

BLACKJACK STRATEGY (version 1.1)
(copyright 1985, 1988, David Fibush)
A SHAREWARE PROGRAM

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1.0 GETTING STARTED

System requirements: IBM PC, 128K, Mono or graphics display

Your master disk contains the following files:

- BJ.EXE main program for the blackjack game.
- STRATEGY.DTA strategy data used by the program.
- OPTIONS.DTA options data used by the program.
- BJ.DOC this documentation file in MS Word format.
- BJ.TXT this documentation file in ASCII format.

Only the first two files are needed to run the program. The program will create an OPTIONS.DTA file if it does not exist. STRATEGY.DTA is a text file which can be created or modified with any text editor however you must use the exact original as a template.

To protect your BLACKJACK STRATEGY game you should always operate using a working copy of the program disk. Use the following procedure to make the working copy.

1. Format a blank disk. Include your operating system if you wish to boot your computer from the work copy.
2. With your master disk in drive a: and the formatted disk in drive b: copy all programs from the master to the work copy using the command `Copy a:*. * b:`
3. Place your work copy in drive a: and at the prompt `A>` type the command `BJ <carriage return>`.

1.1 OPTION MENUS

As soon as the program has loaded into computer memory you will see the first option menu (shown in figure 1) which displays the House Rules and Point Count Weights data from the file OPTIONS.DTA. If you do not wish to change the options enter `0 <carriage return>` or just `<carriage return>` to continue to the Play & Display Options menu (shown in figure 2). Again you may enter `0` if you wish to go directly to the game without changing any options. Use the original default conditions to start playing the game immediately and become familiar with its operation.

1.2 BASIC PLAY

With the original default conditions you are the third player at a five player table, bets are automatically made at 10 units so you need only play your hand. Press F1 for a display of the possible actions. See section 6.0 for detailed playing instructions.

*** HOUSE RULES ***

*** POINT COUNT WEIGHTS ***

- * DEALER PLAY *
- 1. Dealer hits soft 17 N
- 2. 1 card only on split Aces Y
- 3. Allow split of unlike 10s N
- 4. Allow more than 1 split Y
- * SPLITTING *
- 5. Allow double on split Y
- 6. Allow double 10 and 11 only N
- 7. Allow double on 3+ cards N
- * DOUBLING *
- 8. Number of Decks 6
- 9. Shuffle Percent 80
- * DECKS & SHUFFLE *
- * SURRENDER *
- 10. Allow surrender N

- 11. Weight for A = -1
- 12. Weight for 2 = 0
- 13. Weight for 3 = 1
- 14. Weight for 4 = 1
- 15. Weight for 5 = 1
- 16. Weight for 6 = 1
- 17. Weight for 7 = 1
- 18. Weight for 8 = 0
- 19. Weight for 9 = 0
- 20. Weight for 10 = -1
- 21. Weight for J = -1
- 22. Weight for Q = -1
- 23. Weight for K = -1

Item to change or 0 for no change _

Figure 1. First Menu

*** PLAY & DISPLAY OPTIONS ***

- * TYPE OF PLAY *
- 1. Position 6 5 4 3 2 1
- User ? N N N Y N N
- 2. Number of Players 5
- 3. Manual bets for player N
- 4. Speed of play (1 to 20) 10
- * GENERAL VALUES *
- 6. Number of Hands 100
- 7. Basic bet size 10
- 8. Initial player holdings 1000
- 9. Strategy file STRATEGY.DTA
- * DISPLAY *
- 10. 1st card down on autoplay N
- 11. Player hand point count Y
- 12. Player present bet size Y
- 13. Player present holdings Y
- 14. Number of cards not dealt Y
- 15. Number of hands played N
- 16. Size of dealer's bank N
- 17. Point count of cards shown N
- 18. Record of decisions made N
- 19. Sound on Y
- 20. Return to House Rules menu

Item to change or 0 for no change

Figure 2. Second Menu

2.0 CHANGING OPTIONS

When each menu is displayed you may change a value by entering the corresponding item number. You are then prompted to enter either a value or a yes/no response. A carriage return will give the default value. The menu is then reprinted showing the new value and you may enter more changes or continue to the next step. If you have made any changes they may be saved before the game starts.

