

2014-15 University of Utah Undergraduate Problem Solving Contest

Problem 4

Due February 4, 2015

Suppose a jar contains R red marbles and B blue marbles, where $R > B$. The marbles are well mixed, then removed from the jar by selecting one marble at a time, at random, without replacement, until all the marbles are removed. What is the probability that the total number of Red marbles removed will always be *strictly* greater than the total number of Blue marbles removed *after every selection*? Remember, ties are not allowed.

In the spirit of UPSC, you should not use the internet or look up the solution in a book. Please include your **name, student ID number, and email address** on your solution. Grading will proceed more quickly if your final answer is written clearly at the beginning of the first page of your solution, followed by your work and justification.