Work on project. Stage 4/4: Convert fractions

Project: Number Base Converter

📶 Hard   🕐 3 hours   ❓

Description

Fractional numbers can also be converted from one base to another, so let's add this functionality to our program!

To convert a fractional number from one base to another, you need to split the number into two parts: integer and fractional. Convert each part from their base to decimal independently and then convert them (once again, separately) to the target base. Finally, combine both parts and get the final result!

The most challenging part will probably be converting the decimal fractional part to the target base. Don't worry, though: since you already know how to convert fractions from decimal to binary, it should not be a problem for you! Converting fractions from decimal to any base is practically the same: just use the proper denominator, which is the target base, instead of **2**.

The example below shows how to convert the number 0.375 from decimal to base 20:

Fractional	Integer
0.375 * 20 =	**7** + 0.5
0.5 * 20 =	**10** + 0.0

Result: $0.375_{10} = 0.7a_{20}$

Just like in the previous stage, the input numbers can be large. You might want to consider using `java.math.BigDecimal` to handle large fractions. Check the documentation on BigDecimal.

Objectives

Your program should behave almost the same way as in the previous stage: the two-level menu and the commands stay the same.

When your program gets a fractional number, it should output its representation in the target base rounded to 5 characters (digits or letters) in the fractional part. If there is no fractional part in the initial number, it should be omitted in the resulting number, too.

Example

The greater-than symbol followed by a space (>) represents the user input. Note that it's not part of the input.

2 / 2 Prerequisites

✓ BigDecimal

✓ Decimal to binary: fractions

Join a study group for the project Number Base Converter

Discuss your current project with fellow learners and help each other.

```
Enter two numbers in format: {source base} {target base} (To quit type /exit) > 10 7
Enter number in base 10 to convert to base 7 (To go back type /back) > 0.234
Conversion result: 0.14315

Enter number in base 10 to convert to base 7 (To go back type /back) > 10.234
Conversion result: 13.14315

Enter number in base 10 to convert to base 7 (To go back type /back) > /back

Enter two numbers in format: {source base} {target base} (To quit type /exit) > 35 17
Enter number in base 35 to convert to base 17 (To go back type /back) > af.xy
Conversion result: 148.g88a8

Enter number in base 35 to convert to base 17 (To go back type /back) > aaaa.0
Conversion result: 54e36.00000

Enter number in base 35 to convert to base 17 (To go back type /back) > /back

Enter two numbers in format: {source base} {target base} (To quit type /exit) > 21 10
Enter number in base 21 to convert to base 10 (To go back type /back) > 4242
Conversion result: 38012

Enter number in base 21 to convert to base 10 (To go back type /back) > 4242.13a
Conversion result: 38012.05550

Enter number in base 21 to convert to base 10 (To go back type /back) > /back

Enter two numbers in format: {source base} {target base} (To quit type /exit) > /exit
```

🖹 Report a typo

⚡ See hint

⌐ Write a program

Code Editor   **IDE**

Java

1

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MM **Margarita Marchenko** 14 days ago

In script "BigDecimal resInDecimal = new BigDecimal("0");" - the start number to which the result is added.
if it is replaced by "BigDecimal resInDecimal = BigDecimal.ZERO" - test is correct only one time from 2.

☺ Reply   Report

MM **Margarita Marchenko** 14 days ago

So strange! BigNumbers was absolutely new topic, but % of completion of project stages has not increased. Whyyyyyyyyy?=)

☺ Reply   Report

d **duckar** 3 months ago

"Wrong answer in test #6
The fractional part of your conversion should only be 5 digits in length"

"Enter number in base 2 to convert to base 8 (To go back type /back)

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> d **duckar** 3 months ago
>
> Ok, i know. I have too few zeros in fractional part.
>
> ☺ Reply   Report

A **Aleksej Jakusev** 5 months ago (Bountied)

Hi. Does anybody have an idea how to extract a fractional part from a number and then convert it to targetbase? Any better hints than those are posted here?

