How To Play Go

Lesson 10: Capturing Races

10.1 Introduction

A *capturing race* occurs when black surrounds a white group, but is itself partially or wholly surrounded by white, and neither surrounded group is alive by itself. The idea of the capturing race is actually implicitly brought out in many of the earlier lessons, especially in section 2.4, titled “Seki”.

Generally, there are three possible outcomes from a capturing race:

- Black wins the capturing race (i.e. black captures the white group).
- White wins the capturing race.
- The result is a seki.

The capturing race is actually a “race” of liberties. Usually, the party with more liberties will win the capturing race.

10.2 How To Fight A Capturing Race

Now we shall study the simplest case. See Diagram 10-1, a capturing race between the marked stones where each party has four liberties each.

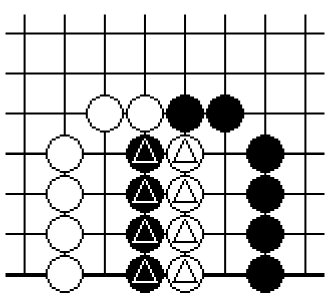

Diagram 10-1

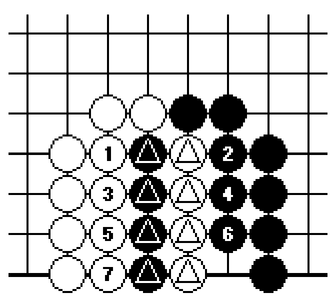

Diagram 10-2

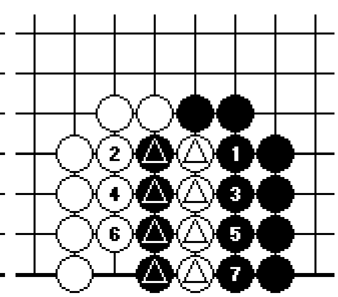

Diagram 10-3

Suppose white plays first. By reducing the liberties one by one in Diagram 10-2, white will capture black at 7. Diagram 10-3 shows what happens if black plays first. In this case, black fills up all the liberties before white and wins the capturing race.

Next, we consider the case when one party, say, black has more liberties. This is the case depicted in Diagram 10-4 (black has one extra liberty).

We can see that even if it is white’s turn, and he starts reducing the liberties of the five black stones in Diagram 10-5. However, black 4 already ataris the white group, and by the time white 5 reduces the black group to one liberty, black 6 sends the four white stones off the board. From this we can deduce that even if white plays first in Diagram 10-4, black will still win the capturing race. In short, the white group is effectively dead and white can (and should) actually play elsewhere.

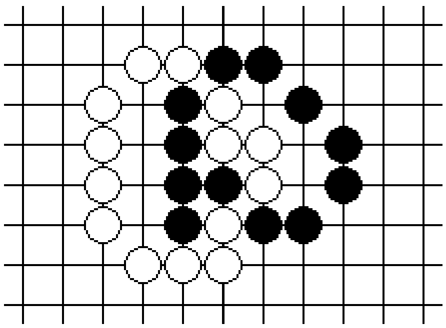

Diagram 10-4

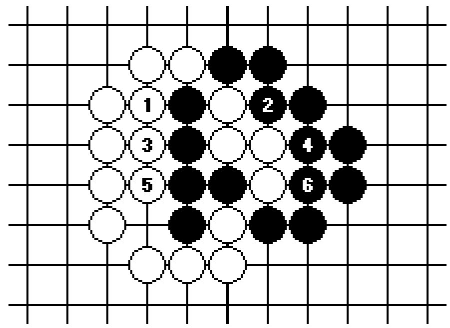

Diagram 10-5

In conclusion, if both players have the same number of liberties, the player who plays first wins the capturing race. If one player has more liberties than the other, then that player wins the capturing race.

10.3 Common Liberties

In capturing races, it is very often for both groups to have liberties in common. We call them *common liberties*, otherwise also known as *shared liberties*. Diagram 10-6 illustrates an example, where the common liberty is marked X. They have an equal number of *outer liberties*, three each. The question is: white first, how to win the capturing race?

