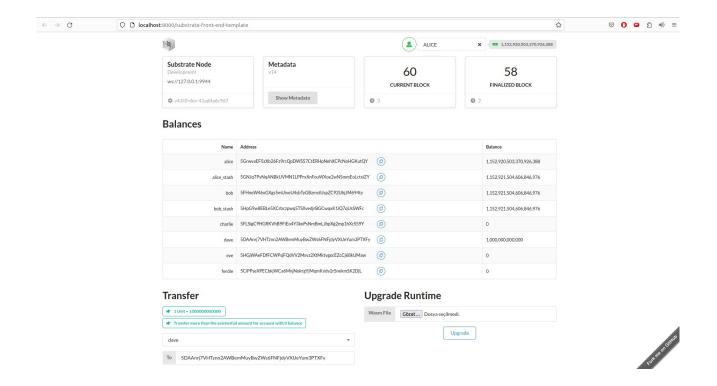# Final Project

The following three screenshots are captures from the initial assignment of the final project, which involves building a blockchain.
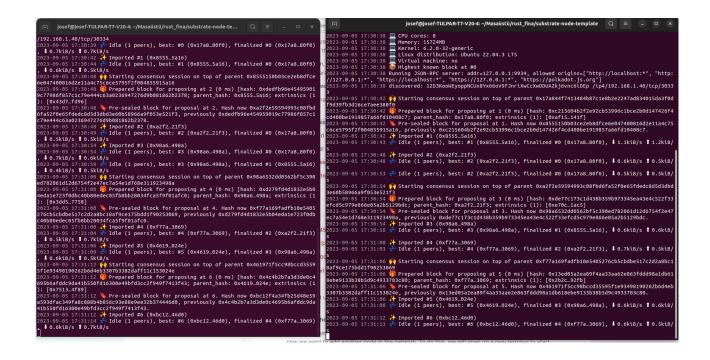
```
Finished release [optimized] target(s) in 1.29s
josef@josef-TULPAR-T7-V20-4:~/Masaüstü/rust_fina/substrate-node-template$ ./target/release/node-template --dev
2023-09-05 17:20:51 Substrate Node
2023-09-05 17:20:51 ✌️  version 4.0.0-dev-41ad4a6c9d7
2023-09-05 17:20:51 ❤️  by Substrate DevHub <https://github.com/substrate-developer-hub>, 2017-2023
2023-09-05 17:20:51 📋 Chain specification: Development
2023-09-05 17:20:51 🏷  Node name: obsolete-sister-9933
2023-09-05 17:20:51 👤 Role: AUTHORITY
2023-09-05 17:20:51 💾 Database: RocksDb at /tmp/substratePoL4ne/chains/dev/db/full
2023-09-05 17:20:51 🔨 Initializing Genesis block/state (state: 0x19ba…b406, header-hash: 0x9543…b3ae)
2023-09-05 17:20:51 👴 Loading GRANDPA authority set from genesis on what appears to be first startup.
2023-09-05 17:20:51 Using default protocol ID "sup" because none is configured in the chain specs
2023-09-05 17:20:51 🏷  Local node identity is: 12D3KooWFaNWDPENiqu7YRRcnP7mhPeZYGAywEgWCJyxQikwVv9j
2023-09-05 17:20:51 💻 Operating system: linux
2023-09-05 17:20:51 💻 CPU architecture: x86_64
2023-09-05 17:20:51 💻 Target environment: gnu
2023-09-05 17:20:51 💻 CPU: 11th Gen Intel(R) Core(TM) i7-11800H @ 2.30GHz
2023-09-05 17:20:51 💻 CPU cores: 8
2023-09-05 17:20:51 💻 Memory: 15724MB
2023-09-05 17:20:51 💻 Kernel: 6.2.0-32-generic
2023-09-05 17:20:51 💻 Linux distribution: Ubuntu 22.04.3 LTS
2023-09-05 17:20:51 💻 Virtual machine: no
2023-09-05 17:20:51 📦 Highest known block at #0
2023-09-05 17:20:51 Running JSON-RPC server: addr=127.0.0.1:9944, allowed origins=["*"]
2023-09-05 17:20:51 〽  Prometheus exporter started at 127.0.0.1:9615
2023-09-05 17:20:54 🙌 Starting consensus session on top of parent 0x9543c238a1044cd069fba6621b4eae2dce7f1a32d175d072d5
389266ad91b3ae
2023-09-05 17:20:54 🎁 Prepared block for proposing at 1 (1 ms) [hash: 0xb042fd6a9a03b7e5e615337ab763f38ecbbea599a2de8e
562b449d6231a94072; parent_hash: 0x9543…b3ae; extrinsics (1): [0x5340…f4c1]
2023-09-05 17:20:54 🔖 Pre-sealed block for proposal at 1. Hash now 0x8c9cd98bfe190479393f14fe602fc0d896848226428f5561c
4eb7b2ea5d61a58, previously 0xb042fd6a9a03b7e5e615337ab763f38ecbbea599a2de8e562b449d6231a94072.
```

```
Compiled successfully!

You can now view substrate-front-end-template in the browser.

  Local:            http://localhost:8000/substrate-front-end-template
  On Your Network:  http://192.168.1.40:8000/substrate-front-end-template

Note that the development build is not optimized.
To create a production build, use yarn build.

assets by path static/media/ 1.66 MiB
  assets by path static/media/*.svg 982 KiB 3 assets
  assets by path static/media/*.eot 230 KiB 3 assets
  assets by path static/media/*.ttf 230 KiB 3 assets
  assets by path static/media/*.woff 126 KiB 3 assets
  assets by path static/media/*.woff2 104 KiB
    asset static/media/brand-icons.278156e41e0ad908cf7f.woff2 53.2 KiB [emitted] [immutable] [from: node_modules/semantic-ui-css/themes/def
ault/assets/fonts/brand-icons.woff2) (auxiliary name: main)
    + 2 assets
  asset static/media/flags.99f63ae7a743f21ab308.png 27.5 KiB [emitted] [immutable] [from: node_modules/semantic-ui-css/themes/default/asset
s/images/flags.png) (auxiliary name: main)
asset static/js/bundle.js 8 MiB [emitted] (name: main) 1 related asset
asset index.html 2.27 KiB [emitted]
asset asset-manifest.json 2.1 KiB [emitted]
cached modules 6.64 MiB (javascript) 1.66 MiB (asset) 28.7 KiB (runtime) [cached] 2341 modules
webpack 5.76.1 compiled successfully in 1510 ms
```

