Alexandria University- Faculty of Engineering

Computer and Systems Engineering Department

Phase 1 : Lexical Analyzer

Name	ID
Abdelrahman Elsayed Ahmed	19015893
Mohamed Mostafa Ibrahim	19016506
Engy Ibrahim Mahmoud	19015478
Esraa Hassan Mokhtar	19015407

a) A description of the used data structure:

- **For input Parser:**

  This code utilizes various data structures to facilitate the parsing of input files containing regular expressions, definitions, keywords, and punctuations. These data structures play crucial roles in managing tokens, symbols, NFAs (Non-deterministic Finite Automata), and operators within the lexical analysis process.

  1. **Stacks:**
     - **operatorsStack :** `stack<string>` : Manages string-based operators during parsing.
     - **operandsStack :** `stack<NFA>` : Stores NFAs as operands for operations during parsing.
  2. **Sets:**
     - **operators :** `const set<string>` : Holds the set of recognized operators.
  3. **Maps:**
     - **precedence :** `map<string, int>` : Stores operator precedence for parsing expressions.
     - **basicExps :** `map<string, NFA>` : Maps string identifiers to their corresponding NFAs (basic expressions).
     - **regDefs :** `map<string, string>` : Associates string identifiers with their regular expression definitions.
  4. **Vectors:**
     - **nfas :** `vector<NFA>` : Stores NFAs generated during parsing of regular expressions, definitions, keywords, and punctuations.

- **For NFA:**

The NFA class represents a Non-Deterministic Finite Automaton (NFA), a mathematical model used in computer science and theoretical computation to describe patterns using states and transitions. The class uses various data structures to define and manipulate NFAs:

1. **Maps:**
   - **stateTransitions :** `map<int, vector<pair<int, char>>>`: Stores transitions between states where the key is the state number, and the value is a vector of pairs representing transitions to other states with corresponding input symbols.
   - **epsilonTransitions:** `map<int, vector<int>>`: Stores epsilon transitions where the key is the state number, and the value is a vector of integers representing states reachable via epsilon transitions.
   - **statePriorities:** `map<int, int>`: Associates states with their priorities.
   - **priorityStrings:** `map<int, string>`: Associates state priorities with string representations.
2. **Sets:**
   - **alphabet:** `set<char>`: Stores unique input symbols in the NFA's alphabet.
3. **Variables:**
   - **startState, endState:** Represent the start and end states of the NFA, respectively.
   - **priority:** Represents the priority of the NFA final state.

- **For DFA:**

  The DFA class represents a Deterministic Finite Automaton (DFA). DFAs are fundamental in automata theory and computer science, used for lexical analysis in compilers, pattern matching, and various other applications. The class uses various data structures :

  1. **Maps:**

     - **dfaStates :** `map<int, set<int>>` :Maps state numbers in the DFA to sets of states representing subsets of the NFA states.
     - **Dfa :** `map<pair<int, char>, int>` : Represents transitions in the DFA.
     - **dfaFinalStates :** `map<int, int>` : Maps DFA states to their priorities

  2. **Sets:**
     - **alphabet :** `set<char>`: Holds the symbols that form the input alphabet of the DFA
     - **ids :** `set<string>`: Contains identifiers encountered during the DFA construction.

- **For input handler:**

  The code provided implements a token generator using various data structures and algorithms to recognize and categorize tokens within a given input file. Let's break down the key components of the data structures used:

  1. **Maps:**
     - **Priority** : `map<int, string>` : Associates priority numbers with corresponding strings, where 0 is mapped to keywords. This mapping is utilized to determine the type of token based on its priority.

  2. **Vectors:**
     - **splitTokens** : `vector<string>` **:** Stores the tokens obtained after splitting the input file content (**we split the input file by spaces**)
     - **tokens :** `vector<string>` **:** Accumulates recognized token types.
     - **values :** `vector<string>` **:** Holds the actual token values extracted from the input.
     - **errors :** `vector<string>` **:** Gathers any encountered errors during tokenization.

  3. **Sets:**
     - **ids :** `set<string>` **:** Contains unique identifiers encountered during tokenization.

4. **File I/O and String Operations:**

- **ifstream , ofstream :** for reading and writing files.
- **stringstream , string :** manipulation operations to handle file content and token extraction.
- Use of iterators (**istream_iterator**) to split the input file content into tokens.

b) Explanation of all algorithms and techniques used

- **For input parser:**

1. Preprocessing Functions:

- **preprocessKeywords** (`string line`) : Counts and processes keywords within a line.
- **preprocessPunctuations** (`string line`) : Counts and processes punctuations within a line.
- **preprocess()**: Handles preprocessing of lines from the input file, identifying keywords, punctuations, regular definitions, and regular expressions.

2. Regular Expression Processing:

- **tokenize** (`string regDef`) : Breaks a regular definition into tokens.
- **transformToCanonicalReg** (`vector<string> tokens`) : Transforms tokens into canonical regular expressions.
- **addConcatSymbol** (`vector<string> tokens`) : Inserts concatenation symbols in tokenized regular expressions.
- **buildNFA** (`vector<string> tokens`) : Constructs a Nondeterministic Finite Automaton (NFA) from tokenized regular expressions.
- **handleRegDef** (`string line, int equalIdx`) : Handles regular definitions.
- **handleRegEx** (`string line, int colonIdx`) : Handles regular expressions.