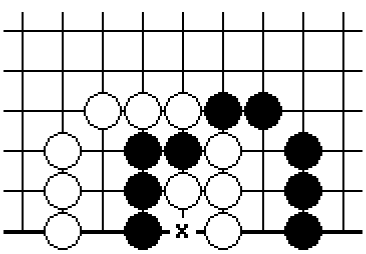

Diagram 10-6

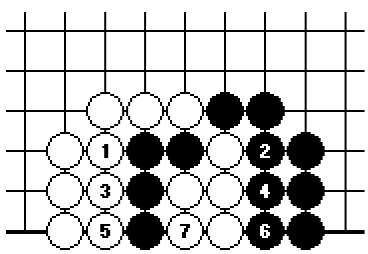

Diagram 10-7

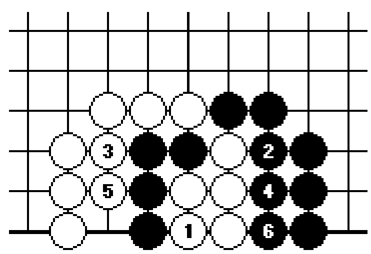

Diagram 10-8

The correct way of filling up liberties is shown in Diagram 10-7. White starts filling up liberties outside, and finally fills up the common liberty at 7, and wins the capturing race. If white 1 fills up the common liberty instead, Diagram 10-8 results. Now both groups have three liberties each, and it is black's turn, so black wins the capturing race.

The rule of thumb: *always fill up the outer liberties before filling up the common liberties*. For capturing races involving only one common liberty, the possible results are the same as those without any common liberties.

Next, we continue our investigation into capturing races involving two or more common liberties. Still remember what is the third possible outcome of a capturing race? Take a look at Diagram 10-9. Black and white have the same number of outside liberties, and two common liberties.

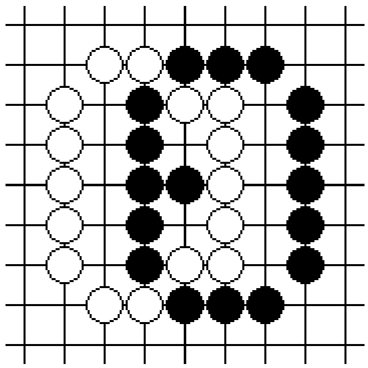

Diagram 10-9

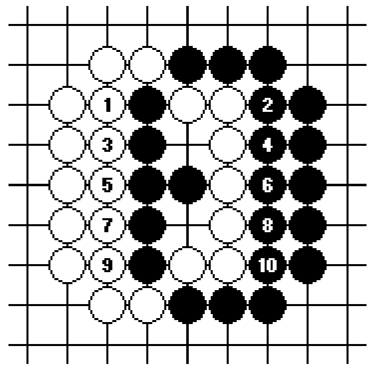

Diagram 10-10

We assume that white plays first, resulting in Diagram 10-10, which is a seki. The same result will occur if black plays first instead. Why? It is the common liberties that caused the seki.

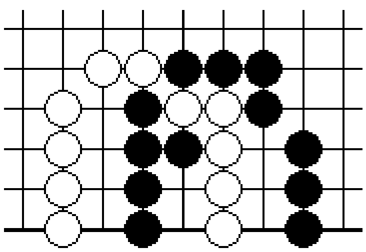

Diagram 10-11

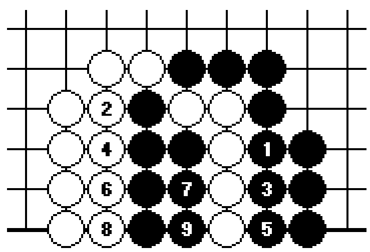

Diagram 10-12

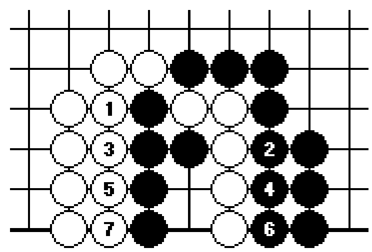

Diagram 10-13

Diagram 10-11 shows the case when there are two common liberties, but black has one more liberty than white. If black goes first, he wins the capturing race as shown in Diagram 10-12. Otherwise, a seki results in the sequence shown in Diagram 10-13.