The following screenshot is capture from the second assignment of the final project, which involves simulating a substrate network.

The following three screenshots are captures from the third assignment of the final project, which involves adding trusted nodes to a network.

2023-09-05 18:38:11 🖥 Target environment: gnu
2023-09-05 18:38:11 🖥 CPU: 11th Gen Intel(R) Core(TM) i7-11800H @ 2.30GHz
2023-09-05 18:38:11 🖥 CPU cores: 8
2023-09-05 18:38:11 🖥 Memory: 15724MB
2023-09-05 18:38:11 🖥 Kernel: 6.2.0-32-generic
2023-09-05 18:38:11 🖥 Linux distribution: Ubuntu 22.04.3 LTS
2023-09-05 18:38:11 🖥 Virtual machine: no
2023-09-05 18:38:11 🎯 Highest known block at #0
2023-09-05 18:38:11 Running JSON-RPC server: addr=127.0.0.1:9934, allowed origins=["http://localhost:*", "http://127.0.0.1:*", "https://localhost:*", "https://127.0.0.1:*", "https://polkadot.js.org"]
2023-09-05 18:38:11 💔 The bootnode you want to connect to at `/ip4/127.0.0.1/tcp/30333/p2p/12D3KooWLmrYDLoNTyTYtRdDyZLWDe1paxzxTw5RgjmHLfzW96SX` provided a different peer ID `12D3KooWCTQUtxonZDqrkqSq61UM9F3iSNxsdytSXLxf53TdFfhu` than the one you expect `12D3KooWLmrYDLoNTyTYtRdDyZLWDe1paxzxTw5RgjmHLfzW96SX`.
2023-09-05 18:38:11 discovered: 12D3KooWCTQUtxonZDqrkqSq61UM9F3iSNxsdytSXLxf53TdFfhu /ip4/192.168.1.40/tcp/30333
2023-09-05 18:38:16 💤 Idle (1 peers), best: #0 (0x0052…24e6), finalized #0 (0x0052…24e6), ⬇ 0.9kiB/s ⬆ 0.9kiB/s
^Cusername@josef-TULPAR-T7-V20-4:/home/josef/MasaüstÜ/rust_fina/substrate-node-template$ ./target/release/node-template   --base-path /tmp/node02   --chain ./customSpecRaw.json   --port 30334   --rpc-port 9934   --telemetry-url 'wss://telemetry.polkadot.io/submit/ 0'   --validator   --rpc-methods Unsafe   --name MyNode02   --bootnodes /ip4/127.0.0.1/tcp/30333/p2p/12D3KooWCTQUtxonZDqrkqSq61UM9F3iSNxsdytSXLxf53TdFfhu   --password-interactive
error: invalid value '/ip4/127.0.0.1/tcp/30333/p2p/1/12D3KooWCTQUtxonZDqrkqSq61UM9F3iSNxsdytSXLxf53TdFfhu' for '--bootnodes <ADDR>...': failed to parse: unexpected end of file

