



Welcome back Meta-Traders.

Indicators are an amazing thing in Meta-Trader.

Whatever conditions you dream up can be turned into an indicator that either calculates a value and paints a line or draws an arrow, or display some other type of object.

Drag the indicator from the navigator view onto a chart, and the indicator will be calculated on the chart. The indicator on the left draws a red arrow above the bar on a "bearish engulfing" candle, and a blue arrow below the bar on a "bullish engulfing" candle pattern.

Recall that bullish engulfing condition occurs when the real body of the candle exceeds or "engulfs" the prior candle.

Indicators are very easy to code.

First you declare an array of doubles for each indicator to be calculated. In our case, we need 2 arrays:

```
//---- buffers  
double LowerLine[];  
double UpperLine[];
```

Each array position simply holds the indicator's value for that bar. In the case of drawing arrows, the array position contains the approximate price value where the arrow should be drawn.

Next, in the Init() function, calls these functions to associate the array with the on-screen indicator. It also sets the style of the indicator (Line or Arrow):

```
//---- indicators
SetIndexStyle(0, DRAW_ARROW, EMPTY);
SetIndexArrow(0, 233);
SetIndexBuffer(0, LowerLine);

SetIndexStyle(1, DRAW_ARROW, EMPTY);
SetIndexArrow(1, 234);
SetIndexBuffer(1, UpperLine);
```

Then inside the start function, use this code:

```
/* Calculate range for arrow drawing */
for(nCount=i; nCount <= i+9; nCount++) {
dAverageRange = dAverageRange + MathAbs(High[nCount]-Low[nCount]);
}
dAverageRange = dAverageRange/10;

/* Check for bearish engulfing */
if (Close[i] < Open[i] && Open[i] > MathMax(Open[i+1],Close[i+1]) && Close[i] <
MathMin(Open[i+1],Close[i+1])) {

UpperLine[i] = High[i] + dAverageRange*0.3;
}

/* Check for bullish engulfing */
if (Close[i] > Open[i] && Open[i] < MathMin(Open[i+1],Close[i+1]) && Close[i] >
MathMax(Open[i+1],Close[i+1])) {
LowerLine[i] = Low[i] - dAverageRange*0.3;
}
```

The code on the top simply calculates the 10-bar average of the range for the sole purpose of calculating how far the arrow should go above or below the price bar. The code below checks for the 3 conditions required for a bullish engulfing pattern:

Higher Close  
Real Body top is above prior real body top  
Real Body bottom is below prior real body bottom