Things get more complicated when the number of common liberties increases, but there is a pattern: *to ensure that one party wins the capturing race, the difference in the outer liberties of the two groups must be at least the number of common liberties*.

10.4 Eyes And Common Liberties

The pattern stated in the previous section is perfectly valid, with an exception. That is, the groups in question contain no eyes. Once we have groups containing eyes, we must change the way we count liberties.

We shall begin with Diagram 10-14, where both parties have three liberties each. It seems that the party that plays first will win the capturing race.

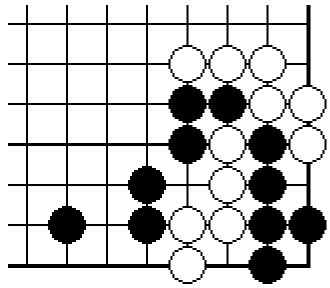

Diagram 10-14

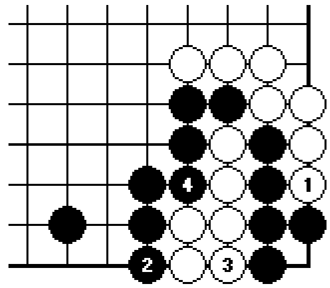

Diagram 10-15

Let's say that white has the initiative here and proceeds as shown in Diagram 10-15. White 1 fills up the outer liberty of the black group, and black 2 follows suit. Because of the presence of the eye, white must play at 3 (the common liberty) in order to reduce black's liberties, but in the process, reduce one of his own liberties. Thus, black 4 will capture the white group. Effectively, black has already won the capturing race in Diagram 10-14, despite having the same apparent number of liberties.

When one group has an eye and the other group doesn't, in the ensuing capturing race, the party without the eye must fill up the common liberties in the process of reducing the liberties of the opponent's group. *In this respect we can say that the common liberties are solely "owned" by the group with the eye.* Hence, in Diagram 10-14, black has three liberties (one outer liberty, one common liberty, and one liberty in the eye), but white has only two liberties (two outer liberties, and the common liberties don't count).

For the case where both groups in question have an eye each, it is preferable for you to do manual counting and not rely on results. Isn't there simply too many things to remember in life? Still, we will examine the number of liberties in a multiple-space eye next.

10.5 Counting Liberties In Multiple-Space Eyes

Like in Lesson 6 titled "Multiple-Space Eyes", we will want to make two assumptions about the multiple-space eyes we are discussing in this section:

- All the stones that make up the multiple-space eye must be *solidly connected in a chain*.
- The eye *must not be in the corner*.

To simplify things, we shall limit our liberty counting to that inside the eye only, and ignore all exterior liberties that are outside the eye.

The process of counting liberties is much like the ritual we did in Lesson 6 when we proved why certain types of multiple-space eyes are considered dead, and we shall begin with the two-space eye in Diagram 10-16.

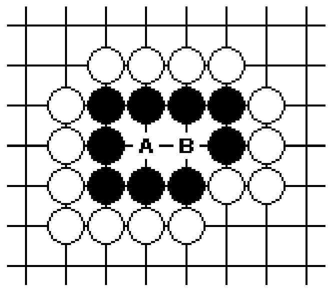

Diagram 10-16

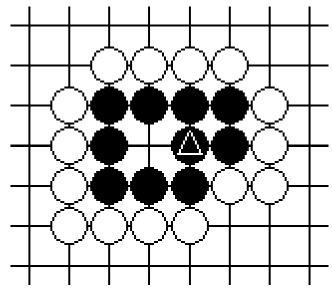
Diagram 10-17

It has *two liberties* at A and B, nothing really special. When white fills up the liberty at A, black should never play at B to remove the stone at A, resulting in Diagram 10-17, in which white can make an immediate capture of the black group. In analyzing the difference, we find that when black plays at B, this move is not used to reduce white's liberties during the capturing race, and instead it is used as a response as white A. Thus, the effect of black playing at B is to reduce its own liberties by one.

