fsm-lite-report

2025-07-22

Programa original

Arquivo original/fsm-lite.cpp

```
#include "default.h"
#include "configuration.h"
#include "input_reader.h"
#include <sdsl/suffix_trees.hpp> // TODO: replace with csa+lcp array
#include <sdsl/wt_algorithm.hpp>
#include <iostream>
#include <vector>
#include <cstdlib> // std::exit()
using namespace std;

typedef sdsl::cst_sct3<> cst_t;
typedef sdsl::wt_int<> wt_t;
typedef sdsl::bit_vector bitv_t;
typedef cst_t::char_type char_type;
typedef cst_t::node_type node_type;
typedef wt_t::size_type size_type;

/**
 * Construct the sequence labels
 *
 * Assumes that the number of input files is less than 2^DBITS.
 * The value of DBITS has to be set at compile time (in defaults.h).
 * Large DBITS values result in large memory requirements for wt_init().
 */
void wt_init(wt_t &wt, bitv_t &separator, cst_t &cst, input_reader *ir, configuration &config)
{
    uint64_t n = cst.csa.size();
    sdsl::int_vector<DBITS> labels(n, ~0u);
    separator = bitv_t(n, 0);
    uint64_t k = ir->size()-1;
    uint64_t j = cst.csa.wavelet_tree.select(1, 0);
    if (config.debug)
        cerr << "bwt end marker pos = " << j << endl;
    uint64_t bwtendpos = j;
    j = cst.csa.lf[j];
    labels[j] = 0;  // Label of last byte
    separator[n-1] = 0;
    separator[n-2] = 1;
    j = cst.csa.lf[j];
```

```
    for (uint64_t i = n-2; i > 0; i--) {
        char_type c = cst.csa.bwt[j];
        labels[j] = k;
        if (c == '$')
            k --;
        if (c == '$' || c == '#')
            separator[i-1] = 1;

        j = cst.csa.lf[j];
    }
    labels[j] = k;
    if (j != bwtendpos || k != 0) // Assert
    {
        cerr << "Labeling failed, j = " << j << ", k = " << k << endl;
        exit(1);
    }

    //TODO cleanup
    /*for (uint64_t i = 0; i < n; ++i)
        cerr << cst.csa.text[i];
    cerr << endl;
    for (uint64_t i = 0; i < n; ++i)
        cerr << separator[i];
    cerr << endl;
    for (uint64_t i = 0; i < n; ++i)
        cerr << labels[cst.csa.isa[i]];
    cerr << endl;
    */

    std::string tmp_file = sdsl::ram_file_name(sdsl::util::to_string(sdsl::util::pid())+"_"+sdsl::util:
    sdsl::store_to_file(labels, tmp_file);
    sdsl::int_vector_buffer<DBITS> text_buf(tmp_file);
    wt = wt_t(text_buf, labels.size());
    if (config.debug)
        cerr << "wt size = " << wt.size() << ", n = " << n << endl;
    j = 0;
    for (uint64_t i = 0; i < ir->size(); ++i)
        j += wt.rank(n, i);
    if (j != n) // Assert
    {
        cerr << "Label sum failed, j = " << j << ", n = " << n << endl;
        exit(1);
    }

}

int main(int argc, char ** argv)
{
    configuration config(argc, argv);
    if (!config.good)
        config.print_short_usage();

    if (config.verbose)
```

```
        cerr << "Reading input files..." << endl;
    input_reader *ir = input_reader::build(config);
    if (config.verbose)
        cerr << "Read " << ir->size() << " input files and " << ir->total_seqs() << " sequences of total

    /**
     * Initialize the data structures
     */
    if (config.verbose)
        cerr << "Constructing the data structures..." << endl;
    cst_t cst;
    construct(cst, config.tmpfile + ".tmp", 1);
    if (!cst.csa.size())
    {
        cerr << "error: unable to construct the data structure; out of memory?" << endl;
        abort();
    }

    wt_t label_wt;
    bitv_t separator;
    wt_init(label_wt, separator, cst, ir, config);

    bitv_t::rank_1_type sep_rank1(&separator);
    //bitv_t::select_1_type sep_select1(&separator); TODO Remove?
    assert(sep_rank1(cst.size()) == ir->total_seqs());

    size_type support = 0;
    vector<wt_t::value_type> labels(ir->size(), 0);
    vector<size_type> rank_sp(ir->size(), 0);
    vector<size_type> rank_ep(ir->size(), 0);

    if (config.verbose)
        cerr << "Construction complete, the main index requires " << size_in_mega_bytes(cst) << " MiB pl

    /**
     * Main loop
     */
    node_type root = cst.root();
    vector<node_type> buffer;
    buffer.reserve(1024*1024);
    for (auto& child: cst.children(root))
        buffer.push_back(child);
    while (!buffer.empty())
    {
        node_type const node = buffer.back();
        buffer.pop_back();
        unsigned depth = cst.depth(node);
        if (depth < config.maxlength)
            for (auto& child: cst.children(node))
                buffer.push_back(child);
        if (depth < config.minlength)
            continue;
        if (cst.is_leaf(node))
```

```
            continue;

        // Process the candidate node
        size_type sp = cst.lb(node);
        size_type ep = cst.rb(node);
        node_type wn = cst.wl(node, cst.csa.bwt[sp]);
        /*if (config.debug)
        {
            size_type pos = cst.csa[sp];
            auto s = extract(cst.csa, pos, pos + depth - 1);
            cerr << "at node = " << depth << "-[" << sp << "," << ep << "], wl = " << (wn != root);
            if (wn!=root)
                cerr << "[" << cst.rb(wn)-cst.lb(wn) << " vs " << ep-sp << "]";
            cerr << ", seq = " << s << endl;
            }*/
        if (wn == root && config.debug)
        {
            cerr << "warning: no Weiner-link at " << depth << "-[" << sp << "," << ep << "]" << endl;
            continue;
        }
        if (depth < config.maxlength && cst.rb(wn)-cst.lb(wn) == ep-sp)
            continue; // not left-branching

        sdsl::interval_symbols(label_wt, sp, ep+1, support, labels, rank_sp, rank_ep);
        if (support < config.minsupport || support > config.maxsupport)
            continue;

        size_type truesupp = 0;
        for (size_type i = 0; i < support; ++i)
            if (config.minfreq <= rank_ep[i]-rank_sp[i])
                ++truesupp;
        if (truesupp < config.minsupport)
            continue;

        if (depth > config.maxlength)
            depth = config.maxlength;
        size_type pos = cst.csa[sp];
        // Check for separator symbol TODO cleanup
        /*unsigned p_depth = cst.depth(cst.parent(node));
        if (sep_rank1(pos) != sep_rank1(pos + p_depth))
            continue; // Separator occurs above parent node
        if (sep_rank1(pos) != sep_rank1(pos + depth))
            depth = sep_select1(sep_rank1(pos)+1) - pos +1; // Separator above current node
        */

        if (sep_rank1(pos) != sep_rank1(pos + depth))
            continue;
        auto s = extract(cst.csa, pos, pos + depth - 1);
        if (input_reader::smaller_than_rev_cmpl(s))
            continue;
        cout << s + " |";
        for (size_type i = 0; i < support; ++i)
            if (config.minfreq <= rank_ep[i]-rank_sp[i])
```

```
                cout << ' ' << ir->id(labels[i]) << ':' << rank_ep[i]-rank_sp[i];
        cout << '\n';
    }

    if (config.verbose)
        cerr << "All done." << endl;
    delete ir; ir = 0;
    return 0;
}
```

