Jorge A. - Vicente C. - Tristan H.

🤔 WASM 😳

¿El futuro de la web?

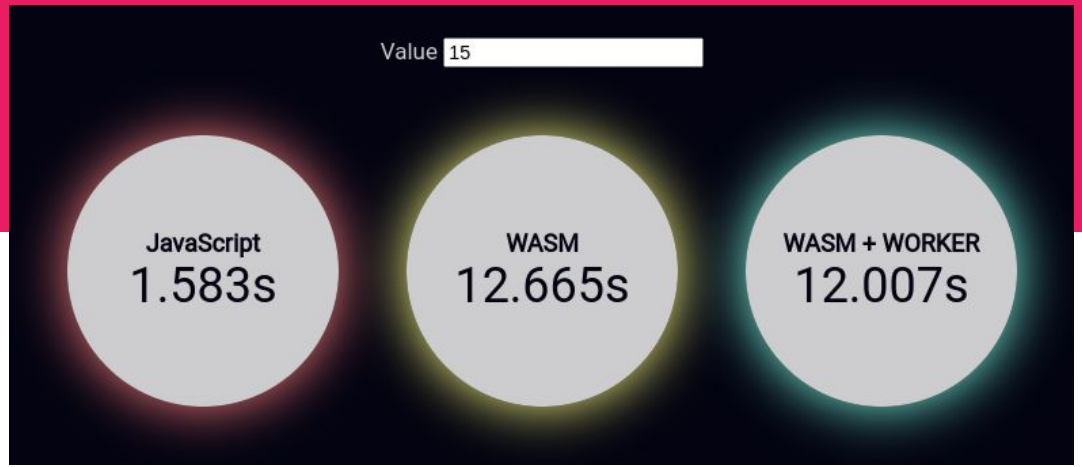
Algoritmo: Partición de un conjunto de números

- Conjuntos de sumas iguales
- Basado en backtracking
- Algoritmo exponencial

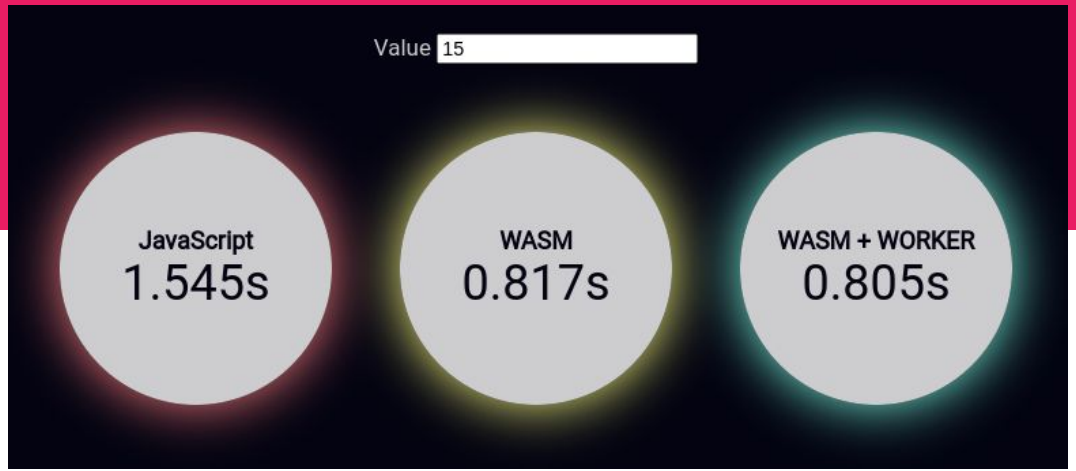
Compilación

Impacto de los parámetros en los benchmarks

Sin optimización (-O0)



Con optimización (-O3)



Función principal

```
extern "C" bool partition(u32 *numbers, u32 size, u32 num_partitions) {
  if (num_partitions < 1) return false;
  if (size < num_partitions) return false;

  vector<u32> asignment(size, 0);
  return partition_rec(numbers, size, num_partitions, asignment, 0);
}
```

