

Solved In Perl 6

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Baltic Perl Workshop 2009



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OH HAI

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.WHO

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Perl 6 Hacker

**Work on the Rakudo Perl 6
compiler**

**Focus on the object model, type
system and multiple dispatch**

Traveller

Latvia is the 33rd country I have visited so far



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Beer Drinker

Beer is tasty.

I drink it.



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Perl 6 and Rakudo

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Perl 6

- Takes the key concepts of Perl...
 - Influence of linguistics
 - Get the job done
- Create a new, Perl-ish language with many similarities to Perl 5, but also many differences, e.g.
 - Syntactic improvements (cleaner, better huffmanized)
 - New features

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Rakudo

- The most actively developed Perl 6 compiler
- Implements a wide range of Perl 6 features
- Currently only targets Parrot; in the future, we expect to support more backends (even within the coming months)
 - We're reaching the point where they'll help rather than distract us from getting to a full Perl 6 specification and implementation
 - Appeal to more users and developers

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Rakudo Star

- A significant release of Rakudo scheduled for Spring 2010
- Not all of Perl 6, but a significant part of it
 - A lot of the Perl 6 promised features can be found within Rakudo
 - All code that I will show today runs on Rakudo already
- Aim to be usable and useful

**What's this
talk about?**

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Overview

- I'll take a range of everyday programming problems and for each one show...
 - The Perl 6 code that solves it
 - The output that code gives when run
- Hopefully, a good way for you to start to grasp some of the new syntax and features
- A chance to show off some of the cool stuff in Perl 6
- All examples shown today work in Rakudo

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Problem

Say "Hello, world"

Solution

```
say "Hello, world!"
```

Output

```
Hello, world!
```

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Problem

Read input from the console

Solution

```
print "Enter your name: ";  
my $name = $*IN.get;  
say "Hi $name!";
```

Output

```
Enter your name: Jonathan  
Hi Jonathan!
```

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Problem

Check a value is in a given range

Solution 1

```
loop {  
    print "Enter a number from 1 to 10: ";  
    my $num = $*IN.get;  
    unless 1 <= $num <= 10 { say "Fail!" }  
}
```

Output

```
Enter a number between 1 and 10: 3  
Enter a number between 1 and 10: 42  
Fail!
```

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Problem

Check a value is in a given range

Solution 2

```
loop {  
    print "Enter a number from 1 to 10: ";  
    my $num = $*IN.get;  
    unless $num ~~ 1..10 { say "Fail!" }  
}
```

Output

```
Enter a number between 1 and 10: 3  
Enter a number between 1 and 10: 42  
Fail!
```


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Problem

Add up a list of numbers

Solution

```
my @nums = 1, 5, 7, -2, 3, 9, 11, -6, 14;  
say [+] @nums;
```

Output

42

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Problem

Check if a list is sorted

Solution

```
my @a = 1, 1, 2, 3, 5, 8;  
my @b = 9, 4, 1, 16, 36, 25;  
if [<=] @a { say '@a is sorted' }  
if [<=] @b { say '@b is sorted' }
```

Output

```
@a is sorted
```

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Problem

Get a Perl-ish representation of a data structure
(Data::Dumper style)

Solution

```
my @a = 1, 2, 3;  
push @a, { x => 42, y => 100 };  
say @a.perl;
```

Output

```
[1, 2, 3, {"y" => 100, "x" => 42}]
```

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Problem

Iterate over a list

Solution

```
my @cities = <Lisbon Tokyo Seoul Riga>;  
for @cities -> $city {  
    say "I've been to $city";  
}
```

Output

```
I've been to Lisbon  
I've been to Tokyo  
I've been to Seoul  
I've been to Riga
```


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Problem

Iterate over the keys and values of a hash

Solution

```
my %distances =  
    Bratislava => 1084,  
    Stockholm  => 442;  
for %distances.kv -> $city, $distance {  
    say "$city is $distance km away";  
}
```

Output

```
Bratislava is 1084 km away  
Stockholm is 442 km away
```

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Problem

Check if any of a list of test scores is a pass

Solution

```
my @a = 75, 47, 90, 22, 80;  
my @b = 61, 77, 94, 82, 60;  
my @c = 45, 59, 33, 11, 19;  
if any(@a) >= 60 { say "Some passes in A" }  
if any(@b) >= 60 { say "Some passes in B" }  
if any(@c) >= 60 { say "Some passes in C" }
```

Output

```
Some passes in A  
Some passes in B
```

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Problem

Check if all of a list of test scores are passes

Solution

```
my @a = 75, 47, 90, 22, 80;  
my @b = 61, 77, 94, 82, 60;  
my @c = 45, 59, 33, 11, 19;  
if all(@a) >= 60 { say "All passes in A" }  
if all(@b) >= 60 { say "All passes in B" }  
if all(@c) >= 60 { say "All passes in C" }
```

Output

```
All passes in B
```

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Problem

Check if none of a list of test scores is a pass

Solution

```
my @a = 75, 47, 90, 22, 80;  
my @b = 61, 77, 94, 82, 60;  
my @c = 45, 59, 33, 11, 19;  
if none(@a) >= 60 { say "No passes in A" }  
if none(@b) >= 60 { say "No passes in B" }  
if none(@c) >= 60 { say "No passes in C" }
```

Output

```
No passes in C
```


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Problem

Get a random item from a list

Solution

```
my @drinks = <wine beer vodka>;  
say "Tonight I'll drink { @drinks.pick }";
```

Output (results should vary ;-))

```
Tonight I'll drink vodka
```

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Problem

Shuffle a list into a random order

Solution

```
my @competitors = <Tina Lena Owen Peter>;  
my @order = @competitors.pick(*);  
for @order { .say }
```