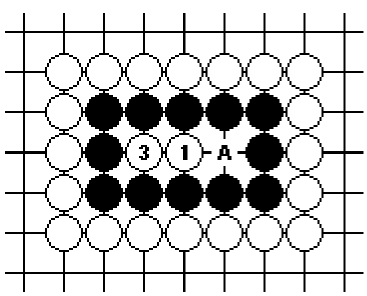

Diagram 10-18

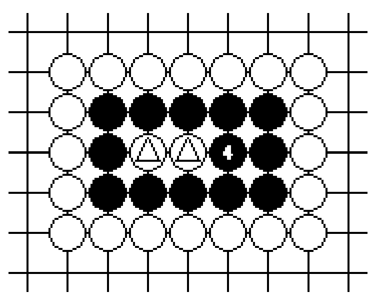

Diagram 10-19

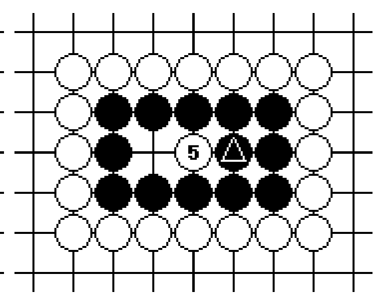

Diagram 10-20

We move on to the three-space eye, as shown in Diagram 10-18. It doesn't matter whether the eye is a straight three or bent three, so long the eye occupies three spaces. White 1 and 3 reduces black's liberties and ataris the black group (black 2 is played elsewhere). If black allows white to make the capture at A, then we can say that white has taken three moves to capture black. However, if black plays at 4 and captures the marked stones as shown in Diagram 10-19, white will still atari the black group with 5 as shown in Diagram 10-20, with the same net result. Hence, we conclude that a three-space eye has *three liberties*.

A four-space eye has *five liberties*. What, not four? We shall show the sequence in filling up liberties in Diagram 10-21. White 5 makes an atari, black 6 makes a response, and white plays at 7 in Diagram 10-22. Black is now left with two liberties (a three-space eye with one liberty filled up). Next we count the number of moves white have made. We count moves 1, 3 and 7 (note that white 5 forces a response at black 6, so we don't count this move), a total of three moves, and thus a reduction of three liberties. Add them up and we have five liberties for a four-space eye.

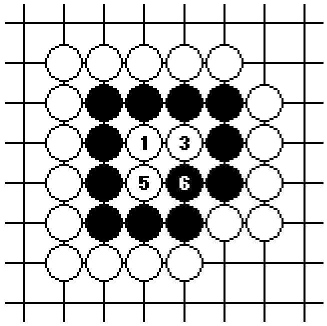

Diagram 10-21

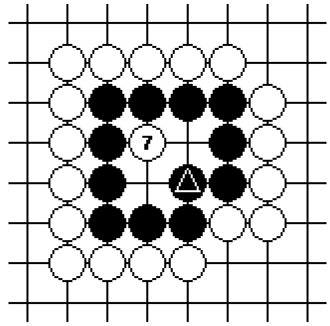

Diagram 10-22

In a similar fashion, we can argue that a five-space eye has *eight liberties*. In Diagram 10-23 and Diagram 10-24, we see that white 7 forces black 8 to remove four stones from the board. White has reduced four black liberties of black by playing at 1, 3, 5 and 9, and now black has four liberties left (a four-space eye with one less liberty). Summing them up we have a total of eight liberties.

