

## Example:

```

void foo(int a, int b, int* pMin, int* pMax) {
    if (a < b) {
        *pMin = a;
        *pMax = b;
    } else {
        *pMin = b;
        *pMax = a;
    }
}

```

```

// Function foo puts the smaller of a and b
// into pMin's pointee. It puts the larger
// of a and b into pMax's pointee.

```

**Memory allocated**

	<u>by main</u>		<u>when foo is called</u>
<pre> void main() {     int r = 23;     int s = 8;      int min;     int max;      foo(r, s, &amp;min, &amp;max); } </pre>	<div style="margin-bottom: 10px;">r <span style="border: 1px solid black; padding: 2px 10px;">23</span></div> <div style="margin-bottom: 10px;">s <span style="border: 1px solid black; padding: 2px 10px;">8</span></div> <div style="margin-bottom: 10px;">min <span style="border: 1px solid black; padding: 2px 10px; color: red;">8</span></div> <div style="margin-bottom: 10px;">max <span style="border: 1px solid black; padding: 2px 10px; color: red;">23</span></div>	<div style="margin-bottom: 10px;">a <span style="border: 1px solid black; padding: 2px 10px; color: blue;">23</span></div> <div style="margin-bottom: 10px;">b <span style="border: 1px solid black; padding: 2px 10px; color: blue;">8</span></div> <div style="margin-bottom: 10px;">pMin <span style="border: 1px solid black; padding: 2px 10px;"></span></div> <div style="margin-bottom: 10px;">pMax <span style="border: 1px solid black; padding: 2px 10px;"></span></div>	

The **purple** happens because of the four declarations in *main*: declaring variables allocates space (i.e., creates boxes). At this point, the boxes for the variables *min* and *max* (in *main*) are still empty (which means that those variables contain garbage).

The **blue** happens when *foo* is called.

- Space is allocated for the parameters: *a*, *b*, *pMin* and *pMax*.
- Those parameters are assigned values by copying the bits of the actual arguments (*r*, *s*, *&min* and *&max*) into the parameters.

The **red** happens when the *body of foo* runs.

- That body sets *pMin's pointee* to the smaller of *a* and *b* (here, that is 8) and *pMax's pointee* to the larger of *a* and *b* (here, that is 23).
- Since those pointees are the same boxes that the variables *min* and *max* in *main* refer to, respectively, the *min* and *max* variables in *main* are changed by the call to function *foo*. Thus, this example illustrates how to send information back from a function to the caller by using pointers.

Finally, just to illustrate pointer assignment, suppose that *foo* had (for no good reason) the statement `pMin = pMax`. That would cause the *arrow* from *pMin* to point to the same place that the arrow from *pMax* points to, namely, to *max's* box.

***If you have questions about the above example, please ask now!***