Green IT

Reading & Vocabulary Development
for CS50x Learners

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❑ How to Study?

- **Step 1:**

In the first section (Reading), read through the article once completely.
Don't worry about understanding every word—just focus on getting a general sense of the content.

- **Step 2:**

Next, check out the list of words and expressions from the text.
See which ones are familiar to you and which ones are new.
Some unfamiliar words can be guessed from the context, and some familiar ones might have a different meaning here than usual.

- **Step 3:**

In the following sections, you'll find explanations and example sentences for those words and phrases.
Some of them might not appear directly in the article, but since they're related, it's a good opportunity to get to know them.

This process continues throughout the material.
You can study at your own pace, take breaks whenever you need to, and come back to it later.

❑ About the Vocabulary

The vocabulary in this article isn't sorted by language level, but it generally falls into three categories:

1. High-frequency, common words that you'll remember naturally over time through repetition and exposure.

2. Specialized IT and computer terms that will become easier to learn the more you engage with tech-related content.

3. Less common words that you might only see in a few specific contexts.

❖ Important Note

You don't need to memorize any of these words or expressions my friend.
They're just here to support your learning journey.
The more you come across them in different contexts, the more naturally they'll stick.

complete article link

https://greensoftware.foundation/articles/10-recommendations-for-green-software-development

Green Software Foundation

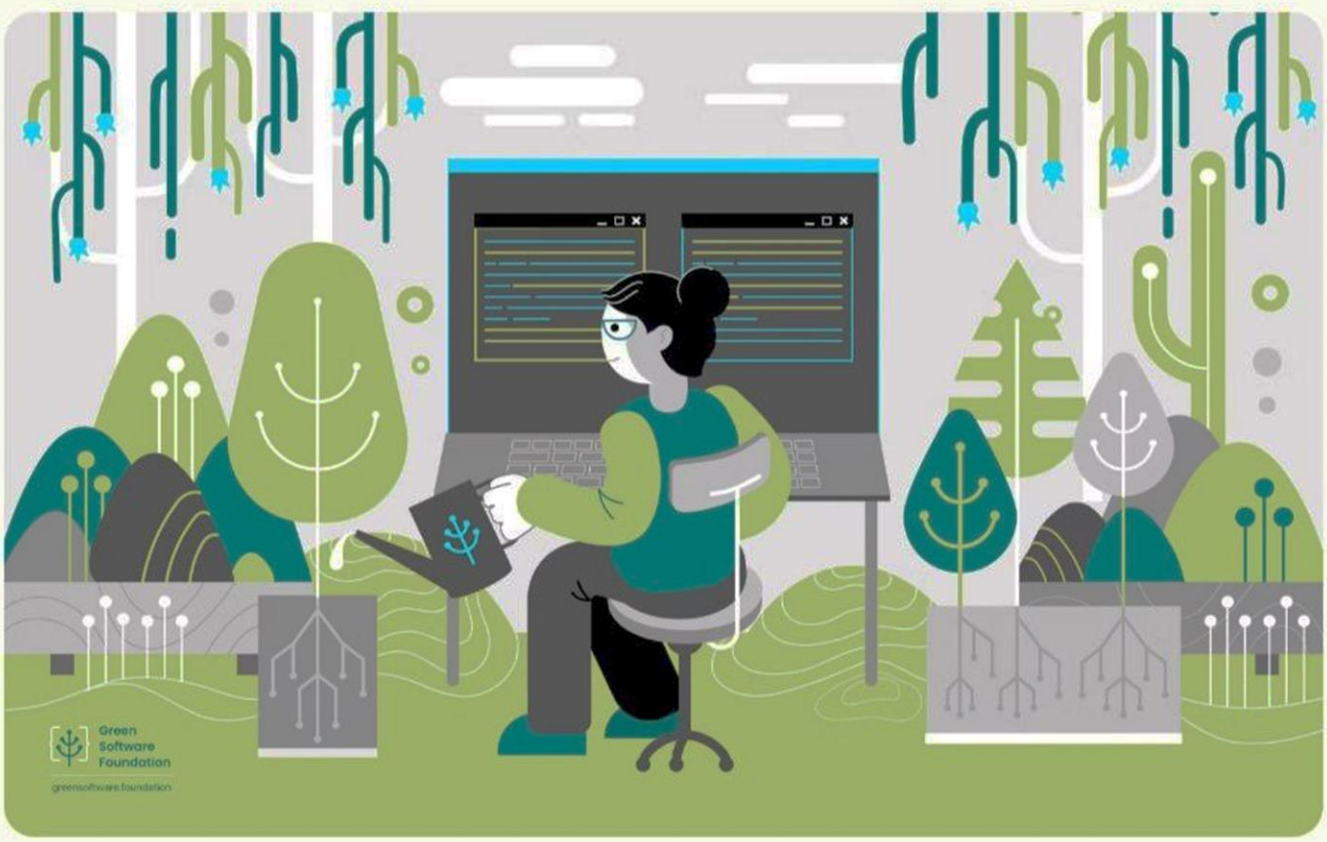
10 RECOMMENDATIONS FOR GREEN SOFTWARE DEVELOPMENT

