Redundant Arrays of Independent Disks (RAID) systems are into widespread use because of their enhanced I/O bandwidths, large capacities, and low cost. However, the increasing demand for greater array capacities at low cost has led to the use of arrays with larger and larger number of disks, which increases the likelihood of the concurrent occurrence of two or more random disk failures. Hence the need for RAID systems to tolerate two or more random disk failures without compromising disk utilization. In this talk, we will present a novel algorithm based on the perfect 1-factorization of the complete graphs $K_p$ and $K_{2p} - 1$ for placing data and parity in two-disk fault-tolerant arrays with $(P - k)$ and $(2P - 1 - k)$ disks respectively, where $P$ is a prime number and $k \geq 1$. Furthermore, we determine the fraction of space used for storing parity in such arrays and show that this fraction has the optimal value when $k = 1$. 