For more information, try '--help'.
username@josef-TULPAR-T7-V20-4:/home/josef/MasaüstÜ/rust_fina/substrate-node-template$ ./target/release/node-temusuusususuuuuuuuuuuuusername@josef-TULPAR-T7-V20-4:/home/josef/MasaüstÜ/rust_fina/substrate-node-template$ ./target/release/node-template   --base-path /tmp/node02   --chain ./customSpecRaw.json   --port 30334   --rpc-port 9934   --telemetry-url 'wss://telemetry.polkadot.io/submit/ 0'   --validator   --rpc-methods Unsafe   --name MyNode02   --bootnodes /ip4/127.0.0.1/tcp/30333/p2p/12D3KooWCTQUtxonZDqrkqSq61UM9F3iSNxsdytSXLxf53TdFfhu   --password-interactive
Keystore password:
2023-09-05 18:40:29 Substrate Node
2023-09-05 18:40:29 ✌ version 4.0.0-dev-41ad4a6c9d7
2023-09-05 18:40:29 ❤ by Substrate DevHub <https://github.com/substrate-developer-hub>, 2017-2023
2023-09-05 18:40:29 📋 Chain specification: My Local Custom Testnet
2023-09-05 18:40:29 🏷 Node name: MyNode02
2023-09-05 18:40:29 👤 Role: AUTHORITY
2023-09-05 18:40:29 💾 Database: RocksDb at /tmp/node02/chains/local_testnet/db/full
2023-09-05 18:40:29 Using default protocol ID "sup" because none is configured in the chain specs
2023-09-05 18:40:29 🏷 Local node identity is: 12D3KooWKjENxi3aQqFGL9SvYq2ubRkjPHkvXYTUUCWJjmQ1RPPP
2023-09-05 18:40:29 💻 Operating system: linux
2023-09-05 18:40:29 💻 CPU architecture: x86_64
2023-09-05 18:40:29 💻 Target environment: gnu
2023-09-05 18:40:29 💻 CPU: 11th Gen Intel(R) Core(TM) i7-11800H @ 2.30GHz
2023-09-05 18:40:29 💻 CPU cores: 8
2023-09-05 18:40:29 💻 Memory: 15724MB
2023-09-05 18:40:29 💻 Kernel: 6.2.0-32-generic
2023-09-05 18:40:29 💻 Linux distribution: Ubuntu 22.04.3 LTS
2023-09-05 18:40:29 💻 Virtual machine: no
2023-09-05 18:40:29 🎯 Highest known block at #0
2023-09-05 18:40:29 Running JSON-RPC server: addr=127.0.0.1:9934, allowed origins=["http://localhost:*", "http://127.0.0.1:*", "https://localhost:*", "https://127.0.0.1:*", "https://polkadot.js.org"]
2023-09-05 18:40:29 discovered: 12D3KooWCTQUtxonZDqrkqSq61UM9F3iSNxsdytSXLxf53TdFfhu /ip4/192.168.1.40/tcp/30333
2023-09-05 18:40:34 💤 Idle (1 peers), best: #0 (0x0052…24e6), finalized #0 (0x0052…24e6), ⬇ 1.2kiB/s ⬆ 1.3kiB/s
2023-09-05 18:40:39 💤 Idle (1 peers), best: #0 (0x0052…24e6), finalized #0 (0x0052…24e6), ⬇ 0.5kiB/s ⬆ 0.5kiB/s
2023-09-05 18:40:44 💤 Idle (1 peers), best: #0 (0x0052…24e6), finalized #0 (0x0052…24e6), ⬇ 0.5kiB/s ⬆ 0.5kiB/s
2023-09-05 18:40:49 💤 Idle (1 peers), best: #0 (0x0052…24e6), finalized #0 (0x0052…24e6), ⬇ 0.5kiB/s ⬆ 0.5kiB/s
2023-09-05 18:40:49 ✗ Error while dialing /dns/telemetry.polkadot.io/tcp/443/x-parity-wss/%2Fsubmit%2F: Custom { kind: Other, error: Timeout }
2023-09-05 18:40:54 💤 Idle (1 peers), best: #0 (0x0052…24e6), finalized #0 (0x0052…24e6), ⬇ 0.5kiB/s ⬆ 0.5kiB/s
2023-09-05 18:40:59 💤 Idle (1 peers), best: #0 (0x0052…24e6), finalized #0 (0x0052…24e6), ⬇ 0.4kiB/s ⬆ 0.5kiB/s
2023-09-05 18:41:04 💤 Idle (1 peers), best: #0 (0x0052…24e6), finalized #0 (0x0052…24e6), ⬇ 0.5kiB/s ⬆ 0.4kiB/s

