Undergraduate Problem Solving Competition
Problem 2 - Busy Beaver Catastrophe

Due Oct. 17, 2017

The busy beaver game is played on a simple sort of Turing machine, where the input can be presented on a series of index cards, each card holding 8 values. Watch "Busy Beaver Turing Machines - Computerphile" (https://www.youtube.com/watch?v=CE8UhcyJS0I) By Computerphile on Youtube for a more thorough introduction.

The score of an input is the sum of all 1's printed after the program terminates. The two card busy beaver machine input below would carry out as follows, resulting in a score of 2:

Card 1					Card 2			
0	1	1	2		0	1	0	1
1	1	0	0		1	1	0	1

Reading Card:	Array and Position							
Begin				v				
1	...0	0	0	0	0	0	0	0...
				v				
2	...0	0	0	1	0	0	0	0...
				v				
1	...0	0	0	1	1	0	0	0...
Terminate			v					
0	...0	0	0	1	1	0	0	0...

For your solution, present a 3-card busy beaver input that terminates with a score of 6. Your solution should be presented in the form of 3 filled out cards:

Card 1					Card 2					Card 3			
0	1	1	2		0	1	1	1		0	0	1	2
1	1	0	1		1	1	0	3		1	1	1	0

New and old problems are posted online at http://www.math.utah.edu/ugrad/pscontest
Next problem will be posted Nov. 6, 2017.
For answer to problem 1, research "Binary skew".

In the spirit of UPSC, you should not use the internet (**beyond the single Youtube video**) or look up the solution in a book. Please include your **name, student ID number, and email address** on your solution. Submit answers at the front desk of the T. Benny Rushing Mathematics Center.