# The Early Life of Alan Turing

Alan Turing, born on June 23, 1912, in London, England, was a prodigious talent whose early life laid the groundwork for his monumental contributions to mathematics, computing, and cryptography. From a young age, Turing exhibited a remarkable aptitude for mathematics and science, which set him apart from his peers. His parents, recognizing his potential, ensured he received a robust education that would nurture his intellectual abilities.

Turing's formal education began at Sherborne School, a prestigious boarding school in Dorset. Despite facing challenges in adapting to the school's rigid classical curriculum, Turing's passion for science and mathematics flourished. He often conducted scientific experiments at home, demonstrating an early inclination towards practical problem-solving and innovation.

In 1931, Turing entered King's College, Cambridge, where he pursued a degree in mathematics. His time at Cambridge was transformative, as he was exposed to the forefront of mathematical thought and research. Turing's brilliance was soon recognized, and he was elected a Fellow of King's College in 1935, a rare honor for someone so young. During his tenure at Cambridge, Turing developed the foundational concepts of what would later become known as computer science.

One of Turing's most significant early achievements was his 1936 paper, "On Computable Numbers, with an Application to the Entscheidungsproblem." In this groundbreaking work, Turing introduced the concept of a theoretical computing machine, now known as the Turing machine. This abstract device could simulate the logic of any computer algorithm, laying the theoretical foundation for modern computers.

Turing's academic journey continued at Princeton University, where he studied under the renowned mathematician Alonzo Church. In 1938, he completed his Ph.D. in mathematical logic, further solidifying his reputation as a leading thinker in the field. Turing's early academic achievements and innovative ideas set the stage for his later work in cryptography and artificial intelligence, making him one of the most influential figures in the history of computing.

Turing's early life was marked by a series of personal and academic milestones that shaped his future contributions. His parents, Julius and Ethel Turing, were supportive of his intellectual pursuits, although their frequent travels due to Julius's work in the Indian Civil Service meant that Turing and his older brother, John, spent much of their childhood in England under the care of relatives and family friends. This separation from his parents may have contributed to Turing's independent and introspective nature.

At Sherborne School, Turing's unconventional approach to learning sometimes put him at odds with the school's traditional methods. Nevertheless, his natural curiosity and determination drove him to excel in subjects that interested him. He developed a close friendship with Christopher Morcom, a fellow student who shared his passion for science. Morcom's untimely death in 1930 deeply affected Turing, but it also motivated him to pursue his scientific interests with even greater fervor.

During his time at King's College, Turing was influenced by the intellectual environment and the prominent mathematicians he encountered. His work on the Entscheidungsproblem, which addressed the limits of what can be computed, was a direct response to the challenges posed by David Hilbert's decision problem. Turing's innovative approach to this problem not only earned him recognition but also laid the groundwork for the development of theoretical computer science.

Turing's move to Princeton University allowed him to collaborate with Alonzo Church, whose work on lambda calculus complemented Turing's own research. Their combined efforts advanced the understanding of computation and formal systems. Turing's Ph.D. thesis, "Systems of Logic Based on Ordinals," further explored the mathematical foundations of computation and introduced concepts that would later influence the development of programming languages and algorithms.

In addition to his academic pursuits, Turing was an avid long-distance runner, often using his training sessions as a way to clear his mind and think through complex problems. His physical endurance and mental resilience were qualities that would serve him well in his later work, particularly during World War II when he played a crucial role in breaking the German Enigma code.

Turing's early life was characterized by a relentless pursuit of knowledge and a willingness to challenge established norms. His groundbreaking work in mathematics and logic laid the foundation for the digital age, and his contributions continue to influence the fields of computer science, artificial intelligence, and cryptography. Despite facing personal and professional challenges, Turing's legacy endures as a testament to the power of innovation and intellectual curiosity.