Hypergeometric functions play a significant role on solving linear differential equations with regular singularities. Gauss hypergeometric function, also known as $2F_1$ function, is a solution of the second order linear differential equation:

$$ x(1 - x)y'' + (c - (a + b + 1)x)y' - aby = 0, $$

also called Gauss hypergeometric differential equation which has 3 regular singularities at $x = 0, 1, \infty$. Based on this property, we develop algorithms to find hypergeometric solutions of differential equations which have (i) $n$ regular singularities, or (ii) solutions with specific degree $d$.

In this presentation we will talk about our algorithm designed to find hypergeometric solutions of second order linear differential equations with 5 regular singularities, at least one logarithmic. (Received September 20, 2016)