

# Ruby trunk - Bug #15395

## Stack consistency error (2.6.0-rc1, JIT)

12/10/2018 07:19 AM - Tietew (Toru Iwase)

<b>Status:</b> Closed	
<b>Priority:</b> Normal	
<b>Assignee:</b> k0kubun (Takashi Kokubun)	
<b>Target version:</b>	
<b>ruby -v:</b> ruby 2.6.0dev (2018-12-10 trunk 66307) [x86_64-linux]	<b>Backport:</b> 2.4: UNKNOWN, 2.5: UNKNOWN

### Description

Rails 5.2.2 app JIT Stack consistency error

OS: Ubuntu 18.04.1 TLS  
GCC: 7.3.0-27ubuntu1~18.04  
Puma Started as: \$ ruby --jit-verbose=1 --jit-save-temps bin/rails server -pXXXX  
Ruby versions:  
ruby 2.6.0rc1 (2018-12-06 trunk 66253) [x86\_64-linux]  
ruby 2.6.0dev (2018-12-10 trunk 66307) [x86\_64-linux]

```
 JIT  
 2  
trunk  

```

### Error Message:

```
fatal (Stack consistency error (sp: 801, bp: 802)  
== disasm: #<ISeq:block in each@/home/***/vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/map.rb:21 (21,16)-(21,40)> (catch: FALSE)  
== catch table  
| catch type: redo    st: 0001 ed: 0011 sp: 0000 cont: 0001  
| catch type: next   st: 0001 ed: 0011 sp: 0000 cont: 0011  
|-----  
local table (size: 1, argc: 1 [opts: 0, rest: -1, post: 0, block: -1, kw: -1@-1, kwrest: -1])  
[ 1] k@0<Arg>  
0000 nop ( 21) [Bc]  
0001 getlocal_WC_0 k@0 [Li]  
0003 putself  
0004 getlocal_WC_0 k@0  
0006 opt_aref <callinfo!mid:[], argc:1, FCALL|ARGS_SIMPLE>, <callcache>  
0009 invokeblock <callinfo!argc:2, ARGS_SIMPLE>  
0011 leave [Br]  
):
```

### Ruby code:

<https://github.com/judofyr/temple/blob/v0.8.0/lib/temple/map.rb>

```
module Temple  
  class ImmutableMap  
    include Enumerable  
    # (snip)  
    def each  
      keys.each { |k| yield(k, self[k]) } # <= here  
    end  
  end  
end
```

### Compiled C code:

```
#include "/tmp/_ruby_mjit_hp24627u0.h"  
/* block in each@/home/***/vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/map.rb:21 */  
#undef OPT_CHECKED_RUN
```

```

#define OPT_CHECKED_RUN 0

VALUE
_mjitl128(rb_execution_context_t *ec, rb_control_frame_t *reg_cfp)
{
    VALUE stack[3];
    static const VALUE *const original_body_iseq = (VALUE *)0x5559463fe030;

label_0: /* nop */
{
    MAYBE_UNUSED(unsigned int) stack_size = 0;
    {
        /* none */
    }
}

label_1: /* getlocal_WC_0 */
{
    MAYBE_UNUSED(unsigned int) stack_size = 0;
    MAYBE_UNUSED(VALUE) val;
    MAYBE_UNUSED(lindex_t) idx;
    MAYBE_UNUSED(rb_num_t) level;
    level = 0;
    idx = (lindex_t)0x3;
    {
        val = *(vm_get_ep(GET_EP(), level) - idx);
        RB_DEBUG_COUNTER_INC(lvar_get);
        (void)RB_DEBUG_COUNTER_INC_IF(lvar_get_dynamic, level > 0);
    }
    stack[0] = val;
}

label_3: /* putself */
{
    MAYBE_UNUSED(unsigned int) stack_size = 1;
    MAYBE_UNUSED(VALUE) val;
    {
        val = GET_SELF();
    }
    stack[1] = val;
}

label_4: /* getlocal_WC_0 */
{
    MAYBE_UNUSED(unsigned int) stack_size = 2;
    MAYBE_UNUSED(VALUE) val;
    MAYBE_UNUSED(lindex_t) idx;
    MAYBE_UNUSED(rb_num_t) level;
    level = 0;
    idx = (lindex_t)0x3;
    {
        val = *(vm_get_ep(GET_EP(), level) - idx);
        RB_DEBUG_COUNTER_INC(lvar_get);
        (void)RB_DEBUG_COUNTER_INC_IF(lvar_get_dynamic, level > 0);
    }
    stack[2] = val;
}

label_6: /* opt_aref */
{
    MAYBE_UNUSED(unsigned int) stack_size = 3;
    if (UNLIKELY(GET_GLOBAL_METHOD_STATE() != 195 ||
        RCLASS_SERIAL(CLASS_OF(stack[1])) != 129007)) {
        reg_cfp->pc = original_body_iseq + 6;
        reg_cfp->sp = (VALUE *)reg_cfp->bp + 4;
        goto cancel;
    }
}

