How to Beat the Computer at Chess

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After a long time in the doldrums, the strength of chess playing computer programs has increased enormously during the last decade. There are now at least half a dozen commercial programs which will play at International Master strength on a DX486 personal computer. In this article we look at the program GnuChess, from the Free Software Foundation, which is probably the most popular chess program which can be downloaded from the Internet. It can be obtained from the site //ftp.give.site//. GnuChess plays like a good club player and can beat almost all chess players who don't play seriously. Like all chess programs, however, it does have some weaknesses which we will explore here.

As a general rule, computers are better at chess tactics than they are at strategy. This is because they can accurately calculate concrete variations, but have difficulty thinking in general terms. For the same reason, they are better at speed chess than they are at the slower time controls used in serious tournaments.

Compared with humans, computers are less selective in the way that they calculate variations. Humans make occasional simple blunders but can calculate specific variations at great depth when the need arises. Computers have far more trouble deciding which variations are important and instead go for a blunderbuss approach, calculating all possibilities to a limited depth. One way to defeat a computer therefore is to present it with a tempting continuation which looks good in the short term but which is eventually to its disadvantage.

In the first example, GnuChess goes for a short term material gain which costs it a piece further down the track. The position is Diagram 1 arises from the Scotch Gambit opening after the moves 1. e4, e5; 2. Nf3, Nc6; 3. d4, ed; 4. Bc4, Bb5+; 5. c3, dc; 6. Nc3, Bc3+; 7. bc.

1. Black (GnuChess) to play

BR		BB	BQ	BK		BN	BR
BP	BP	BP	BP		BP	BP	BP
		BN					
		WB		WP			
		WP			WN		
WP					WP	WP	WP
WR		WB	WQ	WK			WR

White (human)

Black's best move now is 7. .... d6; preventing the advance of white's central Pawn and opening the way for Black's white-squared Bishop. Instead GnuChess goes for an immediate attack on white's Pawn with 7. .... Nf6. There follows 8. e5, Qe7; 9. O-O ! . White sees that if Black captures the e-Pawn then white Rook can pin the black Queen to its King, but GnuChess sees only the immediate gain of a pawn: 9. .... Ne5 ? ; 10. Ne5, Qe5; 11. Re1, Ne4; 12. f3, Qc5+; 13. Qd4, O-O; 14. fe, and White will win with the extra piece. Notice that the black Knight was not actually lost until five moves after Black's 9. .... Ne5; and seven moves after Black's 7. .... Nf6. This proved to be beyond GnuChess's depth of calculation, and therefore the future loss was not foreseen at the time of capturing the pawn . The human on the other hand sees without the need for detailed calculation that the pin on the e-file will eventually win material.

A similar example occurs in the Morra Gambit, after the moves 1. e4, c5; 2. d4, cd; 3. c3, dc; 4. Nc3, Nc6; 5. Nf3. Black should now play 5. .... d6; or 5. .... e6; but GnuChess instead plays 5. .... Nf6; 6. e5, Ng4; 7. Bf4, Qc7; (Diagram 2).

2. Black (GnuChess)

BR		BB		BK	BB		BR
BP	BP	BQ	BP	BP	BP	BP	BP
		BN					
				WP			
					WB	BN	
		WP			WN		
WP	WP				WP	WP	WP
WR			WQ	WK	WB		WR

White (human) to play

Black repeatedly attacks the white pawn on e5, but White sees that the black Knights, if they capture the pawn, will be pinned to the Queen by the white Bishop. White plays 8. Qd2 !, Nce5; 9. Ne5, Ne5; 10. Nb4 !. The point of 8. Qd2 is that Black cannot now play 8. .... Qa5+; and instead is forced to retreat the Queen. Despite being two pawns down, White has an easily won game. Play continued 8. .... Qb8; 9. Rc1, f6; (9. .... d6; 10. Be5, de; 11. Nc7 would lose the Queen) 10. Nc7, Kd8; 11. Na8, Qa8; 12. Be5, fe; 13. Qc3, Qb8; 14. Be2, d6; 15. O-O, Bd7; 16. f4, ef; 17. Rf4, Bc6; 18. Rcf1, Kc7; 19. Bf3, Kd7; 20. Bc6, bc; 21. Qf3, and Black will lose the black squared Bishop as well.

Another strategy which can be useful is to keep the opposing forces apart so that GnuChess has to use judgement rather than precise calculation. In the absence of concrete threats, the computer is likely to make it's position worse, as in the next example. GnuChess has played stolidly as White in a Modern Benoni opening to reach the position in Diagram 3. Black has no problems but has difficulty making headway. If Black plays straightaway to advance the b and c-pawns by Bd7 and b5, then GnuChess will react to the immediate threats and will play well. Instead Black simply moves his K Knight back and forth to see what GnuChess will do.

3. Black (Human) to play

	BR	BB		BR		BK	
	BP	BQ			BP	BB	BP
BP			BP		BN	BP	
		BP	WP	BN			
WP				WP	WB		
	WP	WN	WB		WP		
			WQ	WN		WP	WP
		WR			WR	WK	

White (GnuChess)

Play continued 15. .... Nfd7; 16. Bc2, Ndf6; 17. Bh6, Bh8; 18. Qg5. White has moved his Q-Bishop and Queen to the King's side, looking for an attack which isn't there. Black takes advantage of the absence of these pieces from the Queen's side to begin operations: 18. .... b5; 19. ab, ab; 20. b4 ? (I don't understand why GnuChess plays this move. Perhaps it is hoping for a discovered check on the Queen.), cb; 21. Nd1, Nc4; 22. Bd3, Qc5; 23. Nf2, Nd7; 24. Rfe1, b3; 25. Qg3, b2; 26. Rc2, Ra8; 27. Rb1, Ra1; 28. Rc3. Black has now such an overwhelming position that he has no need to take the White Rook and increases the pressure with 28. .... Ne5; 29. Bc2, Qb4; 30. Nd3, Nd3; 31. Rd3, Na3; 32. Ra3, Qa3. Black wins easily.