3. **NFA Manipulation:**

   - **nfaStep** `(stack<string> &operatorsStack, stack<NFA> &operandsStack)`: Handles operations on NFAs (concatenation, closure, union).

   - **NFA::concatenate, NFA::positiveClosure, NFA::kleeneClosure, NFA::Or:** Operations on NFAs (concatenation, positive closure, Kleene closure, union).

4. **File Parsing and overall processing:**

   - **parse()**: Parses the input file, constructs NFAs, handles keywords, punctuations, regular definitions, and regular expressions, and creates a combined NFA.

   - **getCombinedNFA()**: Returns the combined NFA constructed from the input file.

Explanation of Algorithms and Techniques used:

1. Tokenization and Regular Expression Transformation:

- Tokenization splits regular expressions into manageable units (tokens).
- Transforming tokens into canonical regular expressions involves ensuring proper formatting and handling of operators and symbols

2. Building NFA from Regular Expressions:

- Thompson's Construction Algorithm: Likely used to convert regular expressions into NFAs. Thompson's algorithm constructs NFAs directly from regular expressions.

3. Handling Operators:

- Concatenation (" "): Inserting a concatenation symbol to distinguish between implicit concatenation in regular expressions.
- Positive Closure ("+") and Kleene Closure ("*"): Representing one or more occurrences and zero or more occurrences, respectively.
- Union ("|"): Combining different NFAs based on the union of their languages.

4. NFA Manipulation:

- Stack-based Approach: Employing stacks to handle operations on NFAs while parsing expressions.
- NFA Operations: Concatenation, closure, and union operations on NFAs to construct more complex NFAs from simpler ones.

5. Preprocessing and Parsing:

- Preprocessing Steps: Identifying and counting keywords, punctuations, regular definitions, and regular expressions
  .
- Parsing Logic: Distinguishing between different types of input and applying appropriate processing based on the input type.

- **For NFA**

  - **Functions:**

    1. **setPriority :**
       - Sets the priority of the NFA

    2. **addSymbol:**
       - Adds a transition from the initial state (state 0) to a new state (state 1) using the provided input symbol.

    3. **addTransition:**
       - Adds a transition between two states with a specified input symbol.

    4. **addEpsilonTransition:**
       - Adds an epsilon transition between two states.

    5. **positiveClosure:**
       - Creates an NFA representing the positive closure (one or more occurrences) of a given NFA.

    6. **kleeneClosure:**
       - Creates an NFA representing the Kleene closure (zero or more occurrences) of a given NFA.

    7. **concatenate:**
       - Concatenates two NFAs.

    8. **Or:**
       - Performs an OR operation between two NFAs.

    9. **combine:**
       - Combines multiple NFAs into a single NFA.

    10. **getStatePriorities:**
       - Retrieves state priorities.

    11. **getStateTransitions, getEpsilonTransitions, getAlphabet:**
       - Accessors for getting NFA components.

    12. **getPriorityStrings:**
       - Retrieves priority strings.

    13. **getNfaTransitions:**
       - Generates a map representing transitions in the NFA.

Explanation of Algorithms and Techniques used:

1. **Positive Closure** (`positiveClosure`)
   - Creates a new NFA that represents the positive closure (one or more occurrences) of a given NFA.
   - It involves adding epsilon transitions from the end state to the start state and modifying transitions accordingly.

2. **Kleene Closure** (`kleeneClosure`)
   - Similar to positive closure but includes an epsilon transition from the new start state to the new end state, allowing zero occurrences.

3. **Concatenate** (`concatenate`)
   - Connects two NFAs by merging their transitions and adjusting state indices accordingly.

4. **Or**(`Or`)
   - Performs an OR operation between two NFAs by creating a new start state that connects to the start states of both NFAs via epsilon transitions.
   - Merges transitions and adjusts state indices accordingly.

5. **Combine** (`combine`)
   - Combines multiple NFAs into a single NFA by creating epsilon transitions from a new start state to the start states of all NFAs.
   - Merges transitions and adjusts state indices accordingly for each NFA.

6. **getNfaTransitions**
   - Gathers all transitions (including epsilon transitions) and organizes them into a map for easy access.

- **For DFA**
  - **Functions:**
    1. **epsilonClosure**(`int state`)
       - Calculates the epsilon closure for a given state in the NFA.
    2. **getNextStates**(`set<int> states, char symbol`)
       - Determines the set of next states for a given set of states and input symbol.
    3. **subsetConstructionAlgorithm()**
       - Performs the subset construction algorithm to convert the NFA to a DFA.
    4. **dfaMinimization()**
       - Minimizes the DFA obtained after subset construction.
    5. **DFA constructor:**
       - Takes in NFA, alphabet, and NFA's final states to construct the DFA.
    6. **Getter functions to retrieve DFA states, transitions, and final states.**

Explanation of Algorithms and Techniques used:

1. Subset Construction Algorithm:

- Begins by computing epsilon closure for the initial state of the NFA.
- Utilizes a queue to process states and symbols based on epsilon closures and transitions.
- Generates the DFA states and transitions by exploring the NFA transitions.
- Tracks final states in the DFA by considering NFA final states.