Read this article in

- English

Posted on November 18th, 2021

When it comes to green software development, every choice you make matters. Read these 10 recommendations for greener software. How many of them are you not following?



Climate crisis is upon us, and it is worsening. Urgent and sustained actions are needed to address this defining story of our times which affects everyone of us and our future generations. Nevertheless, the actions we take now to reduce emissions of carbon dioxide (CO2) and other greenhouse gases would limit climate change and positively impact the future climate, as the recent the UN Intergovernmental Panel on Climate Change report, *Climate Change 2021: the Physical Science Basis*, emphasises.

Information technology (IT) sector—including hardware, software, firmware and communications—holds huge potential to help reduce overall global emissions . In fact, a report by the Global e-Sustainability Initiative estimates that IT solutions, which we call 'greening *by* IT,' can help cut nearly 10 times more CO2 than they emit. Nevertheless, it is imperative to reduce IT 's own carbon emission and footprint, which is known as 'greening *of* IT'.

As we now broadly recognise, green means efficient and environmentally sustainable. In my recent Cutter Consortium report, *Greening IT: Need and Opportunities*, which you can access for free, I broadly discussed several aspects of Green IT.

❑ Phrases & Vocabulary

when it comes to...
matter
climate crisis
be upon someone
urgent and sustained actions
future generations
to take actions
reduce emissions
greenhouse gases
limit climate change
positively impact
intergovernmental
sth holds huge potential to do sth
overall global emission
it's imperative to do
environmentally sustainable

broadly: in general, generally, mainly
nevertheless: nonetheless, in spite of that, however
emphasize: focus attention on, highlight
recognize: identify, know again, accept
climate: average weather conditions
worsening: becoming worse
urgent: emergency, important, vital
reduce: lessen, make less, lower
impact: affect, influence
imperative: extremely important/urgent
our times: present period of time

when it comes to...
when considering some particular person, thing, or action
operate a machine/process/system
Synonyms:
work, use, handle

crisis
a situation that is extremely difficult or dangerous, when there are many problems
a major/serious/global crisis
an economic/financial/political crisis
a looming/impending/growing crisis
cause/create a crisis
face a crisis
a crisis arises/occurs/deepens
address/resolve/solve a crisis
In crisis

be upon someone
to be something that someone will experience or have to deal with soon

emissions
the production and discharge of something, especially gas or radiation

greenhouse gas
one of several gases, especially carbon dioxide, that prevent heat from the earth escaping into space, causing the greenhouse effect

intergovernmental
between two or more governments
intergovernmental conference/negotiations

matter (verb)
to be important, or to affect what happens
Synonym:
count

matter (noun)
- a situation or subject that is being dealt with or considered
- the matter: the reason for pain, worry, or a problem
- physical substance in the universe
- things of a particular kind

to be a matter of something
something is essentially dependent on or simply involves that specific thing

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sustainable
causing, or made in a way that causes, little or no damage to the environment and therefore able to continue for a long time
sustainable energy
sustainable development
sustainable products/services/design

sustainability
the quality of causing little or no damage to the environment and therefore able to continue for a long time

sustained
continuing at a particular level for a period of time
sustained economic growth/downturn/recovery
sustained commitment/effort/success

generation (age group)
all the people of about the same age within a society or within a particular family
the younger/older generation
future generation
for generations

generation (creation)
- the production of energy in a particular form

Electricity/power generation

- the production of energy in a particular form

generation of excitement
revenue generation

- a group of products or machines that are all at the same stage of development

next/new generation
third-generation computers

❑ Exercise 1

Fill in the blanks with the words below. Some word forms may need to be changed.

