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From the abstract to the concrete

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The earliest memory that I have of studying something I really enjoyed, is learning elementary school algebra from my mother. She was a school teacher, and taught mathematics and French in high school. The year was 1958, and we were about to move from Khadakvasla in Pune, to Jammu, as my father, an officer in the Indian army, was posted to Surankote, a small town on the border between India and Pakistan. I had to be coached for the next class, having missed six months of school. I remember the pleasure of being able to convert a problem into an abstract formulation, using variables for unknowns, and then actually getting the answer by solving simple equations. It appeared magical at that time.

A few years later, we moved back to Pune again, and I joined Fergusson College. I later went on to IIT Delhi, where I completed my BTech in electrical engineering in 1968. I was in fact, the first woman electrical engineering graduate of IIT Delhi!

In 1968 I left for the U.S.A., to begin graduate studies in the department of electrical engineering at the University of Maryland in College Park. Among the courses I took, I was particularly fascinated by one on error correcting codes. It was a beautiful ap-

plication of abstract algebra to the very practical problem of reliable communication. I decided to work in this area for my PhD, which I finished in 1972.

I returned to India in 1973, and was appointed assistant professor in the School of Automation, a relatively new department at the Indian Institute of Science. There were very few faculty members in the department then, and we carried fairly heavy teaching loads. I greatly enjoyed interaction with the students, and it was wonderful to see a fresh set of faces every year.

In 1974 I married P.N. Shankar, a theoretical fluid dynamicist. We had met while I was a graduate student, and he had returned to India in 1972, to join the National Aeronautical Laboratory, Bangalore. I took a break from work after the birth of our son Nachiket in 1976, and then again after our daughter Mridula was born in 1983.

I spent the first few years designing and teaching new courses, among them courses in formal languages and compilers. While at Maryland I had taken a course on the theory of computation, where I first learned of the work of Noam Chomsky and Alan Turing, and the existence of undecidable problems. The application of automata theory to compilers was an elegant illustration of the process by which an abstract specification could generate a concrete implementation of a complicated piece of software. I continued to work in coding theory as well as in the design and development of practical compiler tools. In 2002 a colleague and I edited the first handbook on compilers.

Raising our children took up much of my time outside working hours, and managing the house as well as my duties at work was a tightrope walk which I managed with support from my husband and my parents.

I often wonder whether I would have lived my professional life any differently were I to start all over again. I think not. I've pretty much done what I wanted to, most of my life. I consider myself very lucky to have been born into an enlightened family where independent thinking was encouraged, and to be associated with an institution where complete academic freedom is given to faculty members.