2. DFA Minimization:

- Constructs initial partitions based on final and non-final states.
- Refines partitions based on transitions, grouping states that have similar transitions.
- Reassigns states and transitions to minimize the DFA based on refined partitions.

- **For Input handler**

Explanation of Algorithms and Techniques used:

1. Token Generation:

- **read() Function:**
  - Reads the contents of a file and concatenates each line into a single string.
  - Splits the concatenated string into individual tokens using whitespace as a delimiter.
  - Stores the split tokens in the splitTokens vector.

2. Token Matching:

- **match(`string str`) Function:**
  - Takes a string str as input and attempts to match it against defined token rules using a Deterministic Finite Automaton (DFA).
  - DFA transitions are represented using the Dfa map (std::map<std::pair<int, char>, int>).
  - dfaFinalStates contains final states in the DFA, associated with token types.
  - It iterates through the characters of the input string str:
    1. Traverses the DFA based on transitions for each character.
    2. Determines the last accepted state and its position in the string.
    3. Detects errors by checking if a transition is undefined for a character in the current state.

- Handles two cases:

    1. **Case 1: Single Token Match:**

        - If the entire string is a single token, it identifies the token type and value.
        - Adds the token type to tokens vector and the token value to values vector.
        - Inserts identifiers (if token type is "id") into the ids set.
        - Returns true.

    2. **Case 2: Multiple Tokens or Error:**

        - Handles scenarios where the string contains multiple tokens or an error.
        - Splits the string accordingly based on the last accepted position (lastPos).
        - If an error is encountered (lastPos == -1), apply panic mood recovery algorithm for error
        - Continues token matching recursively for the remaining substring (str.substr(lastPos + 1)).
        - Returns false in case of an error, otherwise continues matching.

3. Token Generation Initialization:

- **tokenGenerator Constructor:**
    - Initializes the tokenGenerator object with DFA-related data and file path.
    - Calls read() to read the file content and split tokens.
    - Invokes matchAllSplitTokens() to match all the split tokens against the defined DFA rules.

4. Getters:

- **getIds(), getTokens(), getValues(), and getErrors()** are getter functions to retrieve identified identifiers, tokens, their corresponding values, and encountered errors after tokenization.

- Input file example for the lexical rules we have:

```
letter = a-z | A-Z
digit = 0 - 9
id: letter (letter|digit)*
digits = digit+
{boolean int float}
num: digit+ | digit+ .digits (\L | E digits)
relop: \=\= | !\= | > | >\= | < | <\=
assign: =
{ if else while }
[; , \( \) { }]
addop: \+ | \-
mulop: \* | /
```