face eruption crisis accumulate matter resolve promote emission sustain renewable

1. I had to take a day off to deal with a family _____, our pet died and our children were inconsolable.
2. The burning of fossil fuels contributes to greenhouse gas _____, acid rain, air and water pollution.
3. this kind of workload is not _____ long-term.
4. Natural sources of _____ of sulfur dioxide include volcanic _____ and forest fires.
5. The industry is _____ a serious staffing crisis.
6. The crisis was _____ in a matter of a few hours.
7. By utilizing _____ energy sources, we can _____ a more sustainable environment
8. Success on the stock market is basically a _____ of confidence.

Answer Key

Green IT, an umbrella term

Green IT is an umbrella term referring to environmentally sound IT hardware, software, systems, applications, and practices. It encompasses three complementary approaches to improving environmental sustainability.

- **Greening of IT.** This inward-looking approach focuses on reengineering IT products and processes to improve their energy efficiency, maximize their use, minimize their carbon footprint and meet compliance requirements. The greening of IT through making green software is the mandate of the Green Software Foundation.
- **Greening by IT** means using IT as an enabler to create a sustainable environment. This outward looking approach focuses on offering innovative solutions to key sectors such as manufacturing, energy, business, agriculture, healthcare, and buildings—homes, offices and other buildings—to decrease their emissions and resource consumption, while allowing for growth.
- **Promoting Green Awareness.** Many people are not yet aware of the serious impacts of the climate crisis and are not taking action to address it. IT has the ability and the duty to motivate them, help them be better informed and get them more engaged in the fight against climate change. Thereby IT can help promote 'green' initiatives and desired behavioral changes.

Over the years, much emphasis and progress has been made towards making IT hardware efficient and environmentally friendly. But, to realize the fuller benefits, we need to take our green initiatives down to the software. Hence the newfound interest in making software greener.

In this article, we emphasize the need for greening software and examine how we can make our software greener to reduce carbon emission resulting from software development and use.

❑ Phrases & Vocabulary

an umbrella term
complementary approaches
compliance requirements
inward-looking
outward-looking
carbon footprint
foundation
innovative solutions
resource consumption
get sb more engaged
take sth down to sth
motivate
initiatives

environmentally sound: environmentally friendly
encompass [formal]: include, involve
to deallocate memory: to free memory
mandate: official responsibility
thereby: by that means, in this way
hence: for that reason, therefore, consequently
motivate: encourage, inspire, spur on
engaged: involved in something, busy
initiatives: actions, new plans

an umbrella term
a word or phrase that groups a variety of related ideas or concepts. It's similar to an umbrella that shelters many different things.

inward looking [disapproving]
not willing to consider ideas that are different from your own, or to work together with people from different groups or places

Synonym:
insular

Antonym:
outward looking [approving]

compliance requirements
compliance requirements are the guidelines that businesses must follow to adhere to laws, regulations, and ethical practice

foundation
- an organization that has been created in order to provide money for a particular group of people in need of help or for a particular type of study
- the act of establishing an organization, state, etc.
- the base that is built below the surface of the ground to support a building
- an idea or fact that something is based on

innovative
using new ideas or methods
innovative ideas/products/programs
an innovative approach/practice/strategy

consumption

- the act of using, eating, or drinking something, or the amount that is used, etc.

fuel/energy, etc. consumption
increase/reduce the consumption of sth

- the process of buying and using goods, or the amount that is bought and used

domestic/home consumption
personal consumption

take sth down to sth

to reduce or lower something to a specific level or point; essentially, to decrease something until it reaches a particular value or state

• What is a Carbon Footprint?

A carbon footprint is the total greenhouse gas (GHG) emissions caused directly and indirectly by an individual, organization, event, or product. It is calculated by summing the emissions resulting from every stage of a product or service's lifetime (material production, manufacturing, use, and end-of-life). Throughout a product's lifetime, or lifecycle, GHGs such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), may be emitted. Differences in heat trapping are accounted for by the global warming potential (GWP) of each gas, resulting in a carbon footprint in units of mass of carbon dioxide equivalents (CO_2e) (See the Greenhouse Gases Factsheet).

