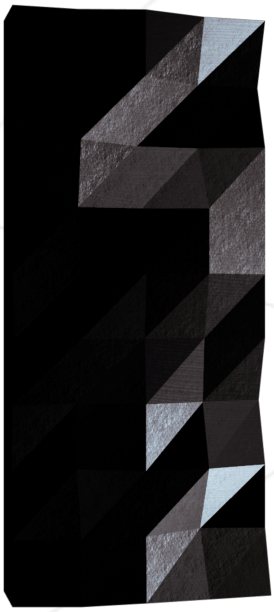

Starfleet Academy

Bistromatic

gaetan gaetan@42.fr
femi femi@42.us.org

Summary: This project welcomes you to the most exciting flight ever!

Contents

Chapter I

Foreword

"In 1905, Albert Einstein published his special theory of relativity, and his general theory of relativity was made public in 1915.

At first glance, it seems difficult to acknowledge practical, every day implications of Einstein's theories of relativity. We rarely find ourselves confronted with the dilemma of considering disparate inertial frames or extremely high velocities approaching the speed of light. However, the applications to nuclear energy production and synchronization of the global positioning system (GPS) satellites around the earth indicate an effect of relativity on our day-to-day activities, like finding a restaurant.

Einstein's postulates regarding relativity challenged much of the way traditional science had viewed certain physical aspects of the universe. Put simply, he stated that the laws of physics are the same for all observers, regardless of their speed, and that the speed of light was constant for all observers, regardless of their speed. For example, if a person traveling 60 miles per hour on a bus throws an object at 30 miles an hour, this object will appear to be moving at 90 miles per hour—both speeds combined—to a person standing still on the ground, but only 30 miles per hour to the person on the bus. However, if the person on the bus shoots a light beam, and a person standing still on the ground also sees it, the speed of the light will be the same for both people on the ground and people on the bus—186,000 miles per second. The extra 60 miles per hour of velocity from the bus means nothing.

Initial intuition tells us this does not make sense—speed is determined by distance over time. So, if the speed of light doesn't change, that means distance and time must change to always reach the correct number. Therefore, one of relativity's most extraordinary consequences is realized: time itself is relative! Things that we thought were fixed, constant, and known were not really any of those. Time (and length) were dependent on your viewpoint, and the circumstances (i.e. inertial reference frame) in which you viewed these "constants" affected the properties which you measured. Time is often agreed upon as the only constant thing in our universe. Einstein dared to say that we must now re-interpret how we view the world around us" [1]. What a guy!

[1] Arora, H., Einstein's Theory of Relativity: Implications beyond science?

Chapter II

Introduction

The Bistromatic Drive is a wonderful new method of crossing vast interstellar distances without all that dangerous mucking about with Improbability Factors.

Bistromathics itself is simply a revolutionary new way of understanding the behaviour of numbers. Just as Einstein observed that time was not an absolute but depended on the observer's movement in space, and that space was not an absolute, but depended on the observer's movement in time, it is now realized that numbers are not absolute, but depend on the observer's movement in restaurants.

The first non-absolute number is the number of people for whom the table is reserved. This will vary during the course of the first three telephone calls to the restaurant, and then bear no apparent relation to the number of people who actually turn up, or to the number of people who subsequently join them after the show/match/party/gig, or to the number of people who leave when they see who else has turned up.

The second non-absolute number is the given time of arrival, which is now known to be one of those most bizarre of mathematical concepts, a recipriversexcluson, a number whose existence can only be defined as being anything other than itself. In other words, the given time of arrival is the one moment of time at which it is impossible that any member of the party will arrive. Recipriversexclusons now play a vital part in many branches of maths, including statistics and accountancy and also form the basic equations used to engineer the Somebody Else's Problem field.

The third and most mysterious piece of non-absoluteness of all lies in the relationship between the number of items on the bill, the cost of each item, the number of people at the table, and what they are each prepared to pay for. (The number of people who have actually made any money in this field is only a sub-phenomenon.)

Chapter III

Goals

The goal of the project is to write a program able to display the result of the evaluation of an arithmetic expression composed of numbers with infinite size expressed in any base, if GNU's `bc` can handle the size, your program should too.

Chapter IV

General Instructions

- This project will be graded only by Moulinette.
- A Makefile must be used to compile this project.
- The executable file must be named `calc` and be located in the root repository.
- All the programs must be written in C.
- You will have to submit a file called author in the root of your repository containing your usernames followed by a newline.

```
$>cat author
login_1:login_2
$>
```

- Your project must comply with the Norm.
- You have to handle errors carefully. In no way can your program quit in an unexpected manner (Segmentation fault, bus error, double free, etc).
- You can only use these functions: `read`, `write`, `malloc`, `free`.
- And as always, this PDF could change up until one hour before deadline.

Chapter V

Mandatory part

This program must handle the operators "+-*/%", and the parenthesis '(' ')'.

- It must handle operator priority.
- It must identify syntax errors.
- It must read from stdin.
- Your root repository must be named `bistromatic`

Usage : `./calc base input_size`.

Examples :

```
$>echo  | ./calc
$>echo "3+6" | ./calc 0123456789 3 ; echo
9
$>echo "--++-6(12)" | ./calc 0123456789 10 ; echo
syntax error
$>echo "--++-6*12" | ./calc 0123456789 9 | cat -e ; echo
-72
$>echo "-(12-(4*32))" | ./calc 0123456789 12 | cat -e ; echo
116
$>
$>echo "-(12-(4*32)"  | ./calc 0123456789 11 | cat -e ; echo
syntax error
$>
$>echo "-( @-(;*\!@))"  | ./calc "~^@\!;i &[]" 13 | cat -e ; echo
^^
$>echo "-(12*(13+15/5*(6/(12+14%(30%5+(10*25)-46)+16)-20)/43)*20)*(-(12-98*42)*(16+63-50/3))"  | ./calc
    "0123456789" 84 | cat -e ; echo
-744629760
$>
```

`Parenthesis does not represent multiplication`

Chapter VI

Turn-in

Turn your work in using your `GiT` repository, as usual. Only work present on your repository will be graded.

`This project will be graded only by the Mother of Dragons, so do not forget to follow the directory structure exactly.`