```

```

reg_cfp->pc = original_body_iseq + 9;
reg_cfp->sp = (VALUE *)reg_cfp->bp + 2 + 1;
*(reg_cfp->sp + -2) = stack[1];
*(reg_cfp->sp + -1) = stack[2];
{
    struct rb_calling_info calling;
    calling.block_handler = VM_BLOCK_HANDLER_NONE;
    calling argc = 1;
    calling.recv = stack[1];
    {
        VALUE v;
        vm_call_iseq_setup_normal(ec, reg_cfp, &calling, (const rb_callable_method_entry_t *)
0x5559464066f0, 0, 1, 1);
        if ((v = mjit_exec(ec)) == Qundef) {
            VM_ENV_FLAGS_SET(ec->cfp->ep, VM_FRAME_FLAG_FINISH);
            v = vm_exec(ec, FALSE);
        }
        stack[1] = v;
    }
}
if (UNLIKELY(ruby_vm_event_enabled_global_flags & ISEQ_TRACE_EVENTS)) {
    reg_cfp->sp = (VALUE *)reg_cfp->bp + 3;
    goto cancel;
}
}

label_9: /* invokeblock */
{
    MAYBE_UNUSED(unsigned int) stack_size = 2;
    MAYBE_UNUSED(CALL_INFO) ci;
    MAYBE_UNUSED(VALUE) val;
    ci = (CALL_INFO)0x5559463fdef0;
    reg_cfp->pc = original_body_iseq + 11;
    reg_cfp->sp = (VALUE *)reg_cfp->bp + 2 + 1;
    *(reg_cfp->sp + -2) = stack[0];
    *(reg_cfp->sp + -1) = stack[1];
    {
        struct rb_calling_info calling;
        VALUE block_handler;

        calling argc = ci->orig_argc;
        calling.block_handler = VM_BLOCK_HANDLER_NONE;
        calling.recv = Qundef; /* should not be used */

        block_handler = VM_CF_BLOCK_HANDLER(GET_CFP());
        if (block_handler == VM_BLOCK_HANDLER_NONE) {
            rb_vm_localjump_error("no block given (yield)", Qnil, 0);
        }

        val = vm_invoke_block(ec, GET_CFP(), &calling, ci, block_handler);
        if (val == Qundef) {
            EXEC_EC_CFP(val);
        }
    }
    stack[0] = val;
    if (UNLIKELY(ruby_vm_event_enabled_global_flags & ISEQ_TRACE_EVENTS)) {
        reg_cfp->sp = (VALUE *)reg_cfp->bp + 2;
        goto cancel;
    }
}

label_11: /* leave */
{
    MAYBE_UNUSED(unsigned int) stack_size = 1;
    MAYBE_UNUSED(VALUE) val;
    val = stack[0];
    reg_cfp->pc = original_body_iseq + 12;
}

```

```

reg_cfp->sp = (VALUE *)reg_cfp->bp + 0 + 1;
{
  if (OPT_CHECKED_RUN) {
    const VALUE *const bp = vm_base_ptr(reg_cfp);
    if (reg_cfp->sp != bp) {
      vm_stack_consistency_error(ec, reg_cfp, bp);
    }
  }
}

RUBY_VM_CHECK_INTS(ec);

if (vm_pop_frame(ec, GET_CFP(), GET_EP())) {
#if OPT_CALL_THREADED_CODE
  rb_ec_thread_ptr(ec)->retval = val;
  return 0;
#else
  return val;
#endif
}
else {
#if OPT_CALL_THREADED_CODE
  rb_ec_thread_ptr(ec)->retval = val;
  return 0;
#else
  return val;
#endif
}
}
stack[0] = val;
if (UNLIKELY(ruby_vm_event_enabled_global_flags & ISEQ_TRACE_EVENTS)) {
  reg_cfp->sp = (VALUE *)reg_cfp->bp + 2;
  goto cancel;
}
}

cancel:
*((VALUE *)reg_cfp->bp + 1) = stack[0];
*((VALUE *)reg_cfp->bp + 2) = stack[1];
*((VALUE *)reg_cfp->bp + 3) = stack[2];
return Qundef;

} /* end of _mjit1128 */

