CREATOR: a tool for teaching assembly programming with RISC-V

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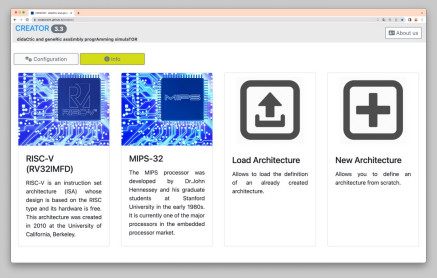
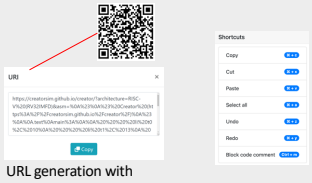
CREATOR

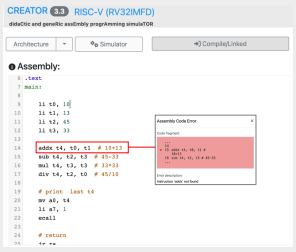


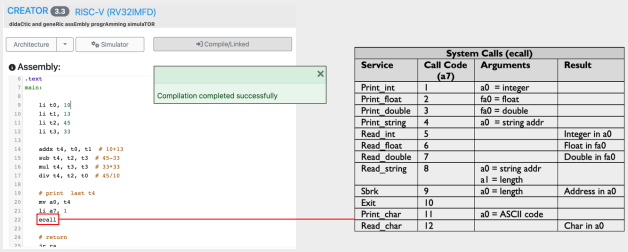
- Didactic simulator specially designed for students and teachers.
- Multiplatform:
  - It runs on a web browser without a server (desktops, tablets, and smartphones).
  - It also allows command line execution.
- Integrated environment for editing, compiling, executing, and debugging assembly programs.
- Support for creating teaching material, generates URLs with the programs created.
- Possibility to define and work with different architectures and assembly languages.
  - Currently: MIPS and RISC-V (**RV32IMFD**).
- Integration with ESP32-C3 microcontroller.

Edit and Compile



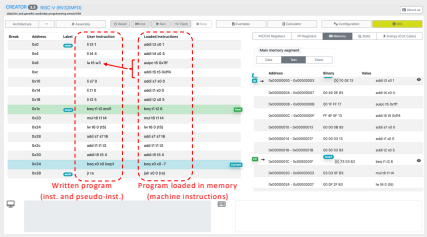
URL generation with examples for teaching materials



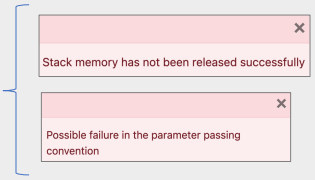


System Calls (ecall)			
Service	**Call Code (a7)**	**Arguments**	**Result**
Print_int	1	a0 = integer	
Print_float	2	fa0 = float	
Print_double	3	fa0 = double	
Print_string	4	a0 = string addr	
Read_int	5		Integer in a0
Read_float	6		Float in fa0
Read_double	7		Double in fa0
Read_string	8	a0 = string addr a1 = length	
Sbrk	9	a0 = length	Address in a0
Exit	10		
Print_char	11	a0 = ASCII code	
Read_char	12		Char in a0

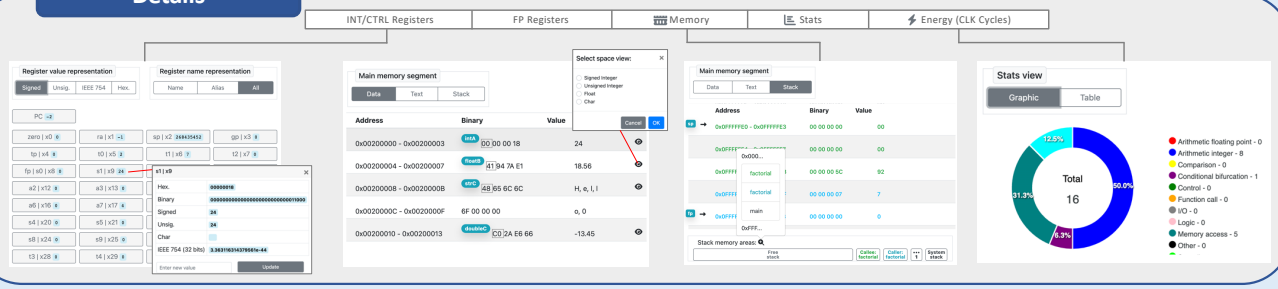
Run and Debug



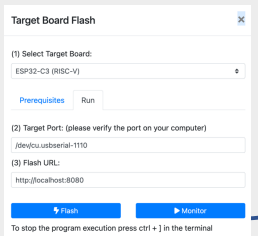
- Program loaded in memory with easy visualization of labels.
- Execution flow knowing the current and next instruction at all times (useful in loops, branching instructions, and function calls).
- Parameter passing convention and stack usage with alerts when it is not followed



Details

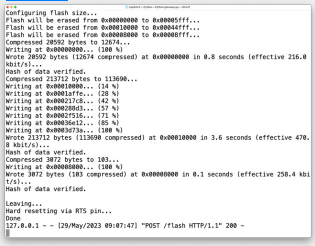


Integration with ESP32-C3 microcontroller

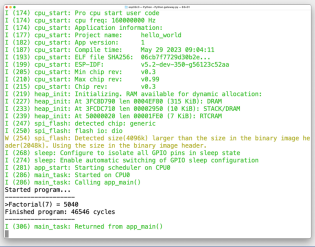


ESPRESSIF
ESP32-C3

Flash Flash to microcontroller



Monitor Execution on microcontroller



https://creatorsim.github.io/creator