# MAT180 HW04

(ADD NAME)

Due 4/29/23 at 11:59 pm on Gradescope

Reminder Your homework submission must be typed up in full sentences, with proper mathematical formatting. The following resources may be useful as you learn to use TeX and Overleaf:
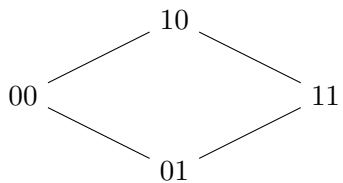
- Overleaf's introduction to LaTeX:
  https://www.overleaf.com/learn/latex/Learn_LaTeX_in_30_minutes

- Detexify:
  https://detexify.kirelabs.org/classify.html

Exercise 1

Let H denote the following diagram of the (unoriented) Hopf link:
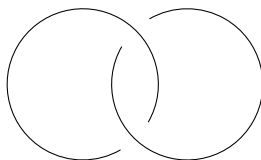
(a) Draw the *cube of resolutions* for the diagram above. That is, replace the binary strings below with the associated smoothings of the diagram:

Remark. The cube of resolutions can be viewed as a graph representing the partially ordered set $\{0,1\}^n$ where the bit string $a = a_1 a_2 \ldots a_n \leq b_1 b_2 \ldots b_n$ iff for each i, $a_i \leq b_i$.

(b) Compute the Kauffman bracket polynomial $\langle H \rangle$.

(c) Use your computation of $\langle H \rangle$ to compute the Jones polynomials of the positively linked Hopf link H^+ and the negatively linked H^- in terms of the variable q.