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## **Green Computing**

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Abstract: Green computing, or sustainable computing, aims to decrease the environmental footprint of technology by enhancing energy efficiency, reducing e-waste, and encouraging environmentally friendly practices in the IT sector. As concerns regarding energy consumption, e-waste, and resource depletion are on the rise, green computing has become a vital strategy to make technology sustainable. Some of the main areas are energy-efficient hardware, green data centers, sustainable software development, and e-waste management. The utilization of low-power processors, virtualization, and power-efficient algorithms has gone a long way to decrease the energy consumption in mobile phones and data centers. Moreover, practices such as recycling, urban mining, and designing for disassembly are working towards eliminating the growing e-waste issue. Green computing is also aided by policies such as the EU's RoHS and WEEE directives aimed at facilitating green practices in the manufacturing of IT products. Even with the progress, some of the challenges include high initial investment, the absence of standard measures, and the necessity of wider adoption. This paper explains major trends, challenges, and solutions to enhancing green computing practice and emphasizes the need for cross-disciplinary collaborations to promote sustainable technological development.

**Keywords:** Green computing, energy efficiency, e-waste, sustainable technology, software development, data centers, environmental impact



