The goal of this project is to implement a Clojure interpreter for a stack-based DSL. An example of the API is on the next page. We are looking for an example of the quality of work you would do at RPL.

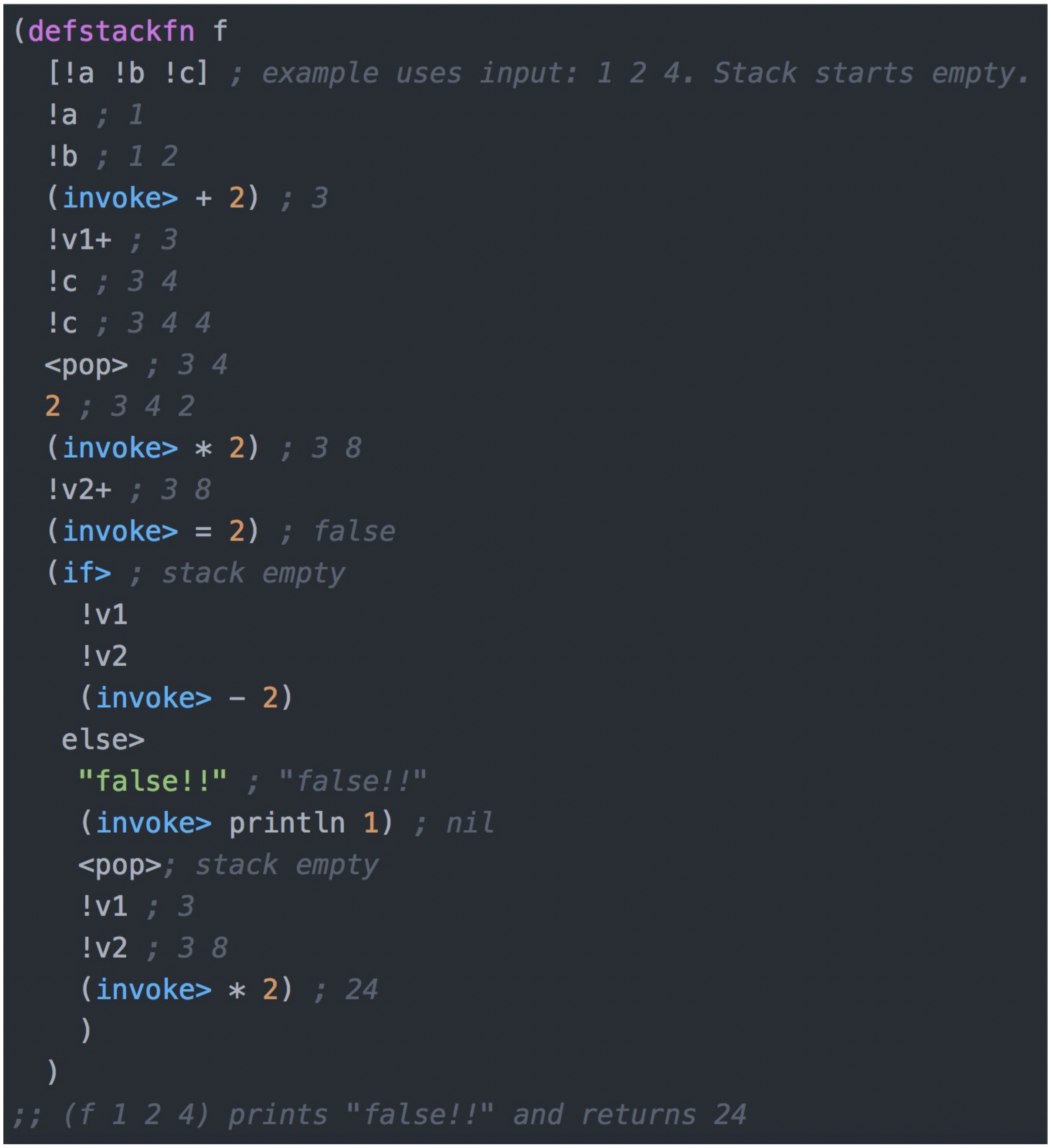
Explanation of functionality:

- Variables are symbols prefixed with "!", e.g. !v
- A stack function is defined with "defstackfn". The first argument is the input declaration which also provides variable names to the arguments. The stack always starts empty.
- The implementation of a stackfn is a sequence of stack operations.
- Using a constant as a stack operation pushes that value onto the stack
- Using a variable as a stack operation pushes the value for that variable onto the stack.
- A variable is assigned the top value of the stack by appending "+" to the variable name, e.g. !v+
- A function is invoked with "invoke>". "invoke>" takes as input the operation and the arity to use.
- <pop> is a special operation which removes the top value of the stack.
- if> tests if the top value of the stack is truthy to determine which branch to follow. The branches are separated with "else>"

Notes about your implementation:

- defstackfn should be a macro that produces a function invokable like any other function.
- Should provide an informative error if there's an invalid stack operation or a variable is referenced that doesn't exist.
- The example below contains all functionality you need to implement.
- It should be possible to shadow vars (naming a new local the name of an existing variable).

Code example with stack values in comments:



```
(defstackfn f
  [!a !b !c] ; example uses input: 1 2 4. Stack starts empty.
  !a ; 1
  !b ; 1 2
  (invoke> + 2) ; 3
  !v1+ ; 3
  !c ; 3 4
  !c ; 3 4 4
  <pop> ; 3 4
  2 ; 3 4 2
  (invoke> * 2) ; 3 8
  !v2+ ; 3 8
  (invoke> = 2) ; false
  (if> ; stack empty
    !v1
    !v2
    (invoke> - 2)
   else>
    "false!!" ; "false!!"
    (invoke> println 1) ; nil
    <pop>; stack empty
    !v1 ; 3
    !v2 ; 3 8
    (invoke> * 2) ; 24
    )
  )
;; (f 1 2 4) prints "false!!" and returns 24
```