❑ Confusing Words

complementary, complimentary

Like the nouns and verbs they come from, "complement" and "compliment," the derived adjectives "complementary" and "complimentary" can be confusing.
These word pairs are **homophones**; in other words, they sound alike but have different meanings. One describes a perfect partnership and the other expresses appreciation or praise.

complementary:
different but useful or attractive when used together
complementary roles/skills/strengths

complimentary:
- praising or expressing admiration for someone
- if tickets, products, services, etc. are complimentary, they are given free

Examples:
- My family and my job both play an important part in my life, fulfilling separate but complementary needs.
- Everybody was complimentary about the hotel service.
- Parking is usually complimentary or included in the ticket price.

❑ Exercise 2

Fill in the blanks with the words below. Some word forms may need to be changed.

compliance consume innovative footprint (outward looking) (inward looking) export

1. The company needs to change its _____ corporate culture.
2. We need to cut down on our fuel _____ by having fewer cars on the road.
3. The finance team is responsible for ensuring the company remains in _____ with all financial reporting requirements.
4. Big companies are always looking for _____ products that can't be easily copied.
5. He was remarkably _____, and always showed interest in other people's activities.
6. Most of our products are made for domestic consumption rather than _____.
7. The quickest and easiest way to reduce our carbon _____ is through energy efficiency.

Answer Key

Greening of Software

Software is pervasive and has significantly transformed almost every aspect of our life and work. Many applications require large, complex software. The significance and use of software will only grow in future. What impact, if any, can it cause on our environment?

What many don't realize is that, like computer hardware, software can contribute to environmental problems. Although software doesn't consume energy by itself directly, it directs and influences operation of computer hardware, thereby impacting hardware's energy consumption indirectly and hence carbon emission. Computationally inefficient software can have a major impact on energy consumption. So, like computer hardware, software is part of the problem for environmental sustainability.

As hardware becomes more powerful and energy efficient, the impact of software on overall energy consumption becomes significant. Several real-world examples reinforce this trend. University of Cambridge estimates that the energy needed to maintain the Bitcoin network is roughly 115 terawatt-hours (TWh) which is about twice the energy consumption of the entire nation of Switzerland. A recent research revealed huge environmental costs of training a variety of recently successful neural network models for Natural Language Processing (NLP).

Further, the very development of software can be energy intensive. For example, researchers trained an AI model to classify flowers using a small, publicly available dataset of iris flowers. The AI model achieved accuracy of 96.17 percent in classifying the flowers' different species with only 964 joules of energy. But to achieve higher accuracy the system consumed significantly higher energy—to gain 1.74 percent increase in accuracy energy consumption raised about three times significantly to 2,815 joules and further increase in accuracy demanded orders of increase energy consumption. The wasteful approach of throwing more computing power at a problem to get better results than necessary has been dubbed *red AI*.

Therefore, it's important to design and use software to optimize its energy consumption. As the use of software has exploded in all areas of our activity this is becoming a necessity. Though software impact has been an overlooked factor in the sustainability discourse until recently, it's time to pay due attention to greening software. This is the mandate of the Green Software Foundation. Enterprises and the IT industry should incorporate green software as part of their sustainability efforts.

❑ Phrases & Vocabulary

software is pervasive
transform
reinforce
a new research revealed
further
the very development of software
energy intensive
dubbed *red AI*
exploded use of software
a necessity
overlooked factor
discourse
due attention
enterprise

reveal: disclose, show, make known
establish: create and operate, set, start
combination: mixture
in case of: in the event of
usage: utilization, use, employment
very [before noun]: exact or particular (to add emphasis)
overlooked: failed to notice
discourse: spoken or written discussion

pervasive [formal]
present or noticeable in every part of a thing or place
Synonyms:
prevalent, common

transform
to change completely the character or appearance of something in order to improve it
transform sth/yourself into sth
be transformed into/by/from sth
transform a company/business/organization
transform a country/market(place)/product

reinforce
to make something stronger
Synonyms:
strengthen, fortify

energy intensive
using a lot of energy
Energy intensive industries
Synonyms:
power hungry/consuming
energy demanding

