

Session 6: Nim

To work out winning strategies for the game of Nim

Let's learn

Lots of games require the same sort of logical thinking that computer programming does. Just as computer games have rules, so do more traditional games such as Nim.

Let's do

1. Who would like to play against me to demonstrate the game?
2. Now practice playing Nim with a partner.

Rules of Nim

1. Each player needs 15 counters.
2. Players take turns.
3. The game starts with 7 counters in the top row, 5 in the middle row and 3 in the bottom row.
4. The aim is to take the last counter.
5. On each turn, a player can take any number of counters from one (and only one) row.
6. Each player must take at least one counter.

Let's learn

From playing Nim, what have you found?

Let's do

1. Work with a partner to try to work out what some of the winning moves are in Nim.
2. Can you see any patterns here?
3. How far were you thinking ahead with your moves?

Rules of Nim

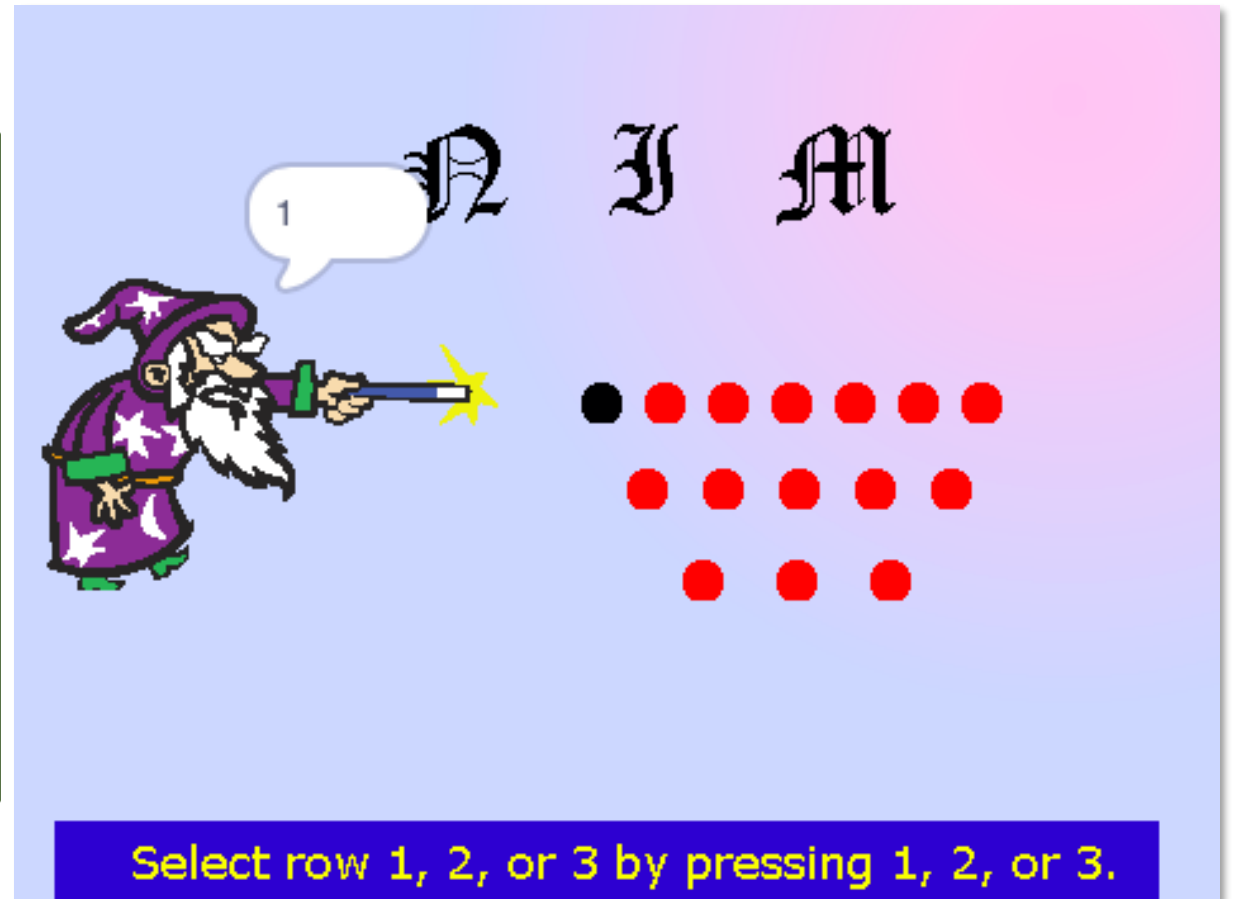
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Let's learn

Let's have a look at the Nim game in Scratch.