c) The resultant transition table for the minimal DFA.

```
state  0 --(!)-->: state 1
state  0 --(()-->: state 2
state  0 --())-->: state 3
state  0 --(*)-->: state 4
state  0 --(+)-->: state 5
state  0 --(,)-->: state 6
state  0 --(-)-->: state 5
state  0 --(.)-->: Dead state
state  0 --(/)-->: state 4
state  0 --(0)-->: state 9
state  0 --(1)-->: state 9
state  0 --(2)-->: state 9
state  0 --(3)-->: state 9
state  0 --(4)-->: state 9
state  0 --(5)-->: state 9
state  0 --(6)-->: state 9
state  0 --(7)-->: state 9
state  0 --(8)-->: state 9
state  0 --(9)-->: state 9
state  0 --(;)-->: state 19
state  0 --(<)-->: state 20
state  0 --(=)-->: state 21
state  0 --(>)-->: state 22
state  0 --(A)-->: state 23
state  0 --(B)-->: state 23
state  0 --(C)-->: state 23
state  0 --(D)-->: state 23
state  0 --(E)-->: state 23
state  0 --(F)-->: state 23
state  0 --(G)-->: state 23
state  0 --(H)-->: state 23
state  0 --(I)-->: state 23
state  0 --(J)-->: state 23
state  0 --(K)-->: state 23
state  0 --(L)-->: state 23
state  0 --(M)-->: state 23
state  0 --(N)-->: state 23
state  0 --(O)-->: state 23
state  0 --(P)-->: state 23
state  0 --(Q)-->: state 23
state  0 --(R)-->: state 23
state  0 --(S)-->: state 23
state  0 --(T)-->: state 23
state  0 --(U)-->: state 23
state  0 --(V)-->: state 23
state  0 --(W)-->: state 23
state  0 --(X)-->: state 23
state  0 --(Y)-->: state 23
state  0 --(Z)-->: state 23
state  0 --(a)-->: state 23
state  0 --(b)-->: state 50
state  0 --(c)-->: state 23
state  0 --(d)-->: state 23
state  0 --(e)-->: state 53
state  0 --(f)-->: state 54
state  0 --(g)-->: state 23
state  0 --(h)-->: state 23
state  0 --(i)-->: state 57
state  0 --(j)-->: state 23
state  0 --(k)-->: state 23
state  0 --(l)-->: state 23
state  0 --(m)-->: state 23
state  0 --(n)-->: state 23
state  0 --(o)-->: state 23
state  0 --(p)-->: state 23
state  0 --(q)-->: state 23
state  0 --(r)-->: state 23
state  0 --(s)-->: state 23
```

```
state  0 --(t)-->: state 23
state  0 --(u)-->: state 23
state  0 --(v)-->: state 23
state  0 --(w)-->: state 71
state  0 --(x)-->: state 23
state  0 --(y)-->: state 23
state  0 --(z)-->: state 23
state  0 --({)-->: state 75
state  0 --(})-->: state 76
--------------------------------------------------------------------------------
state  1 --(!)-->: Dead state
state  1 --(()-->: Dead state
state  1 --())-->: Dead state
state  1 --(*)-->: Dead state
state  1 --(+)-->: Dead state
state  1 --(,)-->: Dead state
state  1 --(-)-->: Dead state
state  1 --(.)-->: Dead state
state  1 --(/)-->: Dead state
state  1 --(0)-->: Dead state
state  1 --(1)-->: Dead state
state  1 --(2)-->: Dead state
state  1 --(3)-->: Dead state
state  1 --(4)-->: Dead state
state  1 --(5)-->: Dead state
state  1 --(6)-->: Dead state
state  1 --(7)-->: Dead state
state  1 --(8)-->: Dead state
state  1 --(9)-->: Dead state
state  1 --(;)-->: Dead state
state  1 --(<)-->: Dead state
state  1 --(=)-->: state 77
state  1 --(>)-->: Dead state
state  1 --(A)-->: Dead state
state  1 --(B)-->: Dead state
state  1 --(C)-->: Dead state
state  1 --(D)-->: Dead state
state  1 --(E)-->: Dead state
state  1 --(F)-->: Dead state
state  1 --(G)-->: Dead state
state  1 --(H)-->: Dead state
state  1 --(I)-->: Dead state
state  1 --(J)-->: Dead state
state  1 --(K)-->: Dead state
state  1 --(L)-->: Dead state
state  1 --(M)-->: Dead state
state  1 --(N)-->: Dead state
state  1 --(O)-->: Dead state
state  1 --(P)-->: Dead state
state  1 --(Q)-->: Dead state
state  1 --(R)-->: Dead state
state  1 --(S)-->: Dead state
state  1 --(T)-->: Dead state
state  1 --(U)-->: Dead state
state  1 --(V)-->: Dead state
state  1 --(W)-->: Dead state
state  1 --(X)-->: Dead state
state  1 --(Y)-->: Dead state
state  1 --(Z)-->: Dead state
state  1 --(a)-->: Dead state
state  1 --(b)-->: Dead state
state  1 --(c)-->: Dead state
state  1 --(d)-->: Dead state
state  1 --(e)-->: Dead state
state  1 --(f)-->: Dead state
state  1 --(g)-->: Dead state
state  1 --(h)-->: Dead state
state  1 --(i)-->: Dead state
state  1 --(j)-->: Dead state
state  1 --(k)-->: Dead state
state  1 --(l)-->: Dead state
```

```
state  1 --(m)-->: Dead state
state  1 --(n)-->: Dead state
state  1 --(o)-->: Dead state
state  1 --(p)-->: Dead state