The last screenshot is from 8th assignment of the project, whic involves smart contracts.

josef@josef-TULPAR-T7-V20-4: ~

josef@josef-TULPAR-T7-V20-4:~$ substrate-contracts-node --log info,runtime::contracts=debug 2>&1
2023-09-05 19:53:07.008 INFO main sc_cli::runner: Substrate Contracts Node
2023-09-05 19:53:07.008 INFO main sc_cli::runner: ✌ version 0.31.0-c8863fe08b7
2023-09-05 19:53:07.008 INFO main sc_cli::runner: ❤ by Parity Technologies <admin@parity.io>, 2021-2023
2023-09-05 19:53:07.008 INFO main sc_cli::runner: 📋 Chain specification: Development
2023-09-05 19:53:07.008 INFO main sc_cli::runner: 🏷 Node name: obeisant-spoon-8863
2023-09-05 19:53:07.008 INFO main sc_cli::runner: 👤 Role: AUTHORITY
2023-09-05 19:53:07.008 INFO main sc_cli::runner: 💾 Database: ParityDb at /tmp/substrate18k7ot/chains/dev/paritydb/full
2023-09-05 19:53:07.366 INFO main sc_service::client::client: 🔨 Initializing Genesis block/state (state: 0x089a…410d, header-hash: 0x152d…60f6)
2023-09-05 19:53:07.367 INFO main sub-libp2p: 🏷 Local node identity is: 12D3KooWGLhyVWt4TFk5UfPdQNGgioW24hp741DrCFjNyoxLhve6
2023-09-05 19:53:07.692 INFO main sc_sysinfo: 💻 Operating system: linux
2023-09-05 19:53:07.692 INFO main sc_sysinfo: 💻 CPU architecture: x86_64
2023-09-05 19:53:07.692 INFO main sc_sysinfo: 💻 Target environment: gnu
2023-09-05 19:53:07.692 INFO main sc_sysinfo: 💻 CPU: 11th Gen Intel(R) Core(TM) i7-11800H @ 2.30GHz
2023-09-05 19:53:07.692 INFO main sc_sysinfo: 💻 CPU cores: 8
2023-09-05 19:53:07.692 INFO main sc_sysinfo: 💻 Memory: 15724MB
2023-09-05 19:53:07.692 INFO main sc_sysinfo: 💻 Kernel: 6.2.0-32-generic
2023-09-05 19:53:07.692 INFO main sc_sysinfo: 💻 Linux distribution: Ubuntu 22.04.3 LTS
2023-09-05 19:53:07.692 INFO main sc_sysinfo: 💻 Virtual machine: no
2023-09-05 19:53:07.692 INFO main sc_service::builder: 🎯 Highest known block at #0
2023-09-05 19:53:07.692 INFO main sc_rpc_server: Running JSON-RPC server: addr=127.0.0.1:9944, allowed origins=["*"]
2023-09-05 19:53:07.692 INFO tokio-runtime-worker substrate_prometheus_endpoint: 🔦 Prometheus exporter started at 127.0.0.1:9615
2023-09-05 19:53:12.693 INFO tokio-runtime-worker substrate: 💤 Idle (0 peers), best: #0 (0x152d…60f6), finalized #0 (0x152d…60f6), ⬇ 0 ⬆ 0
2023-09-05 19:53:17.694 INFO tokio-runtime-worker substrate: 💤 Idle (0 peers), best: #0 (0x152d…60f6), finalized #0 (0x152d…60f6), ⬇ 0 ⬆ 0
2023-09-05 19:53:17.696 INFO tokio-runtime-worker jsonrpsee_server::server: Accepting new connection 1/100
2023-09-05 19:53:17.697 INFO tokio-runtime-worker jsonrpsee_server::server: Accepting new connection 2/100
2023-09-05 19:53:22.694 INFO tokio-runtime-worker substrate: 💤 Idle (0 peers), best: #0 (0x152d…60f6), finalized #0 (0x152d…60f6), ⬇ 0 ⬆ 0
2023-09-05 19:53:27.694 INFO tokio-runtime-worker substrate: 💤 Idle (0 peers), best: #0 (0x152d…60f6)

