[PATCH] introduce String#fstring method

This exposes the rb_fstring internal function to return a deduped and frozen string. This is useful for writing all sorts of record processing key values maybe stored, but certain keys and values are often duplicated at a high frequency, so memory savings can noticeable.

Use cases are many:

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  There are some standard header keys everybody uses (From/To/Cc/Date/Subject/Received/Message-ID/References/In-Reply-To), as well as common ones specific to a certain lists: (ruby-core has X-Redmine-* headers)
  It is also useful to dedupe values, as most inboxes have multiple messages from the same sender, or MUA.

- package management systems -
  things like RubyGems stores identical strings for licenses, dependency names, author names/emails, etc

- HTTP headers/trailers -
  standard headers (Host/Accept/Accept-Encoding/User-Agent/...}
  are common, but there are also uncommon ones.
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  this can be useful for deduplicating names of frequent committers (like "nobu" ;)

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- JSON, YAML, XML, HTML processing
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[Feature #13077] [ruby-core:79663]

git-svn-id: svn+ssh://ci.ruby-lang.org/ruby/trunk@57698 b2dd03c8-39d4-4d8f-98ff-823fe69b080e

**Revision 57698** - **02/24/2017 01:01 AM - normalperson (Eric Wong)**

string.c (str_uminus): deduplicate strings

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[Feature #13077] [ruby-core:79663]

Revision 15ef28a9 - 02/25/2017 02:31 AM - normal
NEWS: document String#-@ change
- test/ruby/test_string.rb (test_uplus_minus): test deduplication [ruby-core:79747] [Feature #13077]

git-svn-id: svn+ssh://ci.ruby-lang.org/ruby/trunk@57710 b2dd03c8-39d4-4d8f-98ff-823fe69b080e

Revision 57710 - 02/25/2017 02:31 AM - normalperson (Eric Wong)
NEWS: document String#-@ change
- test/ruby/test_string.rb (test_uplus_minus): test deduplication [ruby-core:79747] [Feature #13077]

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History

#1 - 12/27/2016 03:54 PM - shevegen (Robert A. Heiler)
I have no particular pro or con opinion on the proposal in itself so feel free to ignore this.

The only comment I have is that the name .fstring() is a bit strange. On first read, I assumed that it was short for "format_string" like % on class String or sprintf.

In the proposal I read that it is for frozen_string e. g. rb_fstring. While I don't have anything against the functionality, and I also don't fully mind a method called fstring(), I think that at the least a longer alias name to it would be nice to have too such as frozen_string or something that is more readable on a first look. (I can't comment
on whether the functionality in itself is useful or not but I assume that Eric has had a good reason which he described too, so I have no qualms at all with the functionality in itself, only the method-name part.)

#2 - 12/27/2016 06:41 PM - normalperson (Eric Wong)

shevegen@gmail.com wrote:

The only comment I have is that the name .fstring() is a bit strange. On first read, I assumed that it was short for "formal_string" like % on class String or sprintf.

Yeah, the name isn't final, of course; naming is the hardest problem in computer science :<

Maybe "dedup" is better and still short (I would expect the user to know deduplication implicitly requires a frozen string)

#3 - 12/27/2016 10:15 PM - Eregon (Benoit Daloze)

So this is essentially like Java's String.intern()?

There is already String#intern in Ruby but it returns a Symbol. Depending on the use-case, I guess this might be less convenient than getting a de-duplicated String, String#dedup or sounds better than #fstring.

#4 - 12/27/2016 11:41 PM - normalperson (Eric Wong)

eregontp@gmail.com wrote:

So this is essentially like Java's String.intern()?

There is already String#intern in Ruby but it returns a Symbol. Depending on the use-case, I guess this might be less convenient than getting a de-duplicated String.

Yeah, I considered using intern/to_sym for my use case; but the problem is it that still creates a new string object whenever it needs to be written/printed/concatenated.

And I also feel using symbol like this is ugly (just a gut feeling), despite having GC-able symbols since 2.2.

String#dedup or sounds better than #fstring.

Yes. Lets wait for Matz to comment.

#5 - 12/28/2016 12:08 AM - nobu (Nobuyoshi Nakada)

Why not String#-@?

#6 - 12/28/2016 03:03 AM - normalperson (Eric Wong)

nobu@ruby-lang.org wrote:

Why not String#-@?