☺ Reply   Report

K **Kjean** 6 months ago (Bountied)

Can someone help me with this?
Wrong answer in test #6

The fractional part of your conversion should only be 5 digits in length

☺ Reply   Show all   Report

> **Charles Soler** 6 months ago
>
> You're conversion has 8 decimal places. It needs to be rounded. I'm not sure how you are converting the number, but I'm guessing you have a string. You could split the string at the period, then get a substring(0, 6) of the String after the decimal, then concat the String before the decimal, and the new String. It's not a true round, it's truncated. It worked in my solution though... I might go back and round it for real.
>
> 👍 1   ☺   Reply   Report

Stan108 6 months ago (Bountied)

Can't find how to convert BigDecimal

👍 2   ☺   Reply   Report

Anvar Kalykov 6 months ago

I hate this course. I don't know how to convert BigDecimal to any base

☺ Reply   Report

> **Anastasia** 6 months ago
>
> the same shit, bro ;)
>
> 👍 2   👎 1   ☺   Reply   Report

Matthew Efe Takerhi 7 months ago

Use BigDecimal.plainString rather than BigDecimal.toString.

☺ Reply   Report

mat-su 7 months ago

I never know that you can get the decimal value of letters by doing this:
Character.getNumericValue('a') = 10
Character.getNumericValue('z') = 35

👍 5   ☺   Reply   Report

> MM **Margarita Marchenko** 14 days ago
>
> Thanks!
>
> ☺ Reply   Report

mat-su 7 months ago

I was surprised that there was a simplest and fastest way to convert a source to its target base.

https://www.geeksforgeeks.org/biginteger-tostring-method-in-java/

👍 2   ☺   Reply   Report

> U9   **User 92646548**   7 months ago
>
> Excellent find, although I'm not sure this is what the task intended! :)
>
> ☺   Reply   Report

🌐 **Gilbert Almazan**   7 months ago   (Bountied)

Exception in test #6

java.lang.NumberFormatException: Character f is neither a decimal digit number, decimal point, nor "e" notation exponential mark.
        at java.base/java.math.BigDecimal.<init>(BigDecimal.java:511)

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> 🌐 **Gilbert Almazan**   7 months ago
>
> https://pastebin.com/jAsvc00t
>
> can anyone teach me how to convert the fractal value into alphabets base on target base
>
> ☺   Reply   Report
>
> > U9   **User 92646548**   7 months ago
> >
> > Do you still need help Gilbert?
> >
> > ☺   Reply   Report
>
> 🔲 **Master of Ceremony**   7 months ago
>
> Ok so basically it looks like in that particular test a character 'f' has been passed as a parameter. So what you should do is validation of an input if passed parameter is a number type.
>
> ☺   Reply   Report

A   **Angelina**   8 months ago   (Bountied)

I do not pass test #6: "The conversion result of your program is wrong".
The given input is the number 110111010.10000 in base 2 and it shall be converted to base 5.
My output String is: "Conversion result: 3232.10000"

First, I split the fractional and integer parts and then I converted the fractional part to decimal from there I converted it with

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> 🌐 **Gilbert Almazan**   7 months ago
>
> same problem here
>
> ☺   Reply   Report
>
> 🟦 **Michał**   7 months ago
>
> Look at your fraction part - according to your answer it is the same in both base 2 and base 5 which cannot be true.
>
> 0.1 base 2 = 0.5 decimal
> 0.1 base 5 = 0.2 decimal
>
> ☺   Reply   Report

🔵 **Taz**   8 months ago

I believe course is incomplete it never taught us to convert decimal to any base

👍 7   💎 3   ☺   Reply   Report

> 🔵 **Taz**   8 months ago
>
> I am talking about decimal fraction to fraction of any base
>
> 👍 6   ☺   Reply   Report

U9 **User 92646548** 7 months ago

Hi, use this link and convert a simple number like 0.A
https://www.rapidtables.com/convert/number/hex-to-decimal.html

Then convert another like 0.A1

😊 Reply   Report

U9 **User 92646548** 7 months ago

Hi, use this link and convert a simple number like 0.A
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Then convert another like 0.A1

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