state  1 --(q)-->: Dead state
state  1 --(r)-->: Dead state
state  1 --(s)-->: Dead state
state  1 --(t)-->: Dead state
state  1 --(u)-->: Dead state
state  1 --(v)-->: Dead state
state  1 --(w)-->: Dead state
state  1 --(x)-->: Dead state
state  1 --(y)-->: Dead state
state  1 --(z)-->: Dead state
state  1 --({)-->: Dead state
state  1 --(})-->: Dead state
--------------------------------------------------------------------------------
state  2 --(!)-->: Dead state
state  2 --(()-->: Dead state
state  2 --())-->: Dead state
state  2 --(*)-->: Dead state
state  2 --(+)-->: Dead state
state  2 --(,)-->: Dead state
state  2 --(-)-->: Dead state
state  2 --(.)-->: Dead state
state  2 --(/)-->: Dead state
state  2 --(0)-->: Dead state
state  2 --(1)-->: Dead state
state  2 --(2)-->: Dead state
state  2 --(3)-->: Dead state
state  2 --(4)-->: Dead state
state  2 --(5)-->: Dead state
state  2 --(6)-->: Dead state
state  2 --(7)-->: Dead state
state  2 --(8)-->: Dead state
state  2 --(9)-->: Dead state
state  2 --(;)-->: Dead state
state  2 --(<)-->: Dead state
state  2 --(=)-->: Dead state
state  2 --(>)-->: Dead state
state  2 --(A)-->: Dead state
state  2 --(B)-->: Dead state
state  2 --(C)-->: Dead state
state  2 --(D)-->: Dead state
state  2 --(E)-->: Dead state
state  2 --(F)-->: Dead state
state  2 --(G)-->: Dead state
state  2 --(H)-->: Dead state
state  2 --(I)-->: Dead state
state  2 --(J)-->: Dead state
state  2 --(K)-->: Dead state
state  2 --(L)-->: Dead state
state  2 --(M)-->: Dead state
state  2 --(N)-->: Dead state
state  2 --(O)-->: Dead state
state  2 --(P)-->: Dead state
state  2 --(Q)-->: Dead state
state  2 --(R)-->: Dead state
state  2 --(S)-->: Dead state
state  2 --(T)-->: Dead state
state  2 --(U)-->: Dead state
state  2 --(V)-->: Dead state
state  2 --(W)-->: Dead state
state  2 --(X)-->: Dead state
state  2 --(Y)-->: Dead state
state  2 --(Z)-->: Dead state
state  2 --(a)-->: Dead state
state  2 --(b)-->: Dead state
state  2 --(c)-->: Dead state
state  2 --(d)-->: Dead state
state  2 --(e)-->: Dead state
```

```
state  2 --(f)-->: Dead state
state  2 --(g)-->: Dead state
state  2 --(h)-->: Dead state
state  2 --(i)-->: Dead state
state  2 --(j)-->: Dead state
state  2 --(k)-->: Dead state
state  2 --(l)-->: Dead state
state  2 --(m)-->: Dead state
state  2 --(n)-->: Dead state
state  2 --(o)-->: Dead state
state  2 --(p)-->: Dead state
state  2 --(q)-->: Dead state
state  2 --(r)-->: Dead state
state  2 --(s)-->: Dead state
state  2 --(t)-->: Dead state
state  2 --(u)-->: Dead state
state  2 --(v)-->: Dead state
state  2 --(w)-->: Dead state
state  2 --(x)-->: Dead state
state  2 --(y)-->: Dead state
state  2 --(z)-->: Dead state
state  2 --({)-->: Dead state
state  2 --(})-->: Dead state
--------------------------------------------------------------------------------
state  3 --(!)-->: Dead state
state  3 --(()-->: Dead state
state  3 --())-->: Dead state
state  3 --(*)-->: Dead state
state  3 --(+)-->: Dead state
state  3 --(,)-->: Dead state
state  3 --(-)-->: Dead state
state  3 --(.)-->: Dead state
state  3 --(/)-->: Dead state
state  3 --(0)-->: Dead state
state  3 --(1)-->: Dead state
state  3 --(2)-->: Dead state
state  3 --(3)-->: Dead state
state  3 --(4)-->: Dead state
state  3 --(5)-->: Dead state
state  3 --(6)-->: Dead state
state  3 --(7)-->: Dead state
state  3 --(8)-->: Dead state
state  3 --(9)-->: Dead state
state  3 --(;)-->: Dead state
state  3 --(<)-->: Dead state
state  3 --(=)-->: Dead state
state  3 --(>)-->: Dead state
state  3 --(A)-->: Dead state
state  3 --(B)-->: Dead state
state  3 --(C)-->: Dead state
state  3 --(D)-->: Dead state
state  3 --(E)-->: Dead state
state  3 --(F)-->: Dead state
state  3 --(G)-->: Dead state
state  3 --(H)-->: Dead state
state  3 --(I)-->: Dead state
state  3 --(J)-->: Dead state
state  3 --(K)-->: Dead state
state  3 --(L)-->: Dead state
state  3 --(M)-->: Dead state
state  3 --(N)-->: Dead state
state  3 --(O)-->: Dead state
state  3 --(P)-->: Dead state
state  3 --(Q)-->: Dead state
state  3 --(R)-->: Dead state
state  3 --(S)-->: Dead state
state  3 --(T)-->: Dead state
state  3 --(U)-->: Dead state
state  3 --(V)-->: Dead state
state  3 --(W)-->: Dead state