2.1 HOUSE RULES (first menu)

* DEALER PLAY *

Option 1. Dealer Hits Soft 17 - this gives an advantage to the house since there is a good chance to improve the hand. If this is set to "N" the dealer will hit all 16s and stand on all 17s.

* SPLITTING *

Option 2. Allow 1 Card Only on Split Aces - split aces are a powerful hand, some casinos will only give you one card for each hand in this case.

Option 3. Allow split of unlike 10s - this means you can split a combination like Jack - Queen. Although this might seem to be an advantage it is never advisable to split 10s as 20 is a very good hand.

Option 4. Allow more than 1 split - definitely an advantage to the player hence limited to one split by some casinos. In Blackjack Strategy the maximum amount of splits is two with five or less players and only one split with six players due to screen size limitations.

* DOUBLING *

Option 5. Allow double on split - this gives an improved advantage to the player since you only double if you have a good chance to win. If this is set to "N" a double is not allowed on split hands.

Option 6. Allow split on 10 and 11 only - many casinos have this restriction.

Option 7. Allow split on 3 or more cards - a fairly unusual option of considerable advantage to the player.

* DECKS & SHUFFLE *

Option 8. Number of decks - a number between 1 and 10 as determined by the house management. Some casinos have tables with different numbers of decks. The smallest number of decks is advantageous to "card counters" however when

one deck is used it is often shuffled about half way through to limit the counter's advantage.

Option 9. Shuffle percent - the point in the deck which triggers the next shuffle when a hand is completed. Generally around 80% for multiple decks and as low as 50% for a single deck. You may select a value between 50% and 99%.

* SURRENDER *

Option 10. Allow surrender - you may surrender your original hand for one-half of your bet. This action takes place after the dealer has checked for a blackjack when your turn to play comes. This is advantageous to the player with a bad hand when the dealer has a high card showing.

2.2 POINT COUNT WEIGHTS (first menu)

Options 11 through 23 on the first menu allow you to set the weight for each card in a suit to be used for card counting. The weights chosen will depend on the system you wish to use, see the bibliography for reference material. Blackjack Strategy will keep track of the point count and either display it continuously or momentarily at your request.

2.3 PLAY AND DISPLAY OPTIONS (second menu)

* TYPE OF PLAY *

Option 1. User Inputs - Each of the active player positions (there can be up to 6) will be played either automatically by the computer or manually by you, the user. By setting just one position to "Y" you simulate an actual game where you are playing that position. Note that positions are numbered from right to left which is the dealing order at the blackjack table. If you wish to play more than one position for more practice at making play decisions then set the desired number of positions to "Y".

For completely automatic play set all the positions to "N" and the computer will play all the hands. This allows you to sit back and watch or let the computer play a few thousand hands to evaluate the automatic strategy or one of your design.

Option 2. Number of Players - Values from 1 to 6 are allowed. Due to screen space limitations, splitting a second time can only take place if there are 5 or less players. You would be surprised how common this can be if you are using 6 to 10 decks. Other numbers of active positions are available to suit your desired playing conditions. Remember you can manually play any or all of the positions.

Option 3. Manual Bets for Players - If you want to modulate your bets set this to "Y". In that case you will have to supply a bet input for each position you are playing. Bets must be multiples of 2. When placing your bet a <carriage return> gives the value of the Basic Bet if desired. When Manual Bets is set to "N" the computer automatically bets the Basic Bet each time.

Option 4. Speed of Play - A value which controls the speed of the game. The highest speed will play about 3000 individual player hands per hour with all positions in automatic play which is useful for evaluating different strategies. The slower speeds will help you learn to count cards. Try different numbers to get the effect you like.

* GENERAL VALUES *

Option 6. Number of Hands - This specifies the number of hands that will be played before the program automatically stops and offers an exit point or various continuation possibilities. Large numbers are useful for evaluating strategies or just not being bothered with restarting the game. There are interrupt methods to access the exit options at the end of each hand or at any point in the game you have the following control possibilities:

Control-S stops action, hit any key to restart.

Control-C quits the game and returns to the operating system.

Option 7. Size of Basic Bet - bet size to be used if no manual input is given. This value must be a multiple of 2.