Función recursiva

```
bool partition_rec(const u32 *numbers, u32 size, u32 num_partitions,
                   vector<u32> &asignment, u32 position) {
  if (position == size) {
    return check_sums(numbers, size, num_partitions, asignment);
  }
  for (u32 choice = 0; choice < num_partitions; choice++) {
    asignment[position] = choice;
    if (partition_rec(numbers, size, num_partitions, asignment, position+1))
      return true;
  }
  return false;
}
```

Verificar suma

```
bool check_sums(const u32 *numbers, u32 size, u32 num_partitions,
                vector<u32> &asignment) {
  vector<u32> sums(num_partitions, 0);
  for (u32 i = 0; i < size; i++) {
    sums[asignment[i]] += numbers[i];
  }
  u32 sum = sums[0];
  for (u32 i = 1; i < num_partitions; i++) {
    if (sum != sums[i]) return false;
  }
  return true;
}
```

Exportar funciones

```
emcc -sEXPORTED_FUNCTIONS=_partition,_malloc,_free \
     -sEXPORTED_RUNTIME_METHODS=ccall \
     -O3 -o main.js main.cpp
```

Interacción con WASM

```
const randomArray = Uint32Array.from(...);
const ptr = Module._malloc(randomArray.byteLength);
Module.HEAPU32.set(randomArray, ptr>>2);

const result = Module.ccall("partition", "boolean",
  ["number", "number", "number"],
  [ptr, randomArray.length, 3]);

Module._free(ptr);
```

Web Workers

Scripts en el background

Web Workers - LS

Method of running scripts in the background, isolated from the web page

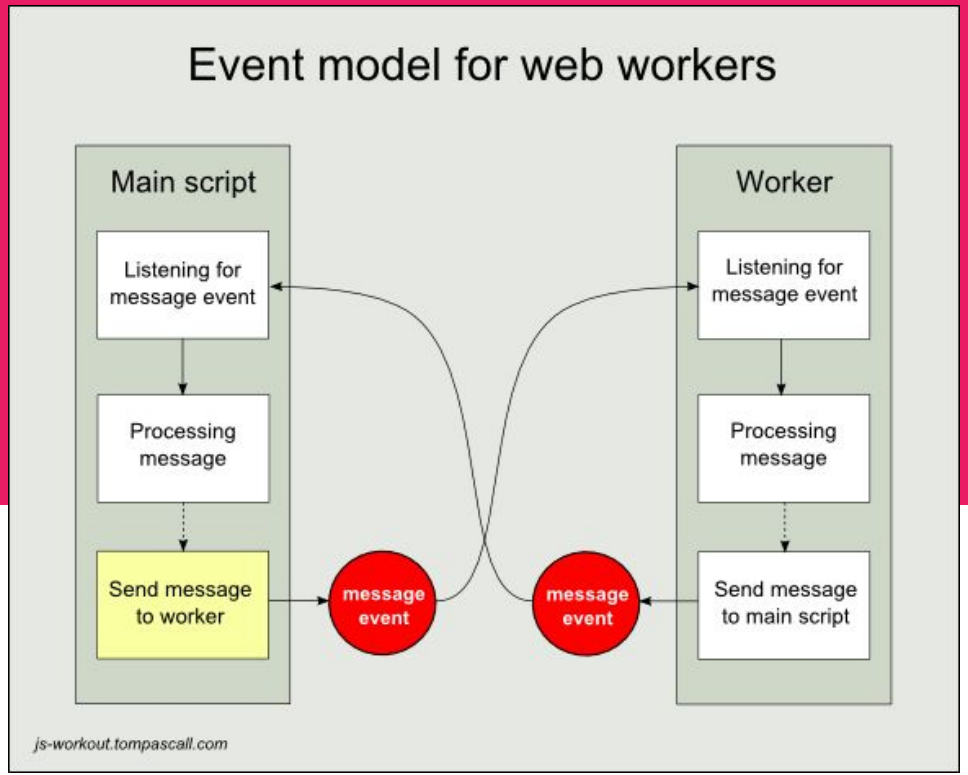
Usage % of all users ?