```

#### Stack Trace:

```

vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/map.rb:21:in `block in each'
vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/map.rb:21:in `each'
vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/map.rb:21:in `each'
vendor/bundle/ruby/2.6.0/gems/haml-5.0.4/lib/haml/options.rb:172:in `initialize'
vendor/bundle/ruby/2.6.0/gems/haml-5.0.4/lib/haml/options.rb:44:in `new'
vendor/bundle/ruby/2.6.0/gems/haml-5.0.4/lib/haml/options.rb:44:in `wrap'
vendor/bundle/ruby/2.6.0/gems/haml-5.0.4/lib/haml/parser.rb:93:in `initialize'
vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/mixins/engine_dsl.rb:101:in `new'
vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/mixins/engine_dsl.rb:101:in `block in chain_
proc_constructor'
vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/engine.rb:61:in `block in call_chain'
vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/engine.rb:60:in `map'
vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/engine.rb:60:in `call_chain'
vendor/bundle/ruby/2.6.0/gems/temple-0.8.0/lib/temple/engine.rb:50:in `call'
vendor/bundle/ruby/2.6.0/gems/haml-5.0.4/lib/haml/temple_engine.rb:41:in `compile'
vendor/bundle/ruby/2.6.0/gems/haml-5.0.4/lib/haml/engine.rb:61:in `initialize'
vendor/bundle/ruby/2.6.0/gems/haml-5.0.4/lib/haml/plugin.rb:16:in `new'
vendor/bundle/ruby/2.6.0/gems/haml-5.0.4/lib/haml/plugin.rb:16:in `compile'
vendor/bundle/ruby/2.6.0/gems/haml-5.0.4/lib/haml/plugin.rb:23:in `call'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/template.rb:283:in `compile'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/template.rb:259:in `block (2 levels
) in compile!'

```

```
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/notifications.rb:170:in `instrument'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/template.rb:350:in `instrument'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/template.rb:258:in `block in compile!'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/template.rb:246:in `synchronize'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/template.rb:246:in `compile!'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/template.rb:158:in `block in render'
'
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/notifications.rb:170:in `instrument'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/template.rb:354:in `instrument_render_template'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/template.rb:157:in `render'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/renderer/template_renderer.rb:54:in `block (2 levels) in render_template'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/renderer/abstract_renderer.rb:44:in `block in instrument'
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/notifications.rb:168:in `block in instrument'
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/notifications/instrumenter.rb:23:in `instrument'
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/notifications.rb:168:in `instrument'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/renderer/abstract_renderer.rb:43:in `instrument'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/renderer/template_renderer.rb:53:in `block in render_template'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/renderer/template_renderer.rb:61:in `render_with_layout'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/renderer/template_renderer.rb:52:in `render_template'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/renderer/template_renderer.rb:16:in `render'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/renderer/renderer.rb:44:in `render_template'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/renderer/renderer.rb:25:in `render'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/rendering.rb:103:in `_render_template'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/streaming.rb:219:in `_render_template'
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/rendering.rb:84:in `render_to_body'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/rendering.rb:52:in `render_to_body'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/renderers.rb:142:in `render_to_body'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/abstract_controller/rendering.rb:25:in `render'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/rendering.rb:36:in `render'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/instrumentation.rb:46:in `block (2 levels) in render'
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/core_ext/benchmark.rb:14:in `block in ms'
/usr/local/anyenv/envs/rbenv/versions/2.6.0-rc1/lib/ruby/2.6.0/benchmark.rb:308:in `realtime'
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/core_ext/benchmark.rb:14:in `ms'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/instrumentation.rb:46:in `block in render'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/instrumentation.rb:87:in `cleanup_view_runtime'
vendor/bundle/ruby/2.6.0/gems/activerecord-5.2.2/lib/active_record/railties/controller_runtime.rb:31:in `cleanup_view_runtime'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/instrumentation.rb:45:in `render'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/implicit_render.rb:35:in `default_render'
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/basic_implicit_render.r
```

```
b:6:in `block in send_action'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/basic_implicit_render.r  
b:6:in `tap'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/basic_implicit_render.r  
b:6:in `send_action'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/abstract_controller/base.rb:194:in `process_act  
ion'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/rendering.rb:30:in `pro  
cess_action'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/abstract_controller/callbacks.rb:42:in `block i  
n process_action'  
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/callbacks.rb:132:in `run_call  
backs'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/abstract_controller/callbacks.rb:41:in `process  
_action'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/rescue.rb:22:in `proces  
s_action'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/instrumentation.rb:34:i  
n `block in process_action'  
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/notifications.rb:168:in `bloc  
k in instrument'  
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/notifications/instrumenter.rb  
:23:in `instrument'  
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/notifications.rb:168:in `inst  
rument'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/instrumentation.rb:32:i  
n `process_action'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal/params_wrapper.rb:256:i  
n `process_action'  
vendor/bundle/ruby/2.6.0/gems/activerecord-5.2.2/lib/active_record/railties/controller_runtime.rb:  
24:in `process_action'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/abstract_controller/base.rb:134:in `process'  
vendor/bundle/ruby/2.6.0/gems/actionview-5.2.2/lib/action_view/rendering.rb:32:in `process'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal.rb:191:in `dispatch'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_controller/metal.rb:252:in `dispatch'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/routing/route_set.rb:52:in `dis  
patch'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/routing/route_set.rb:34:in `ser  
ve'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/journey/router.rb:52:in `block  
in serve'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/journey/router.rb:35:in `each'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/journey/router.rb:35:in `serve'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/routing/route_set.rb:840:in `ca  
ll'  
vendor/bundle/ruby/2.6.0/gems/http_accept_language-2.1.1/lib/http_accept_language/middleware.rb:14  
:in `call'  
vendor/bundle/ruby/2.6.0/gems/rack-2.0.6/lib/rack/tempfile_reaper.rb:15:in `call'  
vendor/bundle/ruby/2.6.0/gems/rack-2.0.6/lib/rack/etag.rb:25:in `call'  
vendor/bundle/ruby/2.6.0/gems/rack-2.0.6/lib/rack/conditional_get.rb:25:in `call'  
vendor/bundle/ruby/2.6.0/gems/rack-2.0.6/lib/rack/head.rb:12:in `call'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/http/content_security_policy.rb  
:18:in `call'  
vendor/bundle/ruby/2.6.0/gems/rack-2.0.6/lib/rack/session/abstract/id.rb:232:in `context'  
vendor/bundle/ruby/2.6.0/gems/rack-2.0.6/lib/rack/session/abstract/id.rb:226:in `call'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/middleware/cookies.rb:670:in `c  
all'  
vendor/bundle/ruby/2.6.0/gems/activerecord-5.2.2/lib/active_record/migration.rb:559:in `call'  
config/initializers/check_access_control.rb:14:in `call'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/middleware/callbacks.rb:28:in `  
block in call'  
vendor/bundle/ruby/2.6.0/gems/activesupport-5.2.2/lib/active_support/callbacks.rb:98:in `run_callb  
acks'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/middleware/callbacks.rb:26:in `  
call'  
vendor/bundle/ruby/2.6.0/gems/actionpack-5.2.2/lib/action_dispatch/middleware/executor.rb:14:in `c  
all'
```



```
ruby --jit rails bootsnap SEGV bootsnap Gemfile
gem 'bootsnap' config/boot.rb require 'bootsnap/setup'
```

```
ruby --jit-verbose=1 --jit-save-temps bin/rails server -pXXXX
SEGV SEGV JIT C
```

