

DémoJ cheat-sheets



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Purpose

DémoJ is designed for teaching and scientific popularization on information technology and its environmental impact.

Because it is autonomous both electrically and informationally DémoJ can be used in many venues:

- Third places such as bars, parks, technology fairs, ...
- Schools and universities
- Business meetings
- ...

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System explanation



3 boxes for 3 tiers: Terminal, Network, Server

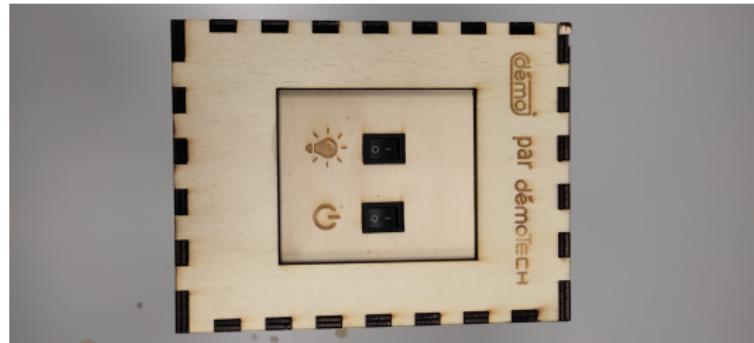
Two light display per box: one for temperature, one for power consumption

Green is low, yellow is average, orange is high, red is very high

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Technical characteristics

- A 2.4 A battery
- A Raspberry PI board
- A wattmeter and a thermometer
- Two LED displays



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Deployment steps

If one of the boxes doesn't start, make sure that the battery is loaded,
if not plug it to a USB charger

Turn on the switches of the boxes

Connect to the WiFi network DemoJ using your phone

Open a navigator and start the user application by going to demoj.fr

Press the administration button on the screen,
and then log as administrator using password 0000

From there, you can start whatever scenario you want,
and see the boxes interacting between each others

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Interactive scenarios

The public you are presenting the project to can also interact with the system by opening the same application and using the public interface.

From there, the public can start whatever scenario they want, and see the boxes interacting between each others

Choose a scenario

- Bignum calculation including high intensity functions (factorial, fibonacci, primality test)
- Video streaming
- Chatbot with generative AI

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Scenarios

Scénarios

Calculatrice

Effectuez des calculs simples ou exécutez des fonctions complexes, côté client ou serveur.

Voir le scénario

Intelligence Artificielle

Générez du texte avec une IA conversationnelle similaire à ChatGPT.

Voir le scénario

Streaming Vidéo

Regardez des vidéos en streaming avec des fonctionnalités de contrôle similaires à Youtube.

Voir le scénario

Soliloquies Terminal Bureau Serveur

Calculatrice

Client Serveur

AC +/- % ()
Fact Fib Prim +
7 8 9 x
4 5 6 -
1 2 3 +
0 . =

Streaming

Choisir une option...
Vidéo basse qualité
Vidéo haute qualité
Vidéo très haute qualité

Choisir une option...

Charger la vidéo

IA

Moi Give me a very short recipe for raspberry tart

Assistant Here's a simple recipe for a delicious raspberry tart: *Ingredients*: * 1 sheet of frozen puff pastry, thawed * 2 cups fresh raspberries * 2 tbsp granulated sugar * 1 tsp vanilla extract *Instructions*: 1. Preheat oven to 400°F (200°C). 2. Roll out the puff pastry and place in a tart pan. 3. Arrange raspberries on top, leaving a 1-inch border. 4. Sprinkle sugar and drizzle with vanilla extract. 5. Fold edges of pastry up over the fruit. 6. Bake for 35-40 minutes or until golden brown. Enjoy your sweet and tangy raspberry tart!

Moi Thanks ! How many calories are there in this tart?

Assistant To estimate the calorie count, let's break down the ingredients: * 1 sheet of frozen puff pastry (approximately 10-12 inches): around 250-300 calories * 2 cups fresh raspberries: approximately 60-80 calories * 2 tbsp granulated sugar: around 100-120 calories * 1

Message...

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Scenario 1: Calculator

For stressing either the Terminal side or the Server side

- The 4 basic operations
- Factorial
- Primality test
- Fibonacci

It is common in web applications to have the choice of which side to stress

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Scenario 2: Simple Streaming Service

For showing the impacts of online video services on all tiers

- Multiple video qualities
- Multiple video formats

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Scenario 3: An AI driven chatbot

For showing how AI applications stress computer systems

- Use a 1.6 Go LLM running in the server box
- Watch the impact on other tiers

With a special mention for memory stress on the Server tier

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Energy explanation

Energy is a quantification of the change of a system's state
- Jean-Marc Jancovici (Shift Project)

$$P = \frac{E}{t} \Leftrightarrow E = P.t$$

where P is Power in watts, E is Energy in joules, and t is time in seconds

$$P = U.I$$

where U is electrical tension in volts, and I is electrical intensity in amps

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Energy explanation

1st law of thermodynamics: in an isolated system, energy is conserved

In a computer system such as DémoJ,
all the consumed electrical energy is transformed into thermic energy,

which can damage the electrical system,

so a dissipative system is needed

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Power equivalence examples

Each box uses a maximum of 15 W (LEDs display and Raspberry Pi).

For comparison, here are some typical values:

Basic objects	Power (watts)
Phone	5
Laptop	45
Gaming Computer	600
Vacuum cleaner	1 200
Car	75 000
Low-energy light bulb	15
A single box	15

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Steps to follow at the end of a demo

Stop the user applications

Turn off switches

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Warnings

This product contains electronic components, and must therefore avoid any source of water including rain. Make sure the weather allows it before using it outside.

Boxes are made of wood, so they have to be placed at a correct distance from any source of heat.

Batteries should be loaded with their original battery chargers in order to avoid premature wear.

The software part of the system isn't intended for environments that have special cyber-security requirements.