dub
give an unofficial name or nickname to (someone or something).
Synonyms:
call, name, label, give a name

explode
increase suddenly or rapidly in size, number, or extent
Synonyms:
increase suddenly/rapidly/dramatically
Antonym:
implode (to fail suddenly and completely)
an economy/industry/market implodes

due care and attention [British]
the amount of care and attention that a person is expected, usually by law, to show when doing something, especially when driving
Synonyms:
due consideration/regard, adequate attention, appropriate attention

enterprise [noun]
an organization, a company, or a business
Private/public enterprise
a manufacturing/catering/farming enterprise
a large/small/medium-sized enterprise
a domestic/local/foreign enterprise
a family enterprise
enterprise development/management

❑ Confusing Words

farther, further

The terms have very similar meanings, and English speakers have been using them as synonyms for centuries but there is some differences between them.

farther [comparative of “far”]:
to a greater distance (physical distance)

further [comparative of “far”]:
to a greater distance (symbolic distance) or degree, or at a more advanced level

Examples:

- He went farther down the road.
- I wanted to discuss it further, but we didn’t have time.
- further a project (but you can’t “farther” a project, because farther doesn’t have a verb sense).
- And further (moreover, additionally), you hurt my feelings (but not farther)

❑ Exercise 3

Fill in the blanks with the words below. Some word forms may need to be changed.

transform(x2) physical pervasive reinforce minimize (energy intensive) enterprise alternative infrastructure

1. Virtualization technology has _____ the way companies deploy and utilize their IT resources.
2. With the _____ shift toward green IT, companies are now focusing on eco-friendly hardware and energy-efficient systems to _____ their environmental impact.
3. Cloud computing can _____ green IT strategies by centralizing resources and reducing the need for individual _____ servers.
4. With the explosive growth of data across _____, green IT practices are becoming essential to manage the energy-demanding requirements of modern IT _____.
5. The compiler _____ high-level code into machine-readable instructions.
6. Cryptocurrency mining has become increasingly _____, raising concerns about its environmental impact and pushing the industry to adopt greener _____.

Answer Key

How to Green Your Software

To realize a greener software, we need to consider energy efficiency and sustainability of software as an important parameter, in addition to functionality, security, scalability, and accessibility. We also need to design software for reuse, extended longevity of use and minimal computational and memory resource requirements.

Writing energy-efficient software is, however, a challenging task; it requires a change of mindset for software developers and designers as well as guidelines, best practices, models and tools to measure and reduce the effect of software on the energy consumption of the underlying hardware. A 2015 IEEE *IT Professional* article presents a conceptual framework that provides a unifying view of the strategies, models, and tools available so far for designing and developing greener software.

Development of green software spans the entire lifecycle of software: development, operation and disposal (reuse).

Here are some recommendations for creating greener software. They focus on four areas: design and coding options, choice of language, selection of AI models, and software development.

❑ Phrases & Vocabulary

scalability
longevity
a challenging task
a change of mindset
underlying hardware
conceptual framework
unifying view
span

so far: until now

scalability
the ability of a business or system to grow larger

longevity [formal]
the ability to last for a long time

mindset
a person's way of thinking and their opinions
a different/the same mindset
Synonyms:
mentality, outlook

underlying
real but not immediately obvious

unify
to bring together; combine
Synonyms:
unite, bring together, combine

span
to exist or continue for a particular length of time

conceptual
based on ideas or principles
conceptual art/artist
conceptual framework

❑ Exercise 4

Fill in the blanks with the words below. Some word forms may need to be changed.

scale expand mindset underlying unify span concept(x2) longevity

1. This greatly extends the cycle life of each battery between charges, and generally extends battery _____.
2. She struggled to _____ the new theories because they were too abstract and lacked clear real-world connections.
3. Cloud solutions offer scalability, reducing the environmental cost of _____ IT infrastructure.
4. Developers with an ethical _____ prioritize privacy and fairness in AI systems.
5. Green IT practices _____ global efforts toward a sustainable tech future.
6. Sustainable development _____ all industries, from agriculture to technology.
7. The _____ framework of AI ethics includes fairness, accountability, and transparency
8. We are looking for _____ in terms of sizing, cost, and performance.
9. To stop a problem you have to understand its _____ causes.