Global 95.35%

Current aligned | Usage relative | Date relative | Filtered | All

IE	Edge *	Firefox	Chrome	Safari	Opera	Safari on iOS *	Opera Mini *	Android Browser *	Opera Mobile *	Chrome for Android	Firefox for Android	UC Browser for Android	Samsung Internet	QQ Browser	Baidu Browser	KaiOS Browser
								2.1								
6-9		2-3		3.1-3.2	10.1	3.2-4.3		2.2-4.3								
10	12-99	3.5-98	4-99	4-15.3	11.5-82	5-15.3		4.4-4.4.4	12-12.1				4-15.0			
11	100	99	100	15.4	83	15.4	all	100	64	100	99	12.12	16.0	10.4	7.12	2.5
		100-101	101-103	TP												

Notes | Test on a real browser | Sub-features | Known issues (0) | Resources (5) | Feedback


Event model for web workers
Main script
Listening for message event
Processing message
Send message to worker
message event
message event
Worker
Listening for message event
Processing message
Send message to main script
js-workout.tompascall.com

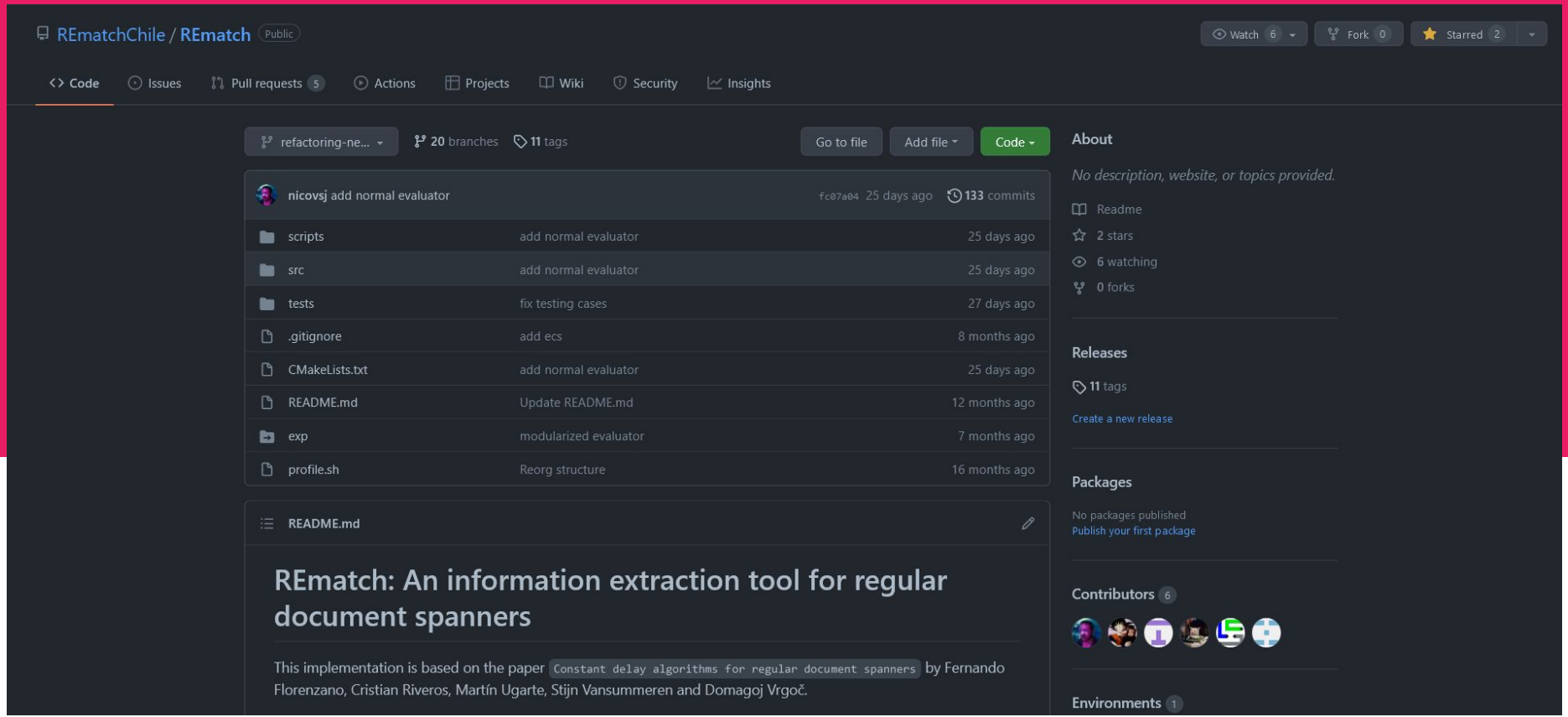
Web Workers makes it possible to run a script operation in a background thread separate from the main execution thread of a web application. The advantage of this is that laborious processing can be performed in a separate thread, allowing the main (usually the UI) thread to run without being blocked/slowed down.

