# Practice Questions for COL100
# 2017-18 I$^{st}$ Semester

Q1. Randomly pick 5 numbers in decimal in the range 0 to 32767 and them from decimal to binary.

Q2. Convert the binary numbers obtained in Q1 back into decimal.

Q3. Convert the binary numbers obtained in Q1 into octal (base 8 representation).

Q4. Can you think of a very fast method to convert binary numbers directly into octal (base 8), without converting them to decimal first?

Q5. Add 44 (base 8) to the octal numbers obtained in Q4.

Q6. Convert the octal numbers obtained in Q5 back into binary.

Q7. Can you think of a very fast method to convert the octal numbers into binary representation without converting them into decimal?

Q8. Generate three numbers in the range 0 to 10000. Randomly pick three bases in the range 3 to 9. Convert these numbers from decimal to randomly selected bases.

Q9. Add the above three numbers obtained in Q9 in their respective bases.

Q10. Convert the above numbers from their respective bases back to decimal (base 10) and compare the results after adding the original numbers (of Q8) in base 10.

Q11. Generate two positive numbers in the range 0 to 1000. Convert them into base 2, add them in base 2 and convert the results back into base 10.

Q12. Repeat Q11 with base X instead of base 2 where X is randomly chosen in {3,4,..,9}.

Q13.Generate two negative numbers in the range (-10000, 0). Convert them to 2’s complement binary notation (16 bits). Add them in binary and convert the result back into decimal.

Q14. What is the 1's compliment of the following binary number: 0001110101011010?

Q15. What is the 2’s complement of the following binary number: 0011001010101011?