Answer Key

Design and coding options

Developers should think about and act on how to minimize environmental impacts of software from the early stage of software development. Adopting the following general principles will help you in realizing green software.

(01) Focus on and control features with higher power consumption and common usage scenarios.

(02) Reduce data usage. Adopt efficient cache policy, minimise data exchange, and manage the lifecycle of stored data - compress and aggregate data and use smaller sizes for media and image when possible.

(03) Remove or refactor unused features. This improves energy efficiency and makes software easier to maintain.

(04) Detect and remove loops which can't achieve their intended purpose and uselessly consume energy. For example, polling an unreachable server.

(05) Adapt your app's behavior according to the device power mode or other operating conditions.

(06) Limit computational accuracy of the application to the desired level which commensurate with the operational needs. For example, you do not need very high resolution geolocation data of your user, if you are just looking for friends nearby.

(07) Monitor real-time energy consumption of the application, to identify the modules that can be optimized to produce fewer emissions.

For additional related information, refer to Principles of Green Software Engineering which identifies eight key potential areas to focus on and GreenCoding which offers guidelines on the logic, methodology and platform to write, develop and run the code.

Choice of language

(08) Even the choice of programming language you use can influence the energy efficiency of the software. In a 2018 study, a team of researchers from three universities in Portugal examined energy efficiency across programming languages. They wrote and evaluated software written in 27 different languages for 10 different problems. They monitored electricity consumption as well as the speed and memory usage of each. As highlighted in a brief article, they concluded that there are several factors to be considered and no single language is the best under different criteria. We recommend further studies along these lines.

Choice of AI Model

(09) As outlined in a recent *IEEE Spectrum* article, AI can be made greener by developing and using a less-power-consuming ML model; creating and sharing reproducible code that will reduce duplicated efforts; and developing and using specialized hardware optimized for AI workload. For further details, refer to the ACM article, *Green AI*. You may also want to check out this article: *Why should sustainability be a first class consideration for AI systems?*

Software Development

(10) During development monitor real-time power consumption through techniques such as dynamic code analysis. The data you gather will be critical for understanding the gaps between the design choices and actual energy profiles. Tools and resources are now available for developers for managing energy consumption. For example, Intel's Software Development Assistant allows developer to take energy measurements from the system as it executes specific workloads within their application and determine its efficiency.

❑ Phrases & Vocabulary

adopting the following principles
adapt sth according to sth else
compress and aggregate
intended purpose
polling an unreachable server
commensurate
write and evaluate software
under different criteria
reproducible code
reduce duplicated efforts

actual: real, true
reproducible: able to be reproduced
aggregate: to combine into a single group
compress: to press sth into a smaller space
intended: planned, meant

polling a server
a client application repeatedly sends requests to a server at regular intervals to check for any new data or updates

commensurate
in a correct and suitable amount compared to something else
commensurate with

evaluate
to judge or calculate the quality, importance, amount, or value of something
Synonyms:
assess, judge

criterion [plural: criteria]
a standard by which you judge, decide about, or deal with something

- ## Polling vs. Streaming

We have heard of polling in our daily life where it means recording the opinion or vote. The second meaning of the term is to check the status of maybe a device — especially as a part of a repeated cycle.

Polling and streaming are two distinct methods for data transmission between clients and servers, especially in the context of web applications and APIs. Understanding their differences is crucial for designing efficient and responsive systems.

Polling is a technique where the client periodically sends requests to the server to check for new data.
The server processes each request and sends a response, whether or not new data is available.

Streaming involves establishing a continuous, open connection between the client and the server, allowing data to be sent as soon as it's available.
It's more like a continuous flow of data, as opposed to the discrete requests in polling.

❑ Confusing Words

adopt, adapt

adopt:

- to accept or start to use something

adopt an approach/strategy/policy
adopt a measure/system/plan
adopt a resolution/regulation/solution

- to take another person's child legally into your own family to raise as your own child

adapt:

to change, or to change something, to suit different conditions or uses
adapt something for something
adapt from
adapt to

- I think it's time to adopt a different strategy in my dealings with him.
- The new law means companies will adopt energy-saving measures.
- They have no children of their own, but they're hoping to adopt.
- The good thing about children is that they adapt very easily to new environments.
- The play had been adapted for (= changed to make it suitable for) children.