josef@josef-TULPAR-T7-V20-4: ~/MasaüstÜ/rust_fina/smart_Contracts/fl...

        dispatch_info: DispatchInfo { weight: Weight { ref_time: 3602408904, proof_size: 9095 }, class: Normal, pays_fee: Yes }
josef@josef-TULPAR-T7-V20-4:~/MasaüstÜ/rust_fina/smart_Contracts/flipper$ cargo contract call --contract $INSTANTIATED_CONTRACT_ADDRESS --message get --suri //Alice --dry-run
error: The argument '--contract <contract>' requires a value but none was supplied

For more information try '--help'
josef@josef-TULPAR-T7-V20-4:~/MasaüstÜ/rust_fina/smart_Contracts/flipper$ cargo contract call --contract 5GH2FgAQqivmMae7rCku82z9Up4XbF6o3jHdfDCwGyD4b65B --message get --suri //Alice --dry-run
       Result Success!
     Reverted false
        Data Tuple(Tuple { ident: Some("Ok"), values: [Bool(false)] })
josef@josef-TULPAR-T7-V20-4:~/MasaüstÜ/rust_fina/smart_Contracts/flipper$ cargo contract call --contract 5GH2FgAQqivmMae7rCku82z9Up4XbF6o3jHdfDCwGyD4b65B --message flip --suri //Alice
 Dry-running flip (skip with --skip-dry-run)
    Success! Gas required estimated at Weight(ref_time: 820353896, proof_size: 29459)
Confirm transaction details: (skip with --skip-confirm)
     Message flip
        Args
 Gas limit Weight(ref_time: 820353896, proof_size: 29459)
Submit? (Y/n): y
      Events
       Event Balances ➜ Withdraw
        who: 5GrwvaEF5zXb26Fz9rcQpDWS7CtERHpNehXCPcNoHGKutQY
        amount: 124.414154µUNIT
       Event Contracts ➜ Called
        caller: Signed(5GrwvaEF5zXb26Fz9rcQpDWS7CtERHpNehXCPcNoHGKutQY)
        contract: 5GH2FgAQqivmMae7rCku82z9Up4XbF6o3jHdfDCwGyD4b65B
       Event TransactionPayment ➜ TransactionFeePaid
        who: 5GrwvaEF5zXb26Fz9rcQpDWS7CtERHpNehXCPcNoHGKutQY
        actual_fee: 124.414154µUNIT
        tip: 0UNIT
       Event System ➜ ExtrinsicSuccess
        dispatch_info: DispatchInfo { weight: Weight { ref_time: 1762010896, proof_size: 19881 }, class: Normal, pays_fee: Yes }
josef@josef-TULPAR-T7-V20-4:~/MasaüstÜ/rust_fina/smart_Contracts/flipper$