



YMC 2006



Young Mathematicians Conference 2006

August 4th-6th at The Ohio State University.

UNIVERSAL CYCLES OF A MULTISSET

Joshua N Zahl & Tobias L Johnson

ETSU [Mentor: Anant Godbole]

Abstract of Report Talk: Consider the collection of all t sized multisets of a set $\{1, \dots, n\}$. A *universal cycle* on t, n is a string of numbers from $1, \dots, n$ in which every t sized multiset of $\{1, \dots, n\}$ appears precisely once. For instance, when $t = 2$ and $n = 3$, we have the six multisets $\{11\}, \{22\}, \{33\}, \{12\}, \{13\}, \{23\}$. We consider the six two-digit sequences contained in the string 112233, allowing the sequence to wrap around at the end; these six sequences are exactly the six multisets listed above, so 112233 is a universal cycle for $n = 3, t = 2$. In 2004, Godbole used an inductive proof to show that for $t = 2$, universal cycles exist precisely when $n \geq 3, n$ odd. We consider the case $t = 3$, and also examine how a proof for the $t = 3$ case can be generalized to all values of t . [ZJ14123013]

Contact: josh@caltech.edu & toby.johnson@yale.edu

Received: July 20, 2006