❑ Exercise 5

Fill in the blanks with the words below. Some word forms may need to be changed.

poll commensurate(x2) contribute evaluate(x2) criteria adapt employ

1. It's impossible to _____ these results without knowing more about the research methods _____.
2. Optimizing how often devices _____ a server can significantly reduce the load on data centers, _____ to more energy-efficient operations.
3. such heavy responsibility must receive _____ reward.
4. Developers adhere to green coding _____ to minimize software-related energy consumption.
5. Organizations should _____ the long-term benefits of adopting renewable energy sources for their operations.
6. Companies should ensure that their environmental efforts are _____ with their operational scale and energy usage.
7. They were able to _____ to whatever the political situations or life conditions demanded.

Answer Key

Prospects

Greening software is—and will continue to be—a necessity, not an option. To help create a more sustainable environment, software professionals must understand the principles of green software and its potential, and embrace green IT practices. By successfully greening your software systems, you can harness new opportunities, enhance your business's competitive advantage, and help create a sustainable environment that benefits current and future generations.

We need to educate software developers and students about green software and its prospects. To advance and promote green software, further research and development is required in several areas including environmental impact assessment, standards and regulation, and harnessing software for environmental sustainability. For instance, the Software Carbon Intensity specification from the Green Software Foundation is a positive step in this direction.

Software developers, engineers, professionals, educators, researchers, and users and the software industry can together make a huge difference and help create a sustainable environment that benefits current and future generations.

Let's join the green software bandwagon and pledge to develop and use green software.

❑ Phrases & Vocabulary

a necessity, not an option
harness new opportunities
competitive advantage
carbon intensity specification
make a huge difference
green software bandwagon
pledge to do sth

prospect: outlook, anticipation
embrace: accept/support willingly, welcome, take up

harness
to collect and control something so that it can be used effectively
harness energy/ideas/skills
harness the power of sth

carbon intensity
carbon intensity is a measure of carbon dioxide and other greenhouse gases (co 2 e) per unit of activity, like generating a product.

specification [short form: spec]
a detailed description of how something should be done, made, etc.
meet/conform to specifications
specifications for sth
product/performance/design specifications

bandwagon
an activity, group, etc., that has become successful or fashionable and so attracts many new people
a bandwagon effect

pledge
to make a formal promise to do something
pledge to do sth
pledge that sth
a campaign/election/manifesto pledge
make/honor/sign a pledge
Synonyms:
promise, guarantee

❑ Exercise 6

Fill in the blanks with the words below. Some word forms may need to be changed.

intensity bandwagon rigid pledge support harness(x2) specification

1. We are asking people to pledge their _____ for our campaign.
2. We have set _____ specifications for customer service.
3. Researchers are working to _____ the power of the ocean currents to collect renewable energy.
4. there was no clear _____ of objectives.
5. The success of the product led many companies to try to jump on the _____.
6. Countries with a high reliance on fossil fuels tend to have a higher carbon _____ in their energy sector.
7. All the candidates have given/made _____ not to raise taxes if they are elected.
8. Companies are _____ solar power to reduce the carbon footprint of their data centers.

Answer Key

1 back to exercise

1. crisis
2. accumulation
3. sustainable
4. emissions-eruptions
5. facing
6. resolved
7. renewable-promote
8. matter

2 back to exercise

1. inward looking
2. consumption
3. compliance
4. innovative
5. outward looking
6. export
7. footprint

3 back to exercise

1. transformed
2. pervasive-minimize
3. reinforce-physical
4. enterprises-infrastructure
5. transforms
6. (energy-intensive)-alternatives

4 back to exercise

1. longevity
2. conceptualize
3. expanding
4. mindset
5. unify
6. spans
7. conceptual
8. scalability
9. underlying

5 back to exercise

1. evaluate-employed
2. poll-contributing
3. commensurate
4. criteria
5. evaluate
6. commensurate
7. adapt

6 back to exercise

1. support
2. rigid
3. harness
4. specification
5. bandwagon
6. intensity
7. pledges
8. harnessing

Sources

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CS50x Iran

Harvard's Computer Science 50x Iran