Option 8. Initial Player Holdings - this is how much money each player starts with. Don't lose more than you can afford.

Option 9. Strategy File Name - If you have a number of different strategies you may select the desired one. The program will check to see if the file exists but you are responsible to insure that the data is all correctly located in the file.

* DISPLAY OPTIONS *

Various values can be displayed on the screen as the game is in operation. A setting of "Y" displays them and a setting of "N" keeps them off. Each is described below.

Option 10. First card down on automatic play - For a more realistic (but less informative) display you can have the first card dealt down on hands you are not playing. At the appropriate times (bust, end-of-hand, etc) the card will be shown with a delay so you can see what it was. If you are using this option it would make a more realistic situation to set option 11, hand point count, to "N".

Option 11. Hand count values - this will show the point value of each hand just above the first card as play progresses. Turn this off if you are doing some serious practicing.

Option 12. Bet size - shows the present bet value for each player.

Option 13. Player holdings - shows how much money each player has. "There's

time enough for counting when the dealings done". Unless you are about to run out and want to double or split. (The bank will "lend" you the money as negative holdings are possible)

Option 14. Cards not dealt - a graphical display that shows the number of quarter-decks used and those that have not been dealt. The exclamation point indicates the quarter-deck that contains the shuffle trigger point.

Option 15. Number of hands played - shows the number of hands played.

Option 16. Size of dealer's bank - shows the amount of money in the dealer's bank. The dealer starts with 10,000.

Option 17. Point count of cards shown - a continuous display of the sum of the weights of all cards whose faces have been displayed since the previous shuffle. This value is available on a momentary basis if requested by the player during play of a hand.

Option 18. Record of decisions made - each action taken by the user-player is compared against the strategy. If the action does not agree with the strategy the computer will beep to let you know of your "error". A running count of the actions and percent correct may be displayed.

Option 19. Sound on - the beep described in option 18 may be turned on or off.

3.0 MANUAL BET INPUTS

If you have selected the option for manual bet inputs a screen similar to figure 3 will be displayed at the start of each hand. Only even numbers from 2 to 100 will be accepted. The figure shows that Player 1 bet 20, Player 2 bet 10 and Player 3 is being asked for a bet value. The function keys allow easy input for multiples of the basic bet. Push F1 for a help menu.

```

                Deck [..*****!****]
Place your bets.
Multiples of 2 only.

Player 4      Player 3      Player 2      Player 1

Your bet?

                Bet=10      Bet=20
Hold=355      Hold=780      Hold=600      Hold=1255
```

Figure 3. Manual Bet Screen

4.0 SHUFFLE

This is automatic at the start of the game, if the end of the deck is reached during a hand or and when the cards left with the dealer at the end of a hand are less than the calculated amount based on the Shuffle Percent (see option 9 in the first menu). Also there will be a shuffle if there are not enough cards left for 4 per hand to be played including the dealer. Each shuffle is a computer representation of cards randomly chosen from the decks to be used. Cards are then placed in that order to be used until the next shuffle.

5.0 DEAL

Cards are dealt in the usual order. The first card to the dealer is shown "down" as are the first cards to automatically played hands (if that option is chosen), all the rest are up. After the cards are dealt various optional values are displayed, such as, hand number, player bets, etc.

6.0 PLAY

6.1 INSURANCE

If the dealer is showing an Ace, all user controlled hands are asked if they would like insurance. Acceptable responses are:

F9 or Y or y for Yes
F10 or N or n for No

Insurance is a side bet for an amount equal to one-half the present bet on the hand. If the dealer has a blackjack, insurance pays 2 to 1 hence you break even if your hand (say a 20) would have lost to the dealer's 21. At that point the screen is cleared and a new hand is dealt.

When the dealer does not have a blackjack you lose your side bet and play continues. Automatically played hands do not take the insurance bet.

6.2 PLAYER'S BLACKJACK

Any players that have blackjack are immediately paid at 1.5 to 1 and their first card is shown, if necessary, and then the cards removed from the "table".

6.3 USER PLAY

If hand point count values are to be shown it will be displayed at the top of the hand in the form "NN H" for hard hands or "NN S" for soft hands. As the individual hand is played the value will be updated as an aid in decision making. The hand values are also displayed on automatically played hands.

