

Practical sheet: AI and Games of Skill / Noughts and Crosses

- **Write a few sentences explaining:** Who was Charles Babbage? When did he live? What is he best known for? **Write a 1 paragraph summary** of Babbage's contribution to AI based on his short essay, "Games of skill (can be played by an automaton)". This can be found in *Passages from the Life a Philosopher*, (e.g. <https://archive.org/details/passagesfromlifo1babbgoog>) pp. 465-471, or, "Charles Babbage and his calculating engines : selected writings", Dover, 1961, pp. 152-157.
- Find a partner in your laboratory class and play 6 games of *Noughts and Crosses* (also known as *Tic-Tac-Toe*) against them. Alternate who starts the game. Record the number of wins, losses and draws you each make, noting the name of the person who started.



- Now, individually, clearly write an algorithm for winning *Noughts and Crosses*.

Face your partner again and *swap* algorithms. You must now play 6 games of *Noughts and Crosses* against them using *their* algorithm. You can check to make sure that the algorithm you have written is being followed accurately by your opponent. Alternate who starts the game. Record the number of wins, losses and draws you each make. You may improve your own algorithm after each game.

How did your algorithm go? Does it do as well as you did when playing? If not, how can it be improved?

- Log on to UNIX and implement your best algorithm for a human-player to compete against (You can just use a text-based user interface. There's no need for fancy graphics). Use the C++ programming language to write your code.

• Homework exercise 1

Complete your *Noughts and Crosses* software and see if you can beat it!