Arquivo original/Makefile

```
SDSL_INSTALL_PREFIX=${HOME}/software

CPPFLAGS=-std=c++11 -I$(SDSL_INSTALL_PREFIX)/include -DNDEBUG -O3 -msse4.2
LIBS=-lsdsl -ldivsufsort -ldivsufsort64
OBJ = configuration.o input_reader.o fsm-lite.o

fsm-lite: $(OBJ)
    $(LINK.cpp) $^ -L$(SDSL_INSTALL_PREFIX)/lib $(LIBS) -o $@

test: fsm-lite
    ./fsm-lite -l test.list -t tmp -v --debug -m 1

clean:
    $(RM) fsm-lite *.o *~

depend:
    g++ -MM -std=c++11 -I$(SDSL_INSTALL_PREFIX)/include *.cpp > dependencies.mk

include dependencies.mk
```

Versao 2.0

- Ter lista de arquivos e permiss'ao de leitura dos mesmos
- Instalado sdsl-lite v2.0.3 na home e atualizado Makefile

https://github.com/simongog/sdsl-lite/releases/tag/v2.0.3

```
$ cd sdsl-lite-2.0.3/
$ ./install.sh
$ cd
$ cd LACTAS-HELISSON-01/Helena-stuff/fsm-lite/v2-0/
```