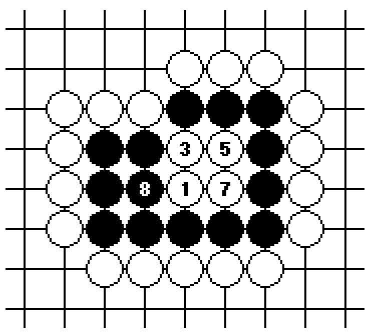

Diagram 10-23

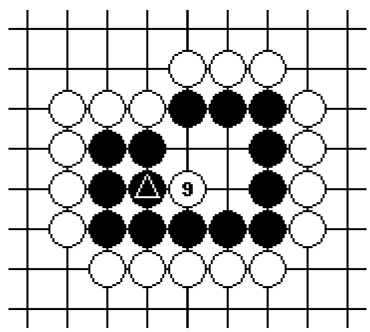

Diagram 10-24

A six-space eye has *twelve liberties* inside the eye. Diagram 10-25 and Diagram 10-26 shows white 1, 3, 5, 7 and 11 reducing five liberties, with seven liberties remaining.

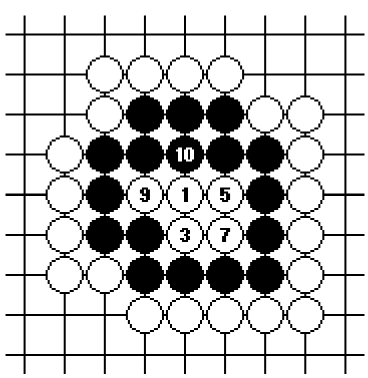

Diagram 10-25

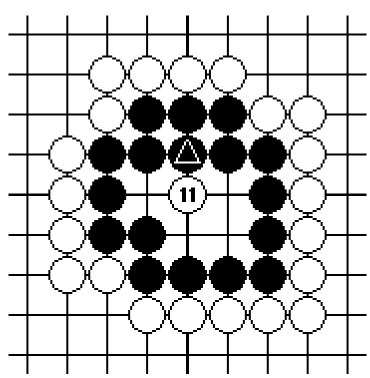

Diagram 10-26

As noted in the beginning of the section, we made two assumptions in deriving the number of liberties in a multiple-space eye. If any of the assumptions are not met, it is very likely that the actual number of liberties will be much less than the derived numbers. Detailed discussion is outside the scope of this lesson, but two examples will be shown below.

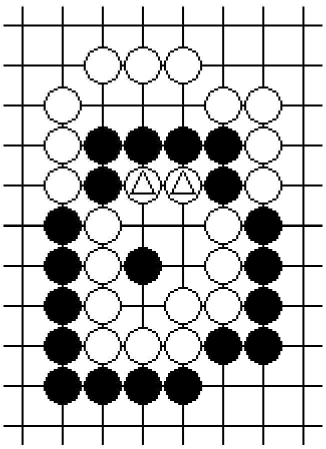
Diagram 10-27

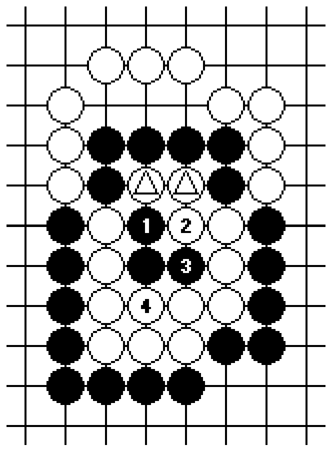
Diagram 10-28

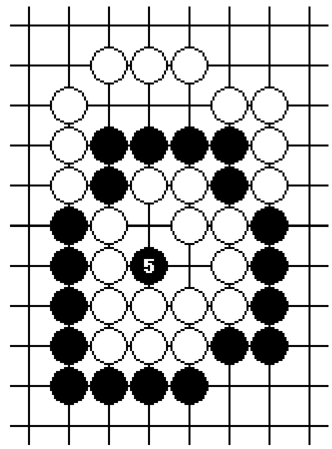
Diagram 10-29

We make a study of Diagram 10-27, which violates the assumption of having all the stones in a chain. With the two marked stones not solidly connected to the rest of the bulky five, white definitely does not have seven liberties. Assuming black first, following the sequence as shown in Diagram 10-28 and Diagram 10-29, black 1 ataris the marked stones, forcing white to connect at 2, and making another atari at 3, forcing the response at 4, and black makes the placement at 5. White is now left with only two liberties.