#3 - 12/11/2018 03:36 AM - Tietew (Toru Iwase)

```
bootsnap
SEGV
Puma fatal ^C KILL
```

- bootsnap bootsnap →
- Puma → [BUG] vm\_call\_cfunc: cfp consistency error (0x00005634298876e8, 0x0000563429887b80) SEGV

#4 - 12/11/2018 04:05 AM - k0kubun (Takashi Kokubun)

```
SEGV
```

```
"--jit rails bootsnap SEGV" load_from_binary cfp consistency
error
bootsnap Ruby 2.6 bootsnap
```

#5 - 12/11/2018 04:16 AM - Tietew (Toru Iwase)

```
template/map.rb
```

Gemfile

```
source "https://rubygems.org"
gem "bootsnap", require: false
gem "template"
```

test.rb

```
require 'bundler/setup'
require 'bootsnap'
Bootsnap.setup(
  cache_dir: 'bootsnap',
  development_mode: true,
  load_path_cache: true,
  autoload_paths_cache: false,
  disable_trace: false,
  compile_cache_iseq: true,
  compile_cache_yaml: true
)

require 'template/map'

orig = {}
10000.times { orig[rand(100000)] = rand(100000) }

a = Temple::ImmutableMap.new(orig)
i = 0
1000.times { a.each { |k, v| puts(i += 1) } }
```

Run:

```
$ ruby --jit-verbose=1 test.rb
1
2
...(snip)...
94735
94736
94737 JIT success (98.6ms): block (2 levels) in initialize@/home/tietew/projects/test/ruby260/vendor/bundle/rub
y/2.6.0/gems/bootsnap-1.3.2/lib/bootsnap/load_path_cache/loaded_features_index.rb:35 -> /tmp/_ruby_mjit_p30674
u328.c
94738
```