Devido a um serie de erros de compilacao foi necessario fazer o seguinte - Modificar o makefile

```
SDSL_INSTALL_PREFIX=${HOME}/sdsl-lite-2.0.3
DIVSUFSORT_INCLUDE=$(SDSL_INSTALL_PREFIX)/build/external/libdivsufsort-2.0.1/include

CPPFLAGS=-std=c++11 -I$(SDSL_INSTALL_PREFIX)/include -I$(DIVSUFSORT_INCLUDE) -DNDEBUG -O3 -msse4.2
```

```
LIBS=-lsdsl -ldivsufsort -ldivsufsort64
OBJ = configuration.o input_reader.o fsm-lite.o

fsm-lite: $(OBJ)
    $(LINK.cpp) $^ -L$(SDSL_INSTALL_PREFIX)/lib $(LIBS) -o $@

test: fsm-lite
    ./fsm-lite -l test.list -t tmp -v --debug -m 1

clean:
    $(RM) fsm-lite *.o *~

depend:
    g++ -MM -std=c++11 $(CPPFLAGS) -I$(SDSL_INSTALL_PREFIX)/include *.cpp > dependencies.mk

include dependencies.mk
```

- Executar no terminal

```
$ cd ~/sdsl-lite-2.0.3
$ mkdir -p build
helena.despindula@BIOINFO08:~/sdsl-lite-2.0.3$ cd build
helena.despindula@BIOINFO08:~/sdsl-lite-2.0.3/build$ cmake .. -DCMAKE_INSTALL_PREFIX=$HOME/sdsl-lite-2.0
-- Compiler is recent enough to support C++11.
-- Performing Test HAVE_GCC_STD=C__11__WALL__WEXTRA___DNDEBUG
-- Performing Test HAVE_GCC_STD=C__11__WALL__WEXTRA___DNDEBUG - Success
CMake Warning (dev) at external/gtest-1.6.0/CMakeLists.txt:42 (project):
  Policy CMP0048 is not set: project() command manages VERSION variables.
  Run "cmake --help-policy CMP0048" for policy details.  Use the cmake_policy
  command to set the policy and suppress this warning.

  The following variable(s) would be set to empty:

    PROJECT_VERSION
    PROJECT_VERSION_MAJOR
    PROJECT_VERSION_MINOR
    PROJECT_VERSION_PATCH
This warning is for project developers.  Use -Wno-dev to suppress it.

CMake Warning (dev) at external/libdivsufsort-2.0.1/CMakeLists.txt:19 (project):
  Policy CMP0048 is not set: project() command manages VERSION variables.
  Run "cmake --help-policy CMP0048" for policy details.  Use the cmake_policy
  command to set the policy and suppress this warning.

  The following variable(s) would be set to empty:

    PROJECT_VERSION
    PROJECT_VERSION_MAJOR
    PROJECT_VERSION_MINOR
    PROJECT_VERSION_PATCH
This warning is for project developers.  Use -Wno-dev to suppress it.

-- Configuring done
```

```
-- Generating done
-- Build files have been written to: /home/helena.despindula/sdsl-lite-2.0.3/build
helena.despindula@BIOINFO08:~/sdsl-lite-2.0.3/build$ make -j$(nproc)
[  4%] Built target gtest
[ 15%] Built target divsufsort64
[ 27%] Built target divsufsort
[ 95%] Built target sdsl
[100%] Built target gtest_main
helena.despindula@BIOINFO08:~/sdsl-lite-2.0.3/build$ make install
[  4%] Built target gtest
[  9%] Built target gtest_main
[ 20%] Built target divsufsort64
[ 31%] Built target divsufsort
[100%] Built target sdsl
Install the project...
-- Install configuration: "Release"
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/divsufsort.h
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/divsufsort64.h
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/lib/libdivsufsort.a
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/lib/libdivsufsort64.a
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/bit_vector_il.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/bit_vectors.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/bits.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/bp_support.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/bp_support_algorithm.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/bp_support_g.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/bp_support_gg.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/bp_support_sada.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/coder.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/coder_comma.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/coder_elias_delta.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/coder_elias_gamma.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/coder_fibonacci.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/config.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/construct.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/construct_bwt.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/construct_config.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/construct_isa.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/construct_lcp.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/construct_lcp_helper.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/construct_sa.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/construct_sa_se.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/csa_alphabet_strategy.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/csa_bitcompressed.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/csa_sada.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/csa_sampling_strategy.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/csa_wt.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/cst_iterators.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/cst_sada.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/cst_sct3.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/dac_vector.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/enc_vector.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/fast_cache.hpp
```

```
