

Project - 2

In this project, LL Parser is build using the “RUST” which helps in generating the parse tree.

Firstly the “Rust” platform is downloaded in “Ubuntu” and the “VS Code”.

```
nagas@DESKTOP-4Q4GSKN:~$ curl --proto 'https' --tlsv1.2 https://sh.rustup.rs -sSf | sh
info: downloading installer

Welcome to Rust!

This will download and install the official compiler for the Rust
programming language, and its package manager, Cargo.

Rustup metadata and toolchains will be installed into the Rustup
home directory, located at:

    /home/nagas/.rustup

This can be modified with the RUSTUP_HOME environment variable.

The Cargo home directory is located at:

    /home/nagas/.cargo

This can be modified with the CARGO_HOME environment variable.

The cargo, rustc, rustup and other commands will be added to
Cargo's bin directory, located at:

    /home/nagas/.cargo/bin

This path will then be added to your PATH environment variable by
modifying the profile files located at:

    /home/nagas/.profile
    /home/nagas/.bashrc

You can uninstall at any time with rustup self uninstall and
these changes will be reverted.

Current installation options:

    default host triple: x86_64-unknown-linux-gnu
    default toolchain:   stable (default)
    profile:             default
    modify PATH variable: yes

1) Proceed with standard installation (default - just press enter)
2) Customize installation
3) Cancel installation
```

```
>
info: profile set to 'default'
info: default host triple is x86_64-unknown-linux-gnu
info: syncing channel updates for 'stable-x86_64-unknown-linux-gnu'
info: latest update on 2025-03-18, rust version 1.85.1 (4eb161250 2025-03-15)
info: downloading component 'cargo'
info: downloading component 'clippy'
info: downloading component 'rust-docs'
info: downloading component 'rust-std'
info: downloading component 'rustc'
info: downloading component 'rustfmt'
info: installing component 'cargo'
info: installing component 'clippy'
info: installing component 'rust-docs'
18.2 MiB / 18.2 MiB (100 %) 12.1 MiB/s in 1s
info: installing component 'rust-std'
29.2 MiB / 29.2 MiB (100 %) 19.8 MiB/s in 1s
info: installing component 'rustc'
69.5 MiB / 69.5 MiB (100 %) 19.7 MiB/s in 3s
info: installing component 'rustfmt'
info: default toolchain set to 'stable-x86_64-unknown-linux-gnu'

stable-x86_64-unknown-linux-gnu installed - rustc 1.85.1 (4eb161250 2025-03-15)

Rust is installed now. Great!

To get started you may need to restart your current shell.
This would reload your PATH environment variable to include
Cargo's bin directory ($HOME/.cargo/bin).

To configure your current shell, you need to source
the corresponding env file under $HOME/.cargo.

This is usually done by running one of the following (note the leading DOT):
. "$HOME/.cargo/env" # For sh/bash/zsh/ash/dash/pdksh
source "$HOME/.cargo/env.fish" # For fish
source "$HOME/.cargo/env.nu" # For nushell
nagas@DESKTOP-4Q4GSKN:~$ rustc --version
Command 'rustc' not found, but can be installed with:
sudo snap install rustup # version 1.27.1, or
sudo apt install rustc # version 1.75.0+dfsg0ubuntu1-0ubuntu7.1
sudo apt install rustup # version 1.26.0-3
See 'snap info rustup' for additional versions.
nagas@DESKTOP-4Q4GSKN:~$ sudo snap install rustup
```