state  3 --(X)-->: Dead state
```

```
state  3 --(Y)-->: Dead state
state  3 --(Z)-->: Dead state
state  3 --(a)-->: Dead state
state  3 --(b)-->: Dead state
state  3 --(c)-->: Dead state
state  3 --(d)-->: Dead state
state  3 --(e)-->: Dead state
state  3 --(f)-->: Dead state
state  3 --(g)-->: Dead state
state  3 --(h)-->: Dead state
state  3 --(i)-->: Dead state
state  3 --(j)-->: Dead state
state  3 --(k)-->: Dead state
state  3 --(l)-->: Dead state
state  3 --(m)-->: Dead state
state  3 --(n)-->: Dead state
state  3 --(o)-->: Dead state
state  3 --(p)-->: Dead state
state  3 --(q)-->: Dead state
state  3 --(r)-->: Dead state
state  3 --(s)-->: Dead state
state  3 --(t)-->: Dead state
state  3 --(u)-->: Dead state
state  3 --(v)-->: Dead state
state  3 --(w)-->: Dead state
state  3 --(x)-->: Dead state
state  3 --(y)-->: Dead state
state  3 --(z)-->: Dead state
state  3 --({)-->: Dead state
state  3 --(})-->: Dead state
-----------------------------------------------------------------------------------
state  4 --(!)-->: Dead state
state  4 --(()-->: Dead state
state  4 --())-->: Dead state
state  4 --(*)-->: Dead state
state  4 --(+)-->: Dead state
state  4 --(,)-->: Dead state
state  4 --(-)-->: Dead state
state  4 --(.)-->: Dead state
state  4 --(/)-->: Dead state
state  4 --(0)-->: Dead state
state  4 --(1)-->: Dead state
state  4 --(2)-->: Dead state
state  4 --(3)-->: Dead state
state  4 --(4)-->: Dead state
state  4 --(5)-->: Dead state
state  4 --(6)-->: Dead state
state  4 --(7)-->: Dead state
state  4 --(8)-->: Dead state
state  4 --(9)-->: Dead state
state  4 --(;)-->: Dead state
state  4 --(<)-->: Dead state
state  4 --(=)-->: Dead state
state  4 --(>)-->: Dead state
state  4 --(A)-->: Dead state
state  4 --(B)-->: Dead state
state  4 --(C)-->: Dead state
state  4 --(D)-->: Dead state
state  4 --(E)-->: Dead state
state  4 --(F)-->: Dead state
state  4 --(G)-->: Dead state
state  4 --(H)-->: Dead state
state  4 --(I)-->: Dead state
state  4 --(J)-->: Dead state
state  4 --(K)-->: Dead state
state  4 --(L)-->: Dead state
state  4 --(M)-->: Dead state
state  4 --(N)-->: Dead state
state  4 --(O)-->: Dead state
state  4 --(P)-->: Dead state
state  4 --(Q)-->: Dead state
```

```
state  4 --(R)-->: Dead state
state  4 --(S)-->: Dead state
state  4 --(T)-->: Dead state
state  4 --(U)-->: Dead state
state  4 --(V)-->: Dead state
state  4 --(W)-->: Dead state
state  4 --(X)-->: Dead state
state  4 --(Y)-->: Dead state
state  4 --(Z)-->: Dead state
state  4 --(a)-->: Dead state
state  4 --(b)-->: Dead state
state  4 --(c)-->: Dead state
state  4 --(d)-->: Dead state
state  4 --(e)-->: Dead state
state  4 --(f)-->: Dead state
state  4 --(g)-->: Dead state
state  4 --(h)-->: Dead state
state  4 --(i)-->: Dead state
state  4 --(j)-->: Dead state
state  4 --(k)-->: Dead state
state  4 --(l)-->: Dead state
state  4 --(m)-->: Dead state
state  4 --(n)-->: Dead state
state  4 --(o)-->: Dead state
state  4 --(p)-->: Dead state
state  4 --(q)-->: Dead state
state  4 --(r)-->: Dead state
state  4 --(s)-->: Dead state
state  4 --(t)-->: Dead state
state  4 --(u)-->: Dead state
state  4 --(v)-->: Dead state
state  4 --(w)-->: Dead state
state  4 --(x)-->: Dead state
state  4 --(y)-->: Dead state
state  4 --(z)-->: Dead state
state  4 --({)-->: Dead state
state  4 --(})-->: Dead state
--------------------------------------------------------------------------------
state  5 --(!)-->: Dead state
state  5 --(()-->: Dead state
state  5 --())-->: Dead state
state  5 --(*)-->: Dead state
state  5 --(+)-->: Dead state
state  5 --(,)-->: Dead state
state  5 --(-)-->: Dead state
state  5 --(.)-->: Dead state
state  5 --(/)-->: Dead state
state  5 --(0)-->: Dead state
state  5 --(1)-->: Dead state
state  5 --(2)-->: Dead state
state  5 --(3)-->: Dead state
state  5 --(4)-->: Dead state
state  5 --(5)-->: Dead state
state  5 --(6)-->: Dead state
state  5 --(7)-->: Dead state
state  5 --(8)-->: Dead state
state  5 --(9)-->: Dead state
state  5 --(;)-->: Dead state
state  5 --(<)-->: Dead state
state  5 --(=)-->: Dead state
state  5 --(>)-->: Dead state
state  5 --(A)-->: Dead state
state  5 --(B)-->: Dead state
state  5 --(C)-->: Dead state
state  5 --(D)-->: Dead state