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/int_vector.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/int_vector_buffer.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/int_vector_io_wrappers.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/int_vector_mapper.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/inv_perm_support.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/io.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/iterators.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/k2_treap.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/k2_treap_algorithm.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/k2_treap_helper.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/lcp.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/lcp_bitcompressed.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/lcp_byte.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/lcp_dac.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/lcp_support_sada.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/lcp_support_tree.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/lcp_support_tree2.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/lcp_vlc.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/lcp_wt.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/louds_tree.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/memory_management.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/nearest_neighbour_dictionary.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/nn_dict_dynamic.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/qsufsort.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/ram_filebuf.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/ram_fs.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rank_support.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rank_support_scan.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rank_support_v.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rank_support_v5.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rmq_succinct_sada.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rmq_succinct_sct.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rmq_support.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rmq_support_sparse_table.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rrr_helper.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rrr_vector.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/rrr_vector_15.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/sd_vector.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/sdsl_concepts.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/select_support.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/select_support_mcl.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/select_support_scan.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/sfstream.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/sorted_int_stack.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/sorted_multi_stack_support.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/sorted_stack_support.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/structure_tree.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/suffix_array_algorithm.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/suffix_array_helper.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/suffix_arrays.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/suffix_tree_algorithm.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/suffix_tree_helper.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/suffix_trees.hpp
```

```
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/uint128_t.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/uint256_t.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/uintx_t.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/util.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/vectors.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/vlc_vector.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wavelet_trees.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wm_int.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wt_algorithm.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wt_blcd.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wt_gmr.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wt_helper.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wt_huff.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wt_hutu.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wt_int.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wt_pc.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/include/sdsl/wt_rlmn.hpp
-- Installing: /home/helena.despindula/sdsl-lite-2.0.3/lib/libsdsl.a
helena.despindula@BIOINFO08:~/sdsl-lite-2.0.3/build$ ls ~/sdsl-lite-2.0.3/lib/lib*.a
/home/helena.despindula/sdsl-lite-2.0.3/lib/libdivsufsort64.a  /home/helena.despindula/sdsl-lite-2.0.3/l
helena.despindula@BIOINFO08:~/sdsl-lite-2.0.3/build$ cd
helena.despindula@BIOINFO08:~$ cd LACTAS-HELISSON-01/Helena-stuff/fsm-lite/v2-0/
helena.despindula@BIOINFO08:~/LACTAS-HELISSON-01/Helena-stuff/fsm-lite/v2-0$ ls
configuration.cpp  default.h                execussao_padronizada_v2_0.sh  input_fsm-lite_OXA-23_OXA-24
configuration.h    dependencies.mk          fsm-lite.cpp                   input_fsm-lite_OXA-23_OXA-24
configuration.o    execussao_padronizada.sh fsm-lite.o                     input_reader.cpp
```

Dai foi possivel compilar corretamente

```
helena.despindula@BIOINFO08:~/LACTAS-HELISSON-01/Helena-stuff/fsm-lite/v2-0$ make clean
rm -f fsm-lite *.o *~
helena.despindula@BIOINFO08:~/LACTAS-HELISSON-01/Helena-stuff/fsm-lite/v2-0$ make depend && make
g++ -MM -std=c++11 -std=c++11 -I/home/helena.despindula/sdsl-lite-2.0.3/include -I/home/helena.despindul
g++  -std=c++11 -I/home/helena.despindula/sdsl-lite-2.0.3/include -I/home/helena.despindula/sdsl-lite-2
g++  -std=c++11 -I/home/helena.despindula/sdsl-lite-2.0.3/include -I/home/helena.despindula/sdsl-lite-2
g++  -std=c++11 -I/home/helena.despindula/sdsl-lite-2.0.3/include -I/home/helena.despindula/sdsl-lite-2
g++  -std=c++11 -I/home/helena.despindula/sdsl-lite-2.0.3/include -I/home/helena.despindula/sdsl-lite-2



$ ls
configuration.cpp  configuration.o  dependencies.mk          execussao_padronizada_v2_0.sh  fsm-lite.cp
configuration.h    default.h   fsm-lite                     fsm-lite.o    input_fsm-lite_OXA-23_OXA-24
```