The user is then asked to make play decisions based on their cards and the allowed possibilities by answering the prompt "Action" with the following choices available:

F1 displays a one line help display of these responses.

F2 or E or e to go to the exit options at the end of the hand. Normal play continues.

F3 or L or l for look which will momentarily display the decision programmed into the strategy. This is like learning from flash cards, you can always look at the answer if needed.

F4 or V or v to view the hand count value. This is of interest if the hand count option is off. It simulates asking the dealer for the count.

F5 momentarily displays the card count based on the weighting system being used.

F6 or Q or q to surrender (or quit) only with the original hand if that action is allowed by the house rules.

F7 or Y or y will split the hand. If the player has a "pair" they may be split and played as two hands with the same bet required on each hand as the original bet. When the hand is split each hand is played separately. If a second pair were to be dealt on either hand and a second split is allowed (provided there are 5 or less player positions) and then there are three hands played for that position.

F8 or D or d for double when allowed by the house rules. If this is selected the bet is doubled and only one more card is dealt to that hand.

F9 or H or h for hit which deals another card to the hand.

F10 or S or s for stand which ends the decision process for that hand.

Following the action determined by the decision the hand value is calculated. If the total is greater than 21 the hand is bust which is indicated in the hand value location and the cards are removed from the "table" after first showing any down card. If the total is 21 or less, further action is requested in the case where the previous action was a hit.

Since all this action happens automatically if no user positions have been specified there is another "escape" to the exit options. If you hold the space bar or any other key down during the end of the hand you will interrupt the action and move to the exit options by entering a <carriage return> when requested by the program.

6.4 DEALER PLAY

After all hands are played the dealer's hand is played. First the down card is shown then the dealer hits 16 and stands on hard or soft 17 depending on the house rules option setting.

6.5 END OF PLAY

Each hand still active (not blackjack or bust) is compared to the dealer's to determine win, lose or push. Player's holdings and the bank are adjusted accordingly.

6.6 END OF GAME

New hands will continue to be dealt until the hand count reaches the maximum set by the options. Shuffling will occur as needed. Once the hand count maximum is reached a summary of the data for that run of hands will be displayed along with the exit options.

6.7 DATA SUMMARY AND EXIT OPTIONS

Figure 4 shows the data summary and exit options. The highest, lowest and final holdings are shown for each player along with the hand at which those holdings occurred and the "efficiency" at that point. Efficiency is defined as winnings divided by the total amount bet expressed as a percentage. This calculated value can be used to evaluate the quality of your strategy as modified by the "laws of chance". The values shown are typical for the built in strategy contained in the file STRATEGY.DTA.

At this point you have three exit options:

[E]nd the game and return to the operating system.

[N]ew options essentially restarts the game by returning to the options screen and resetting the hands played to 0.

[P]rint will send a copy to the data summary to your line printer.

c/r <carriage return> will continue the play until the maximum number of hands is reached or on a hand-by-hand basis if the hands are already at the maximum.

DATA SUMMARY

Strategy file name = STRATEGY.DTA

	Player 6	Player 5	Player 4	Player 3	Player 2	Player 1
Highest						
holdings	2015	1800	1735	1920	1710	2075
at hand	6036	1586	2028	1496	2023	4243
efficiency	1.39%	4.19%	3.02%	5.11%	2.93%	2.10%
Lowest						
holdings	865	285	135	590	-70	740
at hand	40	5764	5547	5843	5482	129
efficiency	-26.47%	-1.03%	-1.30%	-0.58%	-1.63%	-16.56%
Final						
holdings	1920	530	635	785	250	1415
at hand	6140	6140	6140	6140	6140	6140
efficiency	1.24%	-0.64%	-0.50%	-0.29%	-1.02%	0.56%
Total Amount Won	=	-465	Total decisions	=	0	
Total Amount Bet	=	443250	Total correct	=	0	
Total Hands Played	=	37671	Percent correct	=	100.00%	
Overall Efficiency	=	-0.10%				

[E]nd game, [N]ew options, [P]rint summary, or c/r to continue

Figure 4. Data Summary and Exit Options

7.0 STRATEGY

The strategy used for automatic play (and as a prompt if you "look" before making your decision point) is determined by characters in a text file approximately shown in figure 5. You may change the controlling characters with a text editor but it is critical that each one be in the correct location for proper operation. Make a copy of STRATEGY.DTA under some other name and then use your text editor in the overwrite mode. The name of the new file may then be entered under option 9 of the second menu or you may rename the altered file to the default name STRATEGY.DTA for use by the program. Each table has the dealer up card values across the top and player hand values shown on the left and in the middle. Action determining characters are <S>tand, <H>it, <D>ouble, <Y>es do split and <Q>uit as in surrender.