Let's do

1. Work with partners to see if you can beat the computer at Nim.
2. Can you work out how the computer plays Nim so well?
3. What rules is it following to make its moves?



Click the image to open game!

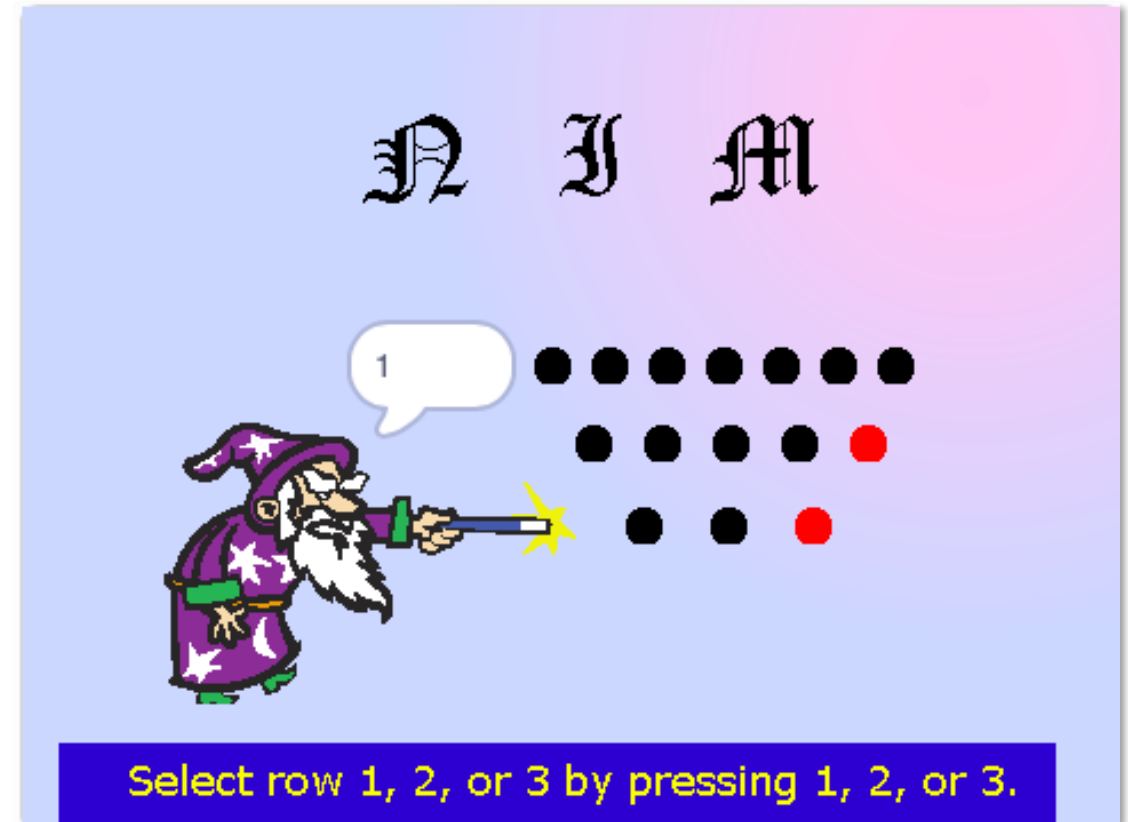
Let's learn

Computers have become very good at playing all sorts of strategy games like Nim. Computers can now beat (or at least not lose to) human players in lots of games.

Nim was one of the first games to be automated at the 1939 New York World's Fair. Even today, some of the most remarkable advances in computing come through creating programs to play games.

Let's review

1. What did we think of Nim?
2. Would we play it again?



Quiz time!

Do you know the answers to these questions?

There are six questions in total – click to see the answers in **bold**.

Question 1

What are the sets of rules used when programming a computer game?

- a) Inputs
- b) Algorithms
- c) Outputs

Question 2

What is the source code for a computer game?

- a) The instructions that the program follows
- b) The first part of the code
- c) The instruction manual for the person playing the game

Question 3

What is a graphical character in Scratch called?

- a) An avatar
- b) A pixie
- c) A sprite

Question 4

What is a program called that is made up of rules that are followed if something else happens: 'if this ... then ... that'?

- a) Source program
- b) Event-driven program
- c) Action-driven program

Question 5

What is making changes to an existing game's source code called?

- a) Debugging
- b) Processing
- c) Remixing

Question 6

What is the name of the age rating system for computer games?

- a) GEPI
- b) PEGI
- c) PIGE