- Criacao de arquivo .sh para execussao padronizada
- Criacao de controle de versao no github

Arquivo v2-0/execussao_padronizada_v2_0.sh

```
#!/bin/bash

INPUT_FILE=/input_fsm-lite_OXA-23_OXA-24_05.txt
```

```
TIMESTAMP=$(date '+%Y-%m-%d_%H-%M-%S')
LOG_DIR="logs/fsm-lite"
TMP_DIR="tmp/fsm-lite"
MONITOR_LOG="${LOG_DIR}/fsm_monitor_log_${TIMESTAMP}.txt"
OUTPUT_LOG="${LOG_DIR}/fsm_output_log_${TIMESTAMP}.txt"
TMP_FILES="${TMP_DIR}/fsm_tmp_files_${TIMESTAMP}"
OUTPUT_RES="fsm_results_${TIMESTAMP}.txt"
SESSION_RUN="fsm_run"
SESSION_MONITOR="fsm_monitor"
INTERVAL_MONITOR=30

# Criar pasta de logs, se não existir
mkdir -p "$LOG_DIR"
mkdir -p "$TMP_DIR"

# Criar log inicial de monitoramento
echo "Iniciando monitoramento do fsm-lite em $TIMESTAMP..." > "$MONITOR_LOG"
echo "Iniciando execução do fsm-lite em $TIMESTAMP..." > "$OUTPUT_LOG"
echo "Salvando saída em: $OUTPUT_RES"

# Criar sessão tmux para executar fsm-lite com stdout + stderr no mesmo log
tmux new-session -d -s "$SESSION_RUN" "bash -c '
  echo Iniciando fsm-lite...
  { time ./fsm-lite -l \"${INPUT_FILE}\" -s 6 -S 610 -v -t \"${TMP_FILES}\" ; } \
    > \"${OUTPUT_RES}\" \
    2> \"${OUTPUT_LOG}\"
'"

# Aguardar e capturar o PID do processo
sleep 3
FSM_PID=$(pgrep -f "./fsm-lite -l ${INPUT_FILE}")

if [ -z "$FSM_PID" ]; then
  echo "Erro: não foi possível identificar o PID de fsm-lite."
  exit 1
fi

# Comando do monitoramento
# Comando do monitoramento
MONITOR_CMD=$(cat << 'EOF'
# Escreve cabeçalho uma vez
echo -e "timestamp\tpid\tppid\tcpu_percent\tmem_percent\tvsz_kb\trss_kb\telapsed\tcmd" > "$MONITOR_LOG"

while kill -0 $FSM_PID 2>/dev/null; do
  ts="\$(date '+%Y-%m-%d %H:%M:%S')"
  ps -p \$FSM_PID -o pid=,ppid=,%cpu=,%mem=,vsz=,rss=,etime=,cmd= | while read pid ppid cpu mem vsz rss
    echo -e "\$ts\t\$pid\t\$ppid\t\$cpu\t\$mem\t\$vsz\t\$rss\t\$elapsed\t\$cmd"
  done >> "\$MONITOR_LOG"
  sleep \$INTERVAL_MONITOR
done

echo "Monitoramento encerrado em \$(date)" >> "\$MONITOR_LOG"
EOF
```

```
)


# Criar sessão de monitoramento
tmux new-session -d -s "$SESSION_MONITOR" "FSM_PID=$FSM_PID MONITOR_LOG=$MONITOR_LOG INTERVAL_MONITOR=$I

# Mensagem final
echo "Sessões tmux criadas:"
echo "- Execução:     tmux attach -t $SESSION_RUN"
echo "- Monitoramento: tmux attach -t $SESSION_MONITOR"
echo "Logs salvos em:"
echo "  - Monitoramento: $MONITOR_LOG"
echo "  - Saída + Erros do programa: $OUTPUT_LOG"
```

v2.1

time ./fsm-lite -l input_fsm-lite_OXA-23_OXA-24_010.txt -s 6 -S 610 -v -t temp

find /LACTAS-HELISSON-01/joyce.souza/Abaumannii/genomes/BVBRC/ncbi_dataset/data -type f -name "*.fna" > lista_fna.txt