Web Workers makes it possible to run a script operation in a background thread separate from the main execution thread of a web application. The advantage of this is that laborious processing can be performed in a separate thread, allowing the main (usually the UI) thread to run without being blocked/slowed down.

Web Workers makes it possible to run a script operation in a background thread separate from the main execution thread of a web application. The advantage of this is that laborious processing can be performed in a separate thread, allowing the main (usually the UI) thread to run without being blocked/slowed down.

REmatch

Un caso de uso de WASM en la vida real


REmatchChile / REmatch Public
Watch 6
Fork 0
Starred 2
Code
Issues
Pull requests 5
Actions
Projects
Wiki
Security
Insights
refactoring-ne...
20 branches
11 tags
Go to file
Add file
Code
nicovsj add normal evaluator
fc07a04 25 days ago
133 commits
scripts add normal evaluator 25 days ago
src add normal evaluator 25 days ago
tests fix testing cases 27 days ago
.gitignore add ecs 8 months ago
CMakeLists.txt add normal evaluator 25 days ago
README.md Update README.md 12 months ago
exp modularized evaluator 7 months ago
profile.sh Reorg structure 16 months ago
README.md
REmatch: An information extraction tool for regular document spanners
This implementation is based on the paper Constant delay algorithms for regular document spanners by Fernando Florenzano, Cristian Riveros, Martín Ugarte, Stijn Vansummeren and Domagoj Vrgoč.
About
No description, website, or topics provided.
Readme
2 stars
6 watching
0 forks
Releases
11 tags
Create a new release
Packages
No packages published
Publish your first package
Contributors 6
Environments 1

¿Qué es?

- Proyecto de investigación del DCC
- Liderado por los profesores Cristian Riveros y Domagoj Vrgoč
- Consiste en una librería de extracción de información por medio de expresiones regulares

El desafío

- Divulgar la librería dentro de la comunidad
- Evitar el uso de servidores
- Evitar la necesidad de que los usuarios tengan que compilar el código en sus dispositivos

Solución: Web + Emscripten

Masivo, consistente y mantenible en paralelo a su implementación en C++

Query

```
(^|\n)!x{[A-Z][a-z]{4,}} !y{([A-Z][a-z ]+)+}($|\n)
```

RUN

Text

```
1 Nicolas Van Sint Jan
2 Vicente Calisto
3 Marjorie Bascunan
4 Oscar Carcamo
5 Cristian Riveros
6 Domagoj Vrgoc
```

IMPORT FILE

Matches

id	x	y
0	Domagoj	Vrgoc
1	Cristian	Riveros
2	Oscar	Carcamo
3	Marjorie	Bascunan
4	Vicente	Calisto
5	Nicolas	Van_Sint_Jan

1

EXPORT MATCHES

Problemas que hemos encontrado con Emscripten (2018-presente)

- Poca documentación
- Límites de memoria
- Debugging
- Proyecto “grande”
- Interfaz JS (embind)
- Interfaz Worker

Para más información ingresar a rematch.cl

(La página sigue en construcción)

Gracias