If no strategy file exists on the disk a "dumb strategy" of hit 16 or less, stand on 17 or more will be used.

7.1 HARD HANDS

These are hands that do not contain an Ace valued at 11. If they contain only two cards or if a double is otherwise allowed by the house rules the right side of the first table is used. Only player values down to 4 need to be considered as lower values must contain an Ace and would be determined in the second table.

7.2 SOFT HANDS

These hands contain 1 Ace valued at 11 which could be reduced to 1 if the subsequent hit were to cause a "bust". Only values down to 12 need to be considered as 2 Aces is the lowest soft hand.

7.3 HANDS THAT CAN BE SPLIT

In this table the "Y" stands for, yes do split. The other characters indicate the action of choice rather than split and are assumed to be <N>0 in automatic operation. Only even values for the player considered as they are all pairs. The only soft pair is 2 Aces.

7.4 SURRENDER

"Q" for quit is used for surrender to differentiate it from the other choices. When the "Q" occurs in the table it will be interpreted as an "H" if surrender is not allowed by the house rules option setting. Therefore you do not want to put a "Q" in a location that should be split, double or stand except when actually using the surrender option.

8.0 BUGS AND FIXES IN VERSION 1.1

1. Printed data summary shows "overall efficiency = 0%" when it should be something else. (fixed)
2. If you have used the exit command the dealer takes his cards up too quickly to see. (fixed)
3. On manual played hands when player declines insurance and dealer wins the bet is not collected from the player. (fixed)

4. Doesn't always beep on a strategy error. Example is hit a pair of nines. (not fixed)
5. One-deck shuffle at 75% occasionally causes screen to go crazy during the shuffle. (not found)
6. When using a strategy which never doubles or splits, more is bet than the expected 10% per hand. (fixed relates to 3 above)
7. When entering bets manually the first digit of the user input does not show on the screen but is entered. (fixed)
8. Deck meter (upper right hand corner of display) now expanded to full length for all numbers of decks.

6 H H Y Y Y Y H H H H 6
4 H H Y Y Y Y H H H H 4

Figure 5. Strategy Text (approximate)

9.0 COPYRIGHT and SHAREWARE REGISTRATION

BlackJack-Strategy is copyright 1985, 1988 by David K. Fibush.

The BlackJack-Strategy (Program) is protected by copyright laws and is a proprietary product of J.P. Enterprises and David K. Fibush. This is a shareware program. If you received this program from a source other than J.P. Enterprises you are expected to send the \$15 registration fee to:

J.P. Enterprises
3877 Hancock Drive
Santa Clara, CA 95051

10.0 DISCLAIMER

Use of this program acknowledges this disclaimer of warranty:

The Program is supplied "as-is". J.P. Enterprises disclaims all warranties, expressed or implied, including, without limitation, the warranties of merchantability and of fitness of this program for any purpose. J.P. Enterprises does not warrant that the functions contained in the Program will meet your requirements or that the operation of the Program will be either error free or appear precisely as described in the Program documentation. J.P. Enterprises assumes no liability for damages direct or consequential, which may result from the use of this program.