Output (results should vary ;-))

```
Peter  
Lena  
Owen  
Tina
```

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Problem

Write and call a subroutine with parameters

Solution

```
sub greet($name) {  
    say "OH HAI $name!";  
}  
greet("masak");
```

Output

```
OH HAI masak
```

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Problem

Write a subroutine taking an array and a hash

Solution

```
sub example(@a, %h) {  
    say @a.elems;  
    say %h.keys;  
}  
  
my @nums = 42, 57, 74;  
my %mapping = a => 1, b => 2;  
example(@nums, %mapping);
```

Output

```
3  
ab
```

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Problem

Write a subroutine that only takes a number

Solution

```
sub double(Num $n) { 2 * $n }  
say double(21);  
say double("oh no I'm not a number");
```

Output

42

Parameter type check failed; expected Num,
but got Str for \$n in call to double

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Problem

Use multi-subsubs to react differently by type

Solution

```
multi double(Num $n) { 2 * $n }  
multi double(Str $s) { $s x 2 }  
say double(21);  
say double("boo");
```

Output

```
42  
booboo
```


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Problem

Compute factorial (recursively)

Solution

```
multi fact($n) { $n * fact($n - 1) }  
multi fact(0)  { 1 }  
say fact(1);  
say fact(10);
```

Output

```
1  
3628800
```

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Problem

Compute factorial (using a meta-operator)

Solution

```
sub fact($n) { [*] 1..$n }  
say fact(1);  
say fact(10);
```

Output

```
1  
3628800
```

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Problem

Add a new factorial operator (so 10! works)

Solution

```
sub postfix:<!>($n) { [*] 1..$n }  
say 1!;  
say 10!;
```

Output

```
1  
3628800
```

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Problem

Declare a class with attributes and a method

Solution

```
class Product {  
    has $.name;    # Attr + accessor  
    has $!price;   # Attr only  
    has $.discount is rw;  
                    # Attr + lvalue accessor  
    method get_price {  
        return $!price - $!discount;  
    }  
}
```

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Problem

Instantiate a class and call a method on it

Solution

```
my $prod = Product.new(  
    name      => "Beer",  
    price     => 500,  
    discount  => 60  
);  
say $prod.get_price;
```

Output

440

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Problem

Get/set attributes through accessors

Solution

```
say $prod.name;  
$prod.discount = 40;  
say $prod.get_price;  
$prod.name = 'Wine';
```

Output

```
Beer
```

```
460
```

```
Cannot assign to readonly variable.
```


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Problem

Call a method on every object in a list

Solution

```
my @products =  
    Product.new(name => 'Beer', price => 500),  
    Product.new(name => 'Wine', price => 450),  
    Product.new(name => 'Vodka', price => 1600);  
my @uc_names = @products>>.name>>.uc;  
for @uc_names { .say }
```

Output

```
BEER  
WINE  
VODKA
```

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Problem

Introspect a class to find its methods

Solution

```
my @meths = Product.^methods(:local);  
for @meths>>.name { .say }
```

Output

```
get_price  
discount  
name
```

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Problem

Sort an array of objects by result of a method

Solution (Example 1)

```
my @products =  
    Product.new(name => 'Beer', price => 500),  
    Product.new(name => 'Wine', price => 450),  
    Product.new(name => 'Vodka', price => 1600);  
my @sorted = @products.sort(*.name);  
for @sorted { .name.say }
```

Output (Example 1)

```
Beer  
Vodka  
Wine
```

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Problem

Sort an array of objects by result of a method

Solution (Example 2)

```
my @products =  
    Product.new(name => 'Beer', price => 500),  
    Product.new(name => 'Wine', price => 450),  
    Product.new(name => 'Vodka', price => 1600);  
my @sorted = @products.sort(*.get_price);  
for @sorted { .name.say }
```

Output (Example 2)

```
Wine  
Beer  
Vodka
```

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Problem

Find minimum and maximum values from a list

Solution (Example 1)

```
my @temperatures = -3, 5, 7, 2, -1, -4, 0;  
say "Minimum was " ~ @temperatures.min;  
say "Maximum was " ~ @temperatures.max;
```

Output (Example 1)

```
Minimum was -4  
Maximum was 7
```

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Problem

Find minimum and maximum values from a list

Solution (Example 2)

```
my @products =  
    Product.new(name => 'Beer', price => 500),  
    Product.new(name => 'Wine', price => 450),  
    Product.new(name => 'Vodka', price => 1600);  
say "Cheapest: " ~ @products.min(*.get_price).name;  
say "Costliest: " ~ @products.max(*.get_price).name;
```

Output (Example 2)

```
Cheapest: Wine  
Costliest: Vodka
```


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Problem

Paper, Scissor, Stone game

Solution (Part 1)

```
class Paper { }  
class Scissor { }  
class Stone { }  
multi win(Paper, Stone) { "Win" }  
multi win(Scissor, Paper) { "Win" }  
multi win(Stone, Scissor) { "Win" }  
multi win(::T, T) { "Draw" }  
multi win(Any, Any) { "Lose" }
```

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Problem

Paper, Scissor, Stone game

Solution (Part 2)

```
say win(Paper, Paper);  
say win(Scissor, Stone);  
say win(Stone, Scissor);
```

Output

```
Draw  
Lose  
Win
```

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Want to play with Perl 6?

- Rakudo – the most actively developed Perl 6 compiler – is available from:
<http://www.rakudo.org/>
- Lots of Perl 6 resources can be found at:
<http://www.perl6.org/>
- Join the friendly IRC channel:
#perl6 on irc.freenode.org
- Write modules, write applications, jump into the evolving Perl 6 community and make your mark on it 😊

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Thank You

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Questions?