My name is Ram Murty and I am the A.V. Douglas Distinguished University Professor in the Department of Mathematics and Statistics at Queen's University.

My research focuses on number theory with special emphasis on the theory of zeta and $L$-functions, sieve theory and algebraic number theory. I am also interested in spectral graph theory and its emergent applications to (neural) network theory.

Project 1: Classical number theory focuses on arithmetical functions of a single variable. Current number theory now realizes the importance of the study of arithmetical functions of several variables and their associated Dirichlet series of several complex variables. One of my projects is to extend the classical theory of a single variable to the multi-variable context. Some of my recent papers represent a modest beginning in this direction.

Project 2: Graph theory is a powerful tool to analyze many problems confronting the human race. It is a profound method to represent complicated processes which allows for the introduction of mathematical tools to be applied to "real world" problems. This is evident in what is now called "network theory". Spectral graph theory exhibits analogies with the theory of zeta functions in number theory. Thus, this analogy can be used to discover new theorems in graph theory. A viable research project is to re-visit classical graph theory in the light of modern problems arising from technologies, environments and other biological processes with a view to understand and solve them.

Project 3: Probability theory is often studied as a branch of mathematics divorced from number theory. In the last century, a new branch of mathematics called probabilistic number theory has taken shape. This theory needs to be expanded into the algebraic realm of the adele ring of global fields and in particular, the Prüfer ring $\widehat{\mathbb{Z}}$. Thus, a third research project can be classified as "adelic probability theory". At present there are only a few papers that have given serious attention to this perspective. Clearly these papers represent a humble beginning of a larger theory yet to be discovered.

If you find any of these projects interesting or would like to hear more about my research, do not hesitate to contact me at murty@queensu.ca