2.
Binary Systems and Codes

2.3.
(r-1)'s Complement

Assignments

1. Write short notes and explain in your own words the definition and usage of $(r-1)$'s complement.

In the remaining assignments you will be using NumbersAPI to generate numbers, in particular, its trivia API. Open the following link in an internet browser of your choice to get a random number between 42 and 555: http://numbersapi.com/random/trivia?min=42&max=555
(For the record, 42 is the angle in degrees for which a rainbow appears or the critical angle. 555 is the number of seats of the airliner A380-800. :-)) To generate a new number, just refresh the page. Make sure to learn by heart the trivia you especially like :-)

2. Generate a couple of numbers using NumbersAPI trivia. Treat each of them not as a decimal numeral but as a numeral in a particular base which you will choose. If the generated numeral does not contain the digit 9 pick the smallest possible base as the chosen base of that numeral. If the digit 9 appears in the numeral pick any base between 11 and 20. Afterwards, calculate the $(r-1)$'s complement for each of the generated numerals assuming the numeral has at least three digits.
   E.g., 62 is the number which Sigmund Freud has an irrational fear of.
   $(062)_7 \rightarrow (603)_7$
3. Write down a couple of arbitrary binary numerals and calculate their 1's complement.