In “VS Code”, Rust is downloaded as extentions.
The “Rust” and “Cargo” versions are downloaded.
Then a new dictionary named “sanjana” is created in ubuntu and it is opened and a new file in named “main.rs” is created.

```
nagas@DESKTOP-4Q4GSKN:~$ source "$HOME/.cargo/env"
nagas@DESKTOP-4Q4GSKN:~$ rustc --version
rustc 1.85.1 (4eb161250 2025-03-15)
nagas@DESKTOP-4Q4GSKN:~$ cargo --version
cargo 1.85.1 (d73d2caf9 2024-12-31)
nagas@DESKTOP-4Q4GSKN:~$ nano src/main.rs
nagas@DESKTOP-4Q4GSKN:~$ cargo new sanjana
   Creating binary (application) `sanjana` package
note: see more `Cargo.toml` keys and their definitions at https://doc.rust-lang.org/cargo/reference/manifest.html
nagas@DESKTOP-4Q4GSKN:~$ cd sanjana
```

The code is saved in the VS Code and run in the ubuntu using the functions “cargo build” and “cargo run”. And then in the output it asks to enter the input, after entering the input the output is given as related to the input.

```
nagas@DESKTOP-4Q4GSKN:~/sanjana$ cargo build
   Compiling sanjana v0.1.0 (/home/nagas/sanjana)
   Finished `dev` profile [unoptimized + debuginfo] target(s) in 0.25s
nagas@DESKTOP-4Q4GSKN:~/sanjana$ cargo run
   Finished `dev` profile [unoptimized + debuginfo] target(s) in 0.00s
   Running `target/debug/sanjana`
Enter an arithmetic expression:
(10 + 5) * 3 - 7
Sub(
  Mul(
    Add(
      Int 10,
      Int 5
    ),
    Int 3
  ),
  Int 7
)
nagas@DESKTOP-4Q4GSKN:~/sanjana$ cargo build
   Finished `dev` profile [unoptimized + debuginfo] target(s) in 0.00s
nagas@DESKTOP-4Q4GSKN:~/sanjana$ cargo run
   Finished `dev` profile [unoptimized + debuginfo] target(s) in 0.00s
   Running `target/debug/sanjana`
Enter an arithmetic expression:
(6 + 2) * (5 - 3)
Mul(
  Add(
    Int 6,
    Int 2
  ),
  Sub(
    Int 5,
    Int 3
  )
)
nagas@DESKTOP-4Q4GSKN:~/sanjana$ cargo build
   Finished `dev` profile [unoptimized + debuginfo] target(s) in 0.00s
nagas@DESKTOP-4Q4GSKN:~/sanjana$ cargo run
   Finished `dev` profile [unoptimized + debuginfo] target(s) in 0.00s
   Running `target/debug/sanjana`
Enter an arithmetic expression:
8 - (4 + 2) * 3
Sub(
  Int 8,
  Mul(
```

And I also tested my code using some other input testcases.

```
nagas@DESKTOP-4QHGSKN: x + v
    Int 6,
    Int 2,
  },
  Sub(
    Int 5,
    Int 3,
  )
)
nagas@DESKTOP-4QHGSKN:~/sanjana$ cargo build
  Finished 'dev' profile [unoptimized + debuginfo] target(s) in 0.00s
nagas@DESKTOP-4QHGSKN:~/sanjana$ cargo run
  Finished 'dev' profile [unoptimized + debuginfo] target(s) in 0.00s
  Running 'target/debug/sanjana'
Enter an arithmetic expression:
8 = (4 + 2) * 3
Sub(
  Int 8,
  Mul(
    Add(
      Int 4,
      Int 2
    ),
    Int 3
  )
)
nagas@DESKTOP-4QHGSKN:~/sanjana$ cargo build
  Finished 'dev' profile [unoptimized + debuginfo] target(s) in 0.00s
nagas@DESKTOP-4QHGSKN:~/sanjana$ cargo run
  Finished 'dev' profile [unoptimized + debuginfo] target(s) in 0.00s
  Running 'target/debug/sanjana'
Enter an arithmetic expression:
(7 - 2) * (4 + 3) - 1
Sub(
  Mul(
    Sub(
      Int 7,
      Int 2
    ),
    Add(
      Int 4,
      Int 3
    )
  ),
  Int 1
)
nagas@DESKTOP-4QHGSKN:~/sanjana$ |
```