As in the following? (short patch, full below)

--- a/string.c
+++ b/string.c
@@ -10002,7 +9989,7 @@ Init_String(void)
                     "scrub!", str_scrub_bang, -1);
     rb_define_method(rb_cString, "freeze", rb_str_freeze, 0);
     rb_define_method(rb_cString, "+%", str_uplus, 0);
-    rb_define_method(rb_cString, "-@", str_uminus, 0);
+    rb_define_method(rb_cString, "-@", rb_fstring, 0);
     rb_define_method(rb_cString, "to_i", rb_str_to_i, -1);
     rb_define_method(rb_cString, "to_f", rb_str_to_f, 0);

Changing existing behavior method might break compatibility; but test-all and test-rubyspec seems to pass...
For the time being, let us make -@ to call rb_fstring. If users want more descriptive name, let's discuss later. In my opinion, fstring is not acceptable.

Matz.

For the time being, let us make -@ to call rb_fstring. If users want more descriptive name, let's discuss later. In my opinion, fstring is not acceptable.

OK, I think the following is always backwards compatible, unlike my previous [ruby-core:78884]:

```c
--- a/string.c
+++ b/string.c
@@ -2530,7 +2530,7 @@ str_uminus(VALUE str)
     return str;
     }
-    return rb_str_freeze(rb_str_dup(str));
+    return rb_fstring(str);
    }
```

Will commit in a day or two.

A bit of security consideration:

Am I correct that rb_vm_fstring_table() is never GCed? If so feeding user-generated strings to that table needs extra care. Malicious user input might let memory exhausted.

That table is not a GC-root, and registered strings get GCed as usual.

So this is a kind of weak reference? No security concern then.

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[Feature #13077 [ruby-core:79663]]

#13 - 02/24/2017 01:05 AM - normalperson (Eric Wong)

shyouhei@ruby-lang.org wrote:

Nobuyoshi Nakada wrote:

Shyouhei Urabe wrote:

  Am I correct that rb_vm_fstring_table() is never GCed?

  That table is not a GC-root, and registered strings get GCed as usual.

So this is a kind of weak reference? No security concern then.
Right. Also, keep in mind that dynamic GC-able symbols from 2.2+ also stores symbol names as fstrings. Thus GC-able symbols would not work if fstrings could not be GC-ed.

Anyways, committed as r57698

#14 - 02/24/2017 10:28 AM - Eregon (Benoit Daloze)

Eric Wong wrote:

Anyways, committed as r57698

This should have a NEWS entry and tests since it changes the semantics.

BTW, should my_string.freeze behave similarly to String#-?
Otherwise String#freeze only dedup if the String is a literal.
Always deduping for String#freeze would make the semantics more consistent.

#15 - 02/25/2017 02:11 AM - normalperson (Eric Wong)

erezontp@gmail.com wrote:

Eric Wong wrote:

Anyways, committed as r57698

This should have a NEWS entry and tests since it changes the semantics.

Sorry, I forgot; will do. Thanks for the reminder.

BTW, should my_string.freeze behave similarly to String#-?
Otherwise String#freeze only dedup if the String is a literal.
Always deduping for String#freeze would make the semantics more consistent.

No. There is existing code which assumes #freeze always returns the same object as its caller. Changing #freeze will break existing code.

We can only cheat with String literals (opt_str_freeze) because literals are not assigned to user-visible variables, yet.

#16 - 02/25/2017 08:53 PM - Eregon (Benoit Daloze)

Eric Wong wrote:

No. There is existing code which assumes #freeze always returns the same object as its caller. Changing #freeze will break existing code.

We can only cheat with String literals (opt_str_freeze) because literals are not assigned to user-visible variables, yet.

Oh indeed, that slipped my mind, thanks for the explanation.

#17 - 09/04/2020 09:58 AM - naruse (Yui NARUSE)

- Has duplicate Feature #17147: New method to get frozen strings from String objects added

Files

<table>
<thead>
<tr>
<th>Files</th>
<th>Size</th>
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<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001-introduce-String-fstring-method.patch</td>
<td>3.47 KB</td>
<td>12/27/2016</td>
<td>normalperson (Eric Wong)</td>
</tr>
</tbody>
</table>