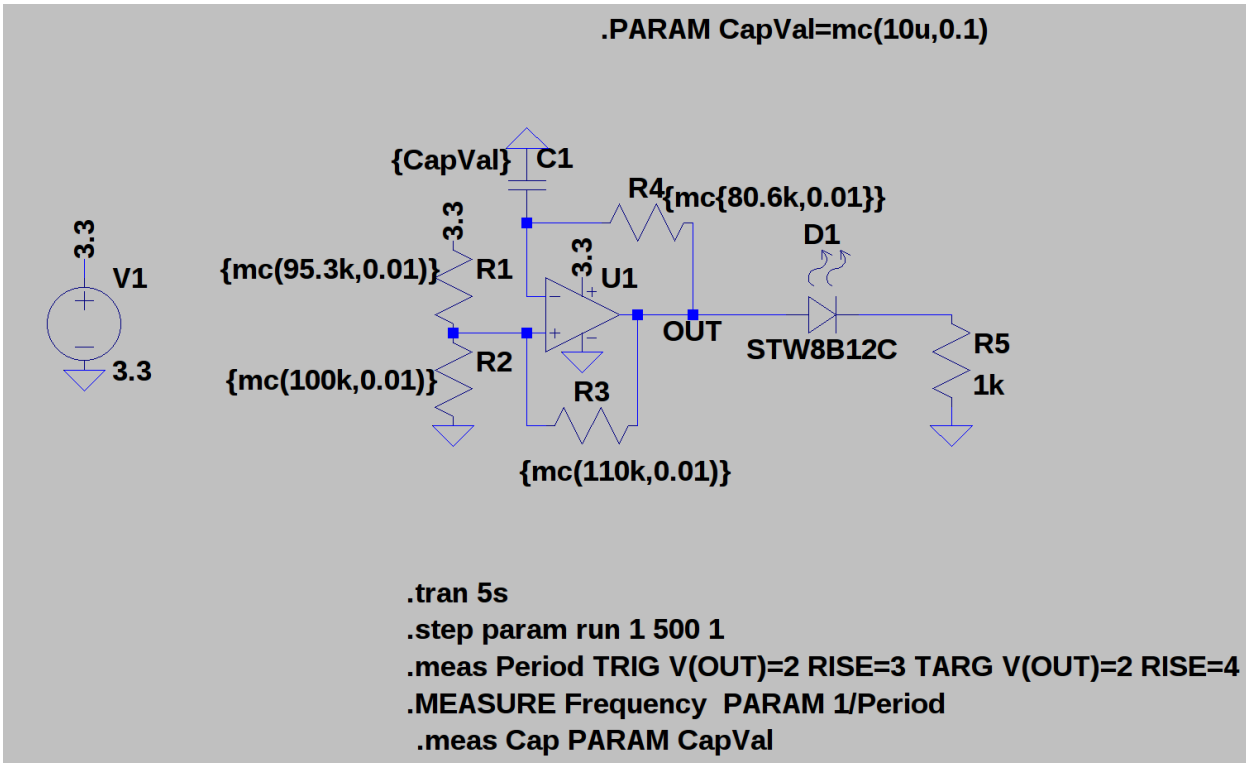
Sensitivity Analysis for blinking light

I analyzed the frequency of the circuit and its sensitivity to manufacturing tolerance using LTspice.
In the diagram below, mc(x,μ) represents an unknown value in the range [x(1-μ) ... x(μ)], so mc(110k, 0.01) is the tolerance band on a 1% 110kΩ resistor.



Analysis

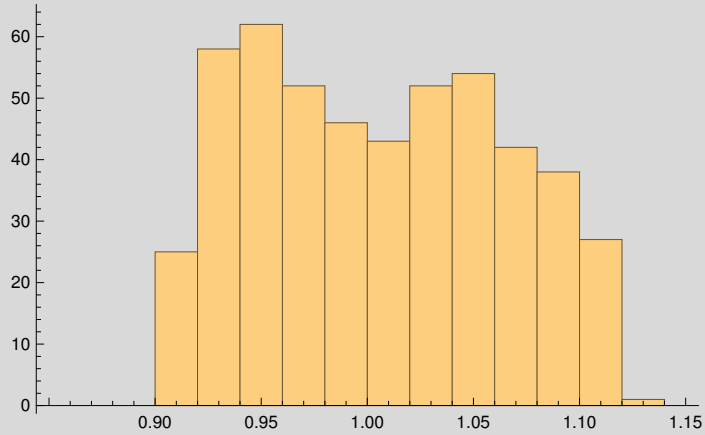
```
SetDirectory@NotebookDirectory[];
{n, cap, freq, pd} =
  Transpose[Import["LTspice/freq_data.txt", "Data"][[2 ;; All]]];
Length[
 freq]
```

```
500
```

```
MinMax[freq]
```

```
{0.901583, 1.1204}
```

```
Histogram[freq, PlotRange → {{0.85, 1.15}, Automatic}]
```



As required, the frequency always falls within 1hz ± 15%.

Additional analysis reveals that the variability in frequency is almost entirely determined by the capacitor.

```
ListPlot[Transpose@{cap * 10^6, freq},
 AxesLabel → {"C1 value (μF)", "Frequency (hz)"},
 PlotRange → {{9, 11}, {.85, 1.15}}]
```