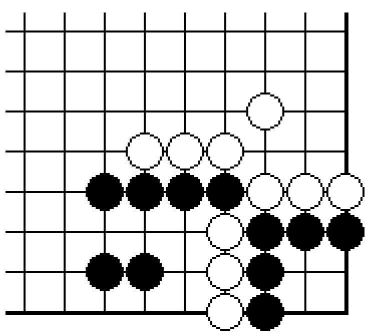
Diagram 10-30

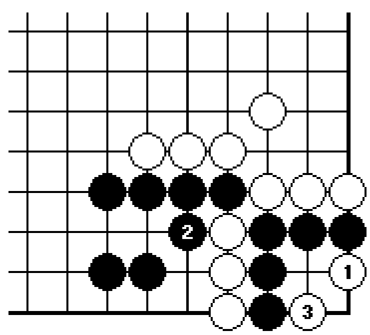
Diagram 10-31

Next we show an example of a multiple-space eye at the corner. Diagram 10-30 shows a bulky four, but it has only three liberties, not five. If white plays at 1 and 3 in Diagram 10-31, black can do nothing to increase his liberties.

10.6 Shortage Of Liberties

Shortage of liberties is a term used to describe the case that one party finds that a necessary move he needs to make will put himself under atari.

We have already encountered one such case back in section 10.4. We take a good look at Diagram 10-15, and we realize that white can't play at 3 to fill up black's liberty as white will put himself under atari. We can say that white is caught with a shortage of liberties.

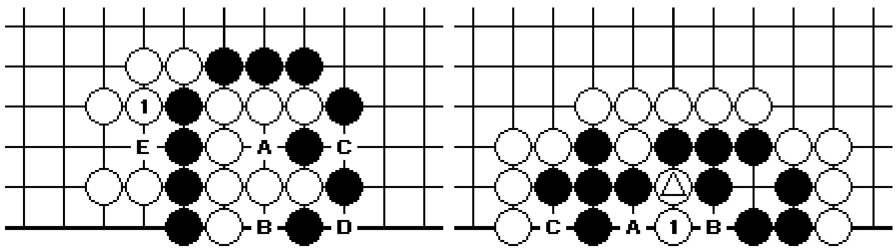

Diagram 10-32 **Diagram 10-33**

In Diagram 10-32, when white plays at 1, black suddenly realizes that he can't fill up white's liberties at either A or B, being caught with a shortage of liberties. By the time black plays at C (or D), white is one step ahead and plays at E, winning the capturing race.

In Diagram 10-33, white 1 descends to the edge, and black suddenly finds that he is unable to play at either A or B to capture the two white stones. With a shortage of liberties, black can only witness the death of the group (white can play at C to capture the five stones). This is a famous case known as *double shortage of liberties*.

[More Stuff] – Go Playing Programs

There are many programs out there that allow a human Go player to play against the computer. For the beginner, many of these are great learning tools. The Singapore Weiqi Association's website (http://www.weiqi.org.sg/) contain a good number of links to software vendors that produce quality Go playing applications, many of which are freely downloadable. Some of the others are shareware, and there are also those that require you to pay upfront.

Due to the complexities inherent in the Go game itself, the best Go playing applications are only ranked in the amateur Kyus, given the current computing power available. This is quite unlike Chinese Chess and International Chess, where professional level applications have been written. It still remains a challenge to develop a Go playing application that can beat a professional 1 Dan player in an even game. We shall wait and see when this happens.