state  5 --(E)-->: Dead state
state  5 --(F)-->: Dead state
state  5 --(G)-->: Dead state
state  5 --(H)-->: Dead state
state  5 --(I)-->: Dead state
state  5 --(J)-->: Dead state
```

```
state  5 --(K)-->: Dead state
state  5 --(L)-->: Dead state
state  5 --(M)-->: Dead state
state  5 --(N)-->: Dead state
state  5 --(O)-->: Dead state
state  5 --(P)-->: Dead state
state  5 --(Q)-->: Dead state
state  5 --(R)-->: Dead state
state  5 --(S)-->: Dead state
state  5 --(T)-->: Dead state
state  5 --(U)-->: Dead state
state  5 --(V)-->: Dead state
state  5 --(W)-->: Dead state
state  5 --(X)-->: Dead state
state  5 --(Y)-->: Dead state
state  5 --(Z)-->: Dead state
state  5 --(a)-->: Dead state
state  5 --(b)-->: Dead state
state  5 --(c)-->: Dead state
state  5 --(d)-->: Dead state
state  5 --(e)-->: Dead state
state  5 --(f)-->: Dead state
state  5 --(g)-->: Dead state
state  5 --(h)-->: Dead state
state  5 --(i)-->: Dead state
state  5 --(j)-->: Dead state
state  5 --(k)-->: Dead state
state  5 --(l)-->: Dead state
state  5 --(m)-->: Dead state
state  5 --(n)-->: Dead state
state  5 --(o)-->: Dead state
state  5 --(p)-->: Dead state
state  5 --(q)-->: Dead state
state  5 --(r)-->: Dead state
state  5 --(s)-->: Dead state
state  5 --(t)-->: Dead state
state  5 --(u)-->: Dead state
state  5 --(v)-->: Dead state
state  5 --(w)-->: Dead state
state  5 --(x)-->: Dead state
state  5 --(y)-->: Dead state
state  5 --(z)-->: Dead state
state  5 --({)-->: Dead state
state  5 --(})-->: Dead state
--------------------------------------------------------------------------------
state  6 --(!)-->: Dead state
state  6 --(()-->: Dead state
state  6 --())-->: Dead state
state  6 --(*)-->: Dead state
state  6 --(+)-->: Dead state
state  6 --(,)-->: Dead state
state  6 --(-)-->: Dead state
state  6 --(.)-->: Dead state
state  6 --(/)-->: Dead state
state  6 --(0)-->: Dead state
state  6 --(1)-->: Dead state
state  6 --(2)-->: Dead state
state  6 --(3)-->: Dead state
state  6 --(4)-->: Dead state
state  6 --(5)-->: Dead state
state  6 --(6)-->: Dead state
state  6 --(7)-->: Dead state
state  6 --(8)-->: Dead state
state  6 --(9)-->: Dead state
state  6 --(;)-->: Dead state
state  6 --(<)-->: Dead state
state  6 --(=)-->: Dead state
state  6 --(>)-->: Dead state
state  6 --(A)-->: Dead state
state  6 --(B)-->: Dead state
state  6 --(C)-->: Dead state
```

```
state  6 --(D)-->: Dead state
state  6 --(E)-->: Dead state
state  6 --(F)-->: Dead state
state  6 --(G)-->: Dead state
state  6 --(H)-->: Dead state
state  6 --(I)-->: Dead state
state  6 --(J)-->: Dead state
state  6 --(K)-->: Dead state
state  6 --(L)-->: Dead state
state  6 --(M)-->: Dead state
state  6 --(N)-->: Dead state
state  6 --(O)-->: Dead state
state  6 --(P)-->: Dead state
state  6 --(Q)-->: Dead state
state  6 --(R)-->: Dead state
state  6 --(S)-->: Dead state
state  6 --(T)-->: Dead state
state  6 --(U)-->: Dead state
state  6 --(V)-->: Dead state
state  6 --(W)-->: Dead state
state  6 --(X)-->: Dead state
state  6 --(Y)-->: Dead state
state  6 --(Z)-->: Dead state
state  6 --(a)-->: Dead state
state  6 --(b)-->: Dead state
state  6 --(c)-->: Dead state
state  6 --(d)-->: Dead state
state  6 --(e)-->: Dead state
state  6 --(f)-->: Dead state
state  6 --(g)-->: Dead state
state  6 --(h)-->: Dead state
state  6 --(i)-->: Dead state
state  6 --(j)-->: Dead state
state  6 --(k)-->: Dead state
state  6 --(l)-->: Dead state
state  6 --(m)-->: Dead state
state  6 --(n)-->: Dead state
state  6 --(o)-->: Dead state
state  6 --(p)-->: Dead state
state  6 --(q)-->: Dead state
state  6 --(r)-->: Dead state
state  6 --(s)-->: Dead state
state  6 --(t)-->: Dead state
state  6 --(u)-->: Dead state
state  6 --(v)-->: Dead state
state  6 --(w)-->: Dead state
state  6 --(x)-->: Dead state
state  6 --(y)-->: Dead state
state  6 --(z)-->: Dead state
state  6 --({)-->: Dead state
state  6 --(})-->: Dead state
--------------------------------------------------------------------------------
state  9 --(!)-->: Dead state
state  9 --(()-->: Dead state
state  9 --())-->: Dead state
state  9 --(*)-->: Dead state
state  9 --(+)-->: Dead state
state  9 --(,)-->: Dead state
state  9 --(-)-->: Dead state
state  9 --(.)-->: state 78
state  9 --(/)-->: Dead state
