WELCOME TO GAPS!

GAPS was created for Dr. Thomas Saaty at the University of Pittsburgh's Katz Graduate School of Business.   GAPS is well known to all of Dr Saaty's students who take his Introduction to Operations class.   This game may be copied freely and shared under the Shareware principle;   if you enjoy the game I request that you help a   college student by sending $12 to register your copy of the game.   You will be sent the latest version of the game and I will keep you informed of future product updates as well as new Windows 3.0 shareware programs I am working on now and should be available by mid 1992.   The three files to distribute are GAPS.EXE, GAPS.HLP and VBRUN100.DLL

How to play
Card Moving Instructions
Two Rules to Moving Cards
Hints and Things to Remember

Keyboard Option
Slick Buttons
Move List Box
Setup A Game
Save/Open a Game
5,6,7,8 Cards

Insert/Remove a Move Marker
Undo/Undo to Last Move Marker
Gaps Solver
Final Note

HOW TO PLAY

The GAPS card game is somewhat similar to and is a variation of the Solitaire card game where the object of the game is to stack the cards in their proper sequential order and suit.   For example, when the game is started the user is in the 6-card mode where a combination of six cards and/or blank spaces appear in each row.   The object of the game is to properly move the cards so that they are aligned up in sequential order, A-2-3-4-5, of the same suit in each row, where each row holds a different suit and the last position holds a blank space.

e.g.	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6
Row 1	AH	2H	3H	4H	5H	__ (blank)
Row 2	AC	2C	3C	4C	5C	__ (blank)
Row 3	AS	2S	3S	4S	5S	__ (blank)
Row 4	AD	2D	3D	4D	5D	__ (blank)

H = Hearts   C = Clubs   S = Spades   D = Diamonds

Notice each ROW holds a different suit of sequentially ordered cards with the last COLUMN holding on of the 4 blank cards.

The GAPS game has an option for a 5, 6, 7 and 8 card game.   For the sake of discussion instructions will be given for the 6 card game, but the 5, 7 and 8 card versions are exactly the same with the exception of a different number of cards in the game.

CARD MOVING INSTRUCTIONS

When moving the cards on the board you move an existing card to a new location that is currently blank.   As you move cards a list of your moves is entered into the Move List Box at the bottom of the screen.   There are three ways to move cards:

1. Click and drag a card to an empty card slot.   If the move operation is a legal move then the blank card will change colors signifying that it is a legal move.   If the user releases   the mouse button while over a good blank card then the card will be swapped with the blank position.   If the move is illegal the blank card will remain the same color and no move operation will be accepted.

2. Click on an empty card slot and the appropriate card will be moved to that position.   e.g. click on an empty slot with a 2 Clubs to the left of it and the 3 Clubs will be moved to that empty slot position.   If the empty card is in the first column a window will appear asking which ACE to move.

3. Turn on the Keyboard option under the OPTIONS menu.   Two colored squares will appear indicating the cards to be swapped.   Use the TAB key to revolve through possible selections--use the RETURN key to make the selection and swap the cards.

THE THREE RULES TO MOVING CARDS

1. Aces can only be moved to blank card positions in the FIRST COLUMN.

2. When evaluating possible moves look at the card immediately to the left of the blank card.   A legal move will be the card in the next sequential order of the same suit.   i.e.   if there is a blank card and the card immediately to the left of it is a 3 Spades (3S), then only the 4 Spades   (4S) can be moved to that blank position.

3. If the postion immediatly to the left of BLANK POSITION is another BLANK POSITION then you cannot move a card to it.

e.g.	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6
Row 1		2C	4H	3S	2D	AC
Row 2	3D	4D		3C	5S	2H
Row 3	AS	4C	5C	3H	AH	AD
Row 4	4S	5H			5D	2S

According to the three rules of moving and this example setup you have several move options

1.   AS or AC or AD or AH can be moved to Row 1-Col 1 according to Rule 1
2.   According to Rule 2, the 5D can be moved to Row 2-Col 3 because immediately to the left of that position is the 4D (next lower number of the same suit)

NOTE   NOTHING CAN BE MOVED TO Row 4-Col 3 because the 6H is the required card according to rule 2 yet a six-card game uses cards only up to 5.   Thus that position is dead to any moves.

According to Rule 3, Row 4-Col 4 IS ALSO DEAD and nothing can be moved there because there is a blank card immediately to the left of it.

HINTS AND THINGS TO REMEMBER

1. Always try to move the lower cards into position first.   i.e.   Aces to the first column.   This will make your job of winning the game alot easier.   But remember, the skill involved in solving the game is when and which ace you move to a first column blank position.

2. If a move is legal, and you are moving the cards by dragging a card to a blank card position, the blank card will change colors signifying that a good card is being moved to that blank card position.

3. If you want to cancel your current operation when dragging a card just release the mouse button   when not over the intended target and the move is canceled, but if you are over a legal blank card you must first move off of that card or the move operation will take place.

KEYBOARD OPTION

If you don't have a mouse the game can be played by using a keyboard, although this can be quite cumbersome as well as some operations like placing a card back into a <u>SETUP A GAME</u> list can only be performed with a mouse. If the KEYBOARD OPTION is turned on by selecting it from the options menu, the game will respond to keyboard actions. Keyboard actions include:

1. While playing the game colored indicator squares will appear on pairs of cards indicating swap cards, by pressing the TAB key and the return key the user can select which cards to swap.

