**Green Software Engineering**

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green software engineering

Green software (also known as green coding, green computing or sustainable software) is a concept that’s been around for a few years. Its focus on minimizing environmental damage through engineering is attracting significant interest among architects, developers and coders wanting to make a meaningful, long-term contribution to saving the planet.

**What Is Green Software Engineering?**

[Green software engineering](https://www.techscience.com/csse/v41n1/44795) is a design concept that says software should be developed and used efficiently and effectively “with minimal to no impact on the environment”.

It includes all facets of a software product’s lifecycle including its design, use, economic, social and ecological impacts. Because of this, green coding has the potential to play an important role in minimizing carbon emissions and improving sustainability programs in small, medium and large businesses.

Green software prioritizes the following design, development and implementation principles:

* It should limit energy consumption
* It should limit its environmental impact
* It needs to include green and sustainable software development practices
* It must include green and sustainable architecture and hardware
* It should reduce greenhouse gas emissions and carbon footprint

**The 2 Green Software Engineering Philosophies**

The principles of green coding are underpinned by the two philosophies of green software engineering:

1. Everyone has a part to play in the climate solution: Nothing happens in isolation, everything is connected, and small changes lead to big changes.
2. Sustainability is enough, all by itself, to justify our work: Sustainable applications are almost always cheaper, are often more performant and often more resilient.

**The 8 Green Coding Principles**

Sustainable software development has traditionally focused on cost, speed and agility rather than its potential to minimize emissions and improve sustainability.

A coordinated effort to agree on a global set of principles and standards for green software has only recently gained momentum through the [Green Software Foundation](https://greensoftware.foundation/); a non-profit organization established in 2021 aimed at developing a network of "people, standards, tooling and best practices for green software”.

The Foundation has developed what’s become recognized as eight fundamental principles for guiding software engineers in their approach to green software development.

The eight principles of green coding are:

1. Carbon: Build applications that are carbon efficient
2. Electricity: Build applications that are energy efficient
3. Carbon Intensity: Consume electricity with the lowest carbon intensity
4. Embodied Carbon: Build applications that are hardware efficient
5. Energy Proportionality: Maximize the energy efficiency of hardware
6. Networking: Reduce the amount of data and distance it must travel across the network
7. Demand Shaping: Build carbon-aware applications
8. Measurement & Optimization: Focus on step-by-step optimizations that increase the overall carbon efficiency.

**The Green Coding Learning Café**

There is 8 flipcharts, each with it’s own green coding principle.

Divide the class equally to each flipchart, around 5 or 6 per chart.

You have 5 minutes to research the green coding principle on the flipchart and add some notes, pictures, words, etc. that adds some more information and details about the principle.

After 5 minutes the groups rotate to the next green coding principle flipchart. The arriving group has 1 minute to get familiar with what is already on the flipchart.

Everyone adds something **new** to the flipchart. It will get difficult as the time progress, but be tenacious try to find something new to add to the flipchart.

Questions to ask about the green coding principle for example are:

* what is meant by this?
* why do it?
* how to do it?
* when to do it?
* who do it?

After everyone have visited all the flipchart we will have a short break kitkat.

After the break the last group at the flipchart will give a summary of the information on the flipchart for everyone.

The group presenting, write their names on the chart, take a picture of the flip chart and paste it to the [Mural board](https://app.mural.co/t/tg5g00ev163001websovelluskeh4798/m/tg5g00ev163001websovelluskeh4798/1677942073671/2393261c8262541ba94c8ae8b7674661c9520768?sender=u9bcbbed311777a14d9149309).

Each group member can add 8 points to the Week 10 - ex1 column for their effort.