CHOMP

Chomp is a simple, two player game played on a rectangular board consisting of chips arranged in rows.

GAME PLAY

Players alternate choosing a rectangle to "chomp" out of the board. A chip is chosen and all chips to the right and above that chip are removed from play.

The goal of the game is to force your opponent to take the lower left hand or "poisoned" chip.

The board is represented by 100 chips. These are numbered from 0 to 99 and are arranged as shown below. In the following diagrams each chip that is alive is represented by a red square. Chips that have been removed are represented by white squares. The poisoned chip is chip number 9.

Row										
0	0	10	20	30	40	50	60	70	80	90
1	1	11	21	31	41	51	61	71	81	91
2	2	12	22	32	42	52	62	72	82	92
3	3	13	23	33	43	53	63	73	83	93
4	4	14	24	34	44	54	64	74	84	94
5	5	15	25	35	45	55	65	75	85	95
6	6	16	26	36	46	56	66	76	86	96
7	7	17	27	37	47	57	67	77	87	97
8	8	18	28	38	48	58	68	78	88	98
9	9	19	29	39	49	59	69	79	89	99
Column	0	1	2	3	4	5	6	7	8	9

Supposed a player takes chip 56. This chip and all chips above and to the right of it are removed from play. And the board looks like this.

Row										
0	0	10	20	30	40	50	60	70	80	90
1	1	11	21	31	41	51	61	71	81	91
2	2	12	22	32	42	52	62	72	82	92
3	3	13	23	33	43	53	63	73	83	93
4	4	14	24	34	44	54	64	74	84	94
5	5	15	25	35	45	55	65	75	85	95
6	6	16	26	36	46	56	66	76	86	96
7	7	17	27	37	47	57	67	77	87	97
8	8	18	28	38	48	58	68	78	88	98
9	9	19	29	39	49	59	69	79	89	99
Column	0	1	2	3	4	5	6	7	8	9

THE END OF THE GAME

The game ends when a player reduces the board to just the poisoned chip (chip 9) and the only move her/his opponent has is to take it and lose the game.

Row										
0	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**
1	**1**	**11**	**21**	**31**	**41**	**51**	**61**	**71**	**81**	**91**
2	**2**	**12**	**22**	**32**	**42**	**52**	**62**	**72**	**82**	**92**
3	**3**	**13**	**23**	**33**	**43**	**53**	**63**	**73**	**83**	**93**
4	**4**	**14**	**24**	**34**	**44**	**54**	**64**	**74**	**84**	**94**
5	**5**	**15**	**25**	**35**	**45**	**55**	**65**	**75**	**85**	**95**
6	**6**	**16**	**26**	**36**	**46**	**56**	**66**	**76**	**86**	**96**
7	**7**	**17**	**27**	**37**	**47**	**57**	**67**	**77**	**87**	**97**
8	**8**	**18**	**28**	**38**	**48**	**58**	**68**	**78**	**88**	**98**
9	**9**	**19**	**29**	**39**	**49**	**59**	**69**	**79**	**89**	**99**
Column	0	1	2	3	4	5	6	7	8	9

DEFINITIONS

There are Winning Boards and Losing Boards. Let's keep the definitions from your point of view.

Winning Boards

Boards that when given to opponents will lead to you winning the game are Winning Boards. The board above is a winning board. If you give to an opponent you will win the game.

Losing Boards

Boards that when given to opponents will allow them to win are Losing Boards. These are boards that when given to opponents can be converted into a Winning Board for them. An example of two losing boards are shown below. You opponent only has to take one chip and you're stuck eating the poisoned chip.