2. While setting up a game use the TAB key, UP and DOWN arrow keys, and RETURN key to swap cards.

3. Use the TAB key to select different buttons on dialogue windows.

SETUP A GAME

The Gaps game has an option where you can set up your own game.   Under the FILE menu select   "SETUP A GAME."   All of the cards will be cleared out and depending on which game you are playing (5,6,7 or 8 card), a list box of available cards will appear at the bottom of the playing board.   In order to put a card into an empty position, CLICK and HOLD the LEFT mouse to select the card you want, then drag the card to an empty position.

Notice that when you drag over an empty position the card changes colors to signal a legal move.   Once you have dragged the card over an empty position just release the mouse button and the card will be positioned. Continue these steps until all cards are placed.

The user also has the option of putting a card back into the list of available cards by just reversing the operation and dragging a card back into the list box.   You also have the ability to replace a card in another position by just clicking and holding on an existing card a dragging it to another empty postion.

If the keyboard option is on use the UP and DOWN arrow keys to select a card from the available list, use the TAB key to highlight a blank card for placement, and use the RETURN key to drop the card.

SAVE/OPEN A GAME

The Gaps game gives you the ability to save a current game including all moves to a file.   Just as well you can retrieve a game that has been previously saved.

PLEASE NOTE--the game automatically attaches a .GAP extension to any data file saved.

5,6,7,8 CARD

These options under the OPTIONS menu will enable you to select a different game with the appropriate number of cards.

INSERT/REMOVE A MOVE MARKER

The Gaps game enables you to insert/remove a marker into your move list.   By strategically placing <u>MOVE MARKERS</u> into your move list you can MOVE BACK a set number of moves with the touch of a key.

This is very useful for going back to a user-set starting postion.   You can place as many move markers as you want in any postion.   You must, though, place the movemarker at the time of the current move.

At the bottom of the screen is a scrolling list that lists all cards that have been moved in the game.   If a Move Marker is inserted into the list a mark is placed in the list.   This feature is useful when you want to mark a current game situation where you can return to if you end up at a dead end no solution and you want to return to a postion.

UNDO/UNDO TO LAST MOVE MARKER FEATURE

There is a feature in the OPTION menu to UNDO your last move or undo to the last move marker.   Selecting it will undo   moves.   A history is kept of all moves made during the game, thus you can UNDO all of your moves to the start of the game, undo to select points where Movemarkers have been inserted earlier, or just undo one move at a time.

GAPS SOLVER

The Gaps game includes a SOLVER feature to help find a solution to a game.   This feature is only included in registered versions of the game.   If a solution has been found to a game a list box will appear on the bottom of the screen listing, in sequential order, the set or moves to the solution.   e.g.   if the list box says "4C   Row 4-Column 2" that means   move the 4 Clubs to Row 4-Column 2.   Also, a message box will first appear before the list box indicating if there is a solution, how much time it took to find the solution, and the total number of moves to the solution.

PLEASE NOTE--first, not every game   has a solution!   Second, the time to find a solution varies greatly according to the present condition of the game.   It could take as little as 2 seconds or as long as several hours to find a solution. After several hours you may even be told that no solution exists. The time it takes to find a solution also varies greatly with the size of the game   (5,6,7 or 8 cards), the present situation of the cards, and with the power of your computer to run mathematical calculations.   e.g.   a 386 type computer will process alot faster than a 286 type.

Another thing to note here--most solutions, if existing, are found within 1 minute of beginning the solver, although a lengthy time may also be required to find a solution.

ONCE YOU BEGIN THE SOLVER YOU MAY CANCEL OUT OF IT AT ANY TIME IF YOU DON'T WANT TO WAIT!

A FINAL NOTE

Best of luck with the game and don't forget to register your copy if you haven't done so already!   If you have any comments or suggestions I would really like to hear from you.   I can be reached by mail, phone, or Compuserve.

Richard T. Kokoski
12596 Folly Quarter Road
Ellicott City, Maryland   21042
(410)531-3445

Compuserve: 70751,3316

MOVE LIST BOX

A Move List Box appears at the bottom of the screen to indicate the current list of moves that you have made so far. e.g.   if you move the 4 Clubs then a "4C" will appear in the Move List Box.

The one exception to this is when an ace card is moved since an empty slot in the first column can hold any one of 4 Aces.   What will appear in the Move List Box will not be the ace card that you have moved, but a combination of the ace suit plus the row in which the ace was moved to.   i.e.   If you move the A Clubs into row 2 what will appear in the Move List Box will be "C2"   NOT "1C".   ----   Notice here that the NUMBER and LETTER are interchanged for an ace move versus any other move.

Also notice in the Move List Box you may see additional characters that look like squares.   These "Squares" are MOVE MARKERS.

This same Move List Box is included in any game information sent to the printer.

Slick Buttons

Down the right hand side of the game board you will see a series of buttons.   These buttons act as shortcuts to the most common used menu items.   The list includes:

New Game

Insert a Move Marker

Open a Game

Remove a Move Marker

Save a Game

Undo last move only

Setup a Game

Undo to last Move Marker

Print a Game

Begin Solver

Select Game Size