11.0 PRODUCT SUPPORT

This program has been thoroughly tested. If you find the program does not work as described in this documentation, or if you have suggestions for improvements, please write to:

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APPENDIX A. Basic Rules of Blackjack

- A.1 **THE OBJECT OF THE GAME:** The player attempts to beat the dealer by obtaining a total of cards equal to or less than 21, such that the player's total is higher than the dealer's. Note that the idea is to BEAT THE DEALER, not get as close as possible to 21.
- A.2 **NUMBER OF PLAYERS:** Generally the game has a dealer and one to seven players. Blackjack-Strategy allows up to six players.
- A.3 **NUMBER OF DECKS:** One to six decks are common. "Card counters" prefer a one deck game.
- A.4 **VALUE OF CARDS:** Each card has the same value as its spots except for the ace and picture cards. All 10s and picture cards are counted as 10. The ace can be valued as either 1 or 11, at the option of the player. A hand containing an ace that can be counted as 11 (that is, by counting the ace as 11, the hand does not exceed 21) is called a "soft" hand. All other hands are "hard" hands.
- A.5 **THE DEAL:** Each player is dealt two cards in sequence, one at a time, either face-up or face-down, depending on the rules of the house. The dealer's card that is face-up is referred to as the "up-card" and the value of this card is the key piece of information used to determine the playing strategy. Additional cards to the players are dealt face-up, one at a time based on the players choices during the play.
- A.6 **BLACKJACKS:** If the first two cards dealt to a player are an ace and a ten-valued card, the player has a blackjack and receives one and one-half times his original bet. If the dealer has a blackjack and the player does not, the player loses the total of his original bet. If both the player and the dealer have a blackjack, the hand is a tie or a "push". In most casinos and in Blackjack-Strategy, hands with a blackjack are settled immediately.
- A.7 **HITTING OR STANDING:** A player may draw as many cards as he wants, as long as his total does not exceed 21. "Hitting" is when a player asks for an additional card and "Standing" is when no additional cards are requested.
- A.8 **BUSTING:** If the player's cards exceed a total of 21, he has "busted" and loses the hand regardless of the dealer's total. If the dealer busts, all players who have not busted win the hand.
- A.9 **TIES:** If the player and the dealer have the same total, the hand is a tie or a "push". No money settlement takes place.
- A.10 **DEALER'S PLAY:** The dealer must draw cards until he has a total of 17 or above. In some casinos the dealer may hit a soft 17 in others he must stand on any 17.

- A.11 DOUBLING DOWN: In most casinos a player may double the amount of his bet after looking at his first two cards. He then receives only one additional card. Many casinos allow doubling only on totals of 10 or 11, some allow doubling on any hand.
- A.12 SPLITTING PAIRS: If the player's two cards are identical in value, the player may "split" them by betting an amount equal to his original bet on the second card. Each card is then played as a separate hand except that if aces are split, only one additional card is allowed on each ace. Some casinos allow splitting only once and some up to three times, for a total of four hands. BlackJack-Strategy allows splitting two times (three hands) when there are five players or less in the game. With six players BlackJack-Strategy only allows splitting once for each player.
- A.13 INSURANCE: If the dealer's upcard is an ace, the player may make a side bet called an insurance bet. The amount of the side bet may be as much as one-half of the original bet. If the dealer has a blackjack the casino will pay two to one on the insurance bet, therefore, the player loses his hand but wins on insurance and "breaks even" if he bet the maximum amount on the side bet. If the dealer does not have blackjack, the insurance bet is lost and the play of the hand continues. In BlackJack-Strategy an insurance bet is always one-half of the original bet. (This is why only even numbers are allowed for bets, it keeps numbers as integers.)
- A.14 SURRENDER: The player may surrender his original hand for one-half of the bet. This action takes place after the dealer has checked for a blackjack when your turn to play comes.

APPENDIX B: Bibliography

1. R. Baldwin, W. Cantey, H. Maisel, and J. McDermott, "The Optimum Strategy in Blackjack", *Journal of the American Statistical Association*, 51, 429-439, (1956).
2. L. Revere, *Playing Blackjack as a Business*, Lyle Stuart, Inc., New York, (1973).
3. L. Revere, *The Revere Advanced Point Count Strategy*, Paul Mann Publishing Co, Las Vegas, Nevada (1973).
4. E.O. Thorp, *Beat the Dealer*, (2nd edition), Random House, New York (1966), also in paperback Vintage Books, (1966).
5. E.O. Thorp and W. Walden, "The Fundamental Theorem of Card Counting", *International Journal of Game Theory*, 2, 2, (1973).
6. C. Ionescu Tulcea, *A Book on Casino Blackjack*, Pocket Books, New York, (1982).

7. K. Uston, Million Dollar Blackjack, SRS Enterprises Inc, Hollywood, California, (1981).