouse can also create simple projects. The main age of community members is 8-18 years old.

Programming in Scratch is a lot of fun, so it's best to do it in groups, then the kids can immediately share their projects, discuss them, come up with plots together.

Scratch is ideal for use in extra lessons in elementary grades (in extended day groups). Children are very addicted to creating projects, due to which their behavior improves.

Scratch can be used in libraries equipped with computers. There, children can create projects about the heroes of the books they read, and work together.

Scratch is well suited for organizing circles of young programmers based on institutions of additional education.

When using Scratch at home, it is advisable to register on the site and place all projects there. The site has a large Russian-speaking community where children can find like-minded people, ask questions and discuss projects.

The most common use of Scratch is to teach programming to children in the form of cartoons or games. In addition to these applications, Scratch can be used for educational purposes and create illustrative materials for lessons not only in programming, but also in history, biology, physics and other subjects in the program. Since version 2.0, a sound editor function has been added, which expands the possibilities of working with different types of data.

Scratch is a visually oriented programming language for kids. There is an opinion that this is a childish language in order to just play “programming” and nothing worthwhile (serious) can be made from it.

When I first started teaching classes for children on Scratch, as a person with two higher technical educations, it seemed the same to me. However, after a while I had to change my mind. It turned out that even in this children's programming language, chips are hidden that can be seriously used even when teaching professional programming. I want to share with you my discoveries.
Here are some examples of projects created using the platform:

- Strategy The Castle
- Introduction to Color Theory Lesson
- Saturn Music Video
- Educational game about blood types.

Scratch is completely free to use both in the online version and in the offline editor. 2014 also saw the release of a version of Scratch for younger children called ScratchJr. This is a mobile app for Android and iOS where children control sprites in the same way, only in a more simplified form. Blocks do not use text, so kids can learn to code before they can read, and they can do a limited set of activities: simple sprite movements and working with sounds and images.

Scratch has become the basis for several other visual programming languages. The most famous of these is Snap!, whose main distinguishing features are the ability to create your own blocks and the use of first class objects, so this language can be used for teaching and older people. Scratch is also used to program the Arduino, making the process even easier.

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