

**MATH-CCTH 1080H – Mathematics for Everyday Life**  
TRENT UNIVERSITY, Winter 2018 in Peterborough

**Assignment #5**

**Faking fairness**

*Due on Friday, 16 February.*

1. You are stuck on a desert island with a friend and single coin which is your only source of randomness. [Deterministic desert islands are very boring!] The coin in question is biased in that it comes up heads more often than tails, though you do not know the exact bias. (It does come up tails some of the time.) You and your friend want to play a game that needs a fair coin. How could you use the biased coin to simulate the fair coin that you need? [10]

**For One Who Loves An Engineer**

Sing not to me of silicon chips  
The chocolate kind are sweeter  
But sweeter still would be your lips –  
Put down that voltage meter!

A jug of wine (viscosity 3),  
Loaf of bread (shear modulus 7)  
But me you cannot quantify –  
Oh, glory be to heaven!

*Miriam Nadel*

Mathematicians are like lovers. . . . Grant a mathematician the least principle, and they will draw from it a consequence which you must also grant, and from this consequence another.

*Bernard le Bovier Fontenelle*