Submissions: This assignment is due at 11:59 PM on the 20th of March, 2019. Each student must submit his or her own assignment. This is a programming assignment. You have to submit code that can be run on a computer. You can use Java, C, C++ or Python to write code. In any case, your submission should be a single file containing your code (not compiled code), and any relevant instructions to compile or run your code as comments. The main interactive session should ask the user which problem they would like to solve. Then, depending on the choice, it presents the user with the appropriate input menu, and proceeds to present the solution after the input is done. The input/output format for each problem is specified with the problem. For the input format, you may assume the format will be absolutely as specified, i.e., you do not need to check for errors in the input format. For the output, your code must output its results on the standard output in the strict format desired of it (and nothing else).

Academic Integrity: You are encouraged to work in groups, but everyone must write his/her own code. Absolutely no copying is allowed. Please refer to the course policies and schedules about this. If you have worked with other students on the assignment or referred to external sources, please mention all names and sources on your assignment.

Problem 1[50 pts]: Write a program that prompts the user to enter two positive integers named $a$ and $b$. Then, output the Bezout coefficients of $a, b$. Recall that the Bezout coefficients are (any) integers $s, t$ such that:

$$as + bt = \gcd(a, b).$$

Problem 2[50 pts]: Write a program that prompts the user to enter three positive integers $a, b, n$. Then, output the general form of solutions to the congruence equation $ax \equiv b \pmod{n}$ if there is such a solution. If there is no solution output “NO SOLUTION”.

For example, suppose I enter $a = 2, b = 3, n = 6$ the output should be “NO SOLUTION”. If on the other hand, I enter $a = 2, b = 4, n = 6$ then the general solution is $x \equiv 2 \pmod{3}$ so your program outputs $x = 2 \pmod{3}$. 