0	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**
1	**11**	**21**	**31**	**41**	**51**	**61**	**71**	**81**	**91**
2	**12**	**22**	**32**	**42**	**52**	**62**	**72**	**82**	**92**
3	**13**	**23**	**33**	**43**	**53**	**63**	**73**	**83**	**93**
4	**14**	**24**	**34**	**44**	**54**	**64**	**74**	**84**	**94**
5	**15**	**25**	**35**	**45**	**55**	**65**	**75**	**85**	**95**
6	**16**	**26**	**36**	**46**	**56**	**66**	**76**	**86**	**96**
7	**17**	**27**	**37**	**47**	**57**	**67**	**77**	**87**	**97**
8	**18**	**28**	**38**	**48**	**58**	**68**	**78**	**88**	**98**
9	**19**	**29**	**39**	**49**	**59**	**69**	**79**	**89**	**99**

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1	**11**	**21**	**31**	**41**	**51**	**61**	**71**	**81**	**91**
2	**12**	**22**	**32**	**42**	**52**	**62**	**72**	**82**	**92**
3	**13**	**23**	**33**	**43**	**53**	**63**	**73**	**83**	**93**
4	**14**	**24**	**34**	**44**	**54**	**64**	**74**	**84**	**94**
5	**15**	**25**	**35**	**45**	**55**	**65**	**75**	**85**	**95**
6	**16**	**26**	**36**	**46**	**56**	**66**	**76**	**86**	**96**
7	**17**	**27**	**37**	**47**	**57**	**67**	**77**	**87**	**97**
8	**18**	**28**	**38**	**48**	**58**	**68**	**78**	**88**	**98**
9	**19**	**29**	**39**	**49**	**59**	**69**	**79**	**89**	**99**

THE JAVA GAME

Chips

In our Java game our board is made up of chips so we have a Chip.java class. Since the chips will be displayed in our Applet window it has the usual variables – xpos, ypos, isAlive and a Rectangle myRect. In addition it has an integer variable – chipNum.

```
import java.applet.*;
import java.awt.*;
import java.awt.event.*;
import java.util.*;

public class Chip
{
        public int xpos,ypos;
        public Rectangle myRect;
        public boolean isAlive;
        public int chipNum;

        public Chip(int x,int y,int z)
        {
                chipNum=z;
                isAlive=true;
                xpos=x;
                ypos=y;
                myRect=new Rectangle(xpos,ypos,24,24);
        }
}
```

The Game Board

Our game board is a 10 x 10 board that consists of 100 chip locations. To represent the game board there is an array of 100 chips in the main progam (applet). When a new game is started all 100 chips' isAlive variables are set to TRUE.

Making Moves

To make a move a player chooses a chip to "take". When this is done the isAlive variable of the chip taken and those of the chips above and to the right of it are set to FALSE. In the boards above the red chips have an isAlive variable of TRUE. All the white chips have an isAlive variable of FALSE.

WRITING A PLAYER

You'll need to understand the rules of the game and play the game. Try playing it with some friends or against yourself. Look for patterns and Winning Boards.

The Java Player

The player for our Java version of Chomp is a class that basically needs to do 2 things.

1. Analyze the board.
2. Return the chip number to take (an integer).

To perform this task your player will receive the board from the game. This will be the array of chips. Here's a very basic player with the required move ( ) method which take in the array of chips and returns an integer. It's not very intelligent and only has one move – take chip 8.

```
public class Player
{
        public Chip[] gameboard;

        public int move(Chip[] chips)
        {
                gameboard = chips;      //take in the board.
                return(8);              //make "the move" by telling the program to take chip 8
        }

}
```

ASSIGNMENT 1

Describing the Board

To analyze things your program will need to be able to describe the board.

You have 3 things that will do this.

1. Each chip's isAlive value.
2. How many chips there are in each column.
3. How many chips there are in each row.

Create a method for your player that will take the array of chips, count how many chips there are in each column and store it in an array of ten integers called column[].

Hint – use loops to go through each column and look at each chip's isAlive value.

What's going to help?

Start small. Play games starting with a 2x2 board. Write down/draw all the possible boards and note which ones are winning boards and which ones are losing boards. Then move to a 3x3, 4x4 and 5x5 board. Look for patterns. Take each board and see what boards you get when you remove a chip. Is that board a winner or loser?