state  9 --(0)-->: state 9
state  9 --(1)-->: state 9
state  9 --(2)-->: state 9
state  9 --(3)-->: state 9
state  9 --(4)-->: state 9
state  9 --(5)-->: state 9
state  9 --(6)-->: state 9
state  9 --(7)-->: state 9
state  9 --(8)-->: state 9
state  9 --(9)-->: state 9
```

```
state  9 --(;)-->: Dead state
state  9 --(<)-->: Dead state
state  9 --(=)-->: Dead state
state  9 --(>)-->: Dead state
state  9 --(A)-->: Dead state
state  9 --(B)-->: Dead state
state  9 --(C)-->: Dead state
state  9 --(D)-->: Dead state
state  9 --(E)-->: Dead state
state  9 --(F)-->: Dead state
state  9 --(G)-->: Dead state
state  9 --(H)-->: Dead state
state  9 --(I)-->: Dead state
state  9 --(J)-->: Dead state
state  9 --(K)-->: Dead state
state  9 --(L)-->: Dead state
state  9 --(M)-->: Dead state
state  9 --(N)-->: Dead state
state  9 --(O)-->: Dead state
state  9 --(P)-->: Dead state
state  9 --(Q)-->: Dead state
state  9 --(R)-->: Dead state
state  9 --(S)-->: Dead state
state  9 --(T)-->: Dead state
state  9 --(U)-->: Dead state
state  9 --(V)-->: Dead state
state  9 --(W)-->: Dead state
state  9 --(X)-->: Dead state
state  9 --(Y)-->: Dead state
state  9 --(Z)-->: Dead state
state  9 --(a)-->: Dead state
state  9 --(b)-->: Dead state
state  9 --(c)-->: Dead state
state  9 --(d)-->: Dead state
state  9 --(e)-->: Dead state
state  9 --(f)-->: Dead state
state  9 --(g)-->: Dead state
state  9 --(h)-->: Dead state
state  9 --(i)-->: Dead state
state  9 --(j)-->: Dead state
state  9 --(k)-->: Dead state
state  9 --(l)-->: Dead state
state  9 --(m)-->: Dead state
state  9 --(n)-->: Dead state
state  9 --(o)-->: Dead state
state  9 --(p)-->: Dead state
state  9 --(q)-->: Dead state
state  9 --(r)-->: Dead state
state  9 --(s)-->: Dead state
state  9 --(t)-->: Dead state
state  9 --(u)-->: Dead state
state  9 --(v)-->: Dead state
state  9 --(w)-->: Dead state
state  9 --(x)-->: Dead state
state  9 --(y)-->: Dead state
state  9 --(z)-->: Dead state
state  9 --({)-->: Dead state
state  9 --(})-->: Dead state
-------------------------------------------------------------------------------
state  19 --(!)-->: Dead state
state  19 --(()-->: Dead state
state  19 --())-->: Dead state
state  19 --(*)-->: Dead state
state  19 --(+)-->: Dead state
state  19 --(,)-->: Dead state
state  19 --(-)-->: Dead state
state  19 --(.)-->: Dead state
state  19 --(/)-->: Dead state
state  19 --(0)-->: Dead state
state  19 --(1)-->: Dead state
state  19 --(2)-->: Dead state
```

```
state  19 --(3)-->: Dead state
state  19 --(4)-->: Dead state
state  19 --(5)-->: Dead state
state  19 --(6)-->: Dead state
state  19 --(7)-->: Dead state
state  19 --(8)-->: Dead state
state  19 --(9)-->: Dead state
state  19 --(;)-->: Dead state
state  19 --(<)-->: Dead state
state  19 --(=)-->: Dead state
state  19 --(>)-->: Dead state
state  19 --(A)-->: Dead state
state  19 --(B)-->: Dead state
state  19 --(C)-->: Dead state
state  19 --(D)-->: Dead state
state  19 --(E)-->: Dead state
state  19 --(F)-->: Dead state
state  19 --(G)-->: Dead state
state  19 --(H)-->: Dead state
state  19 --(I)-->: Dead state
state  19 --(J)-->: Dead state
state  19 --(K)-->: Dead state
state  19 --(L)-->: Dead state
state  19 --(M)-->: Dead state
state  19 --(N)-->: Dead state
state  19 --(O)-->: Dead state
state  19 --(P)-->: Dead state
state  19 --(Q)-->: Dead state
state  19 --(R)-->: Dead state
state  19 --(S)-->: Dead state
state  19 --(T)-->: Dead state
state  19 --(U)-->: Dead state
state  19 --(V)-->: Dead state
state  19 --(W)-->: Dead state
state  19 --(X)-->: Dead state
state  19 --(Y)-->: Dead state
state  19 --(Z)-->: Dead state
state  19 --(a)-->: Dead state
state  19 --(b)-->: Dead state
state  19 --(c)-->: Dead state
state  19 --(d)-->: Dead state
state  19 --(e)-->: Dead state
state  19 --(f)-->: Dead state
state  19 --(g)-->: Dead state
state  19 --(h)-->: Dead state
state  19 --(i)-->: Dead state
state  19 --(j)-->: Dead state
state  19 --(k)-->: Dead state
state  19 --(l)-->: Dead state
state  19 --(m)-->: Dead state
state  19 --(n)-->: Dead state
state  19 --(o)-->: Dead state
state  19 --(p)-->: Dead state
state  19 --(q)-->: Dead state
state  19 --(r)-->: Dead state
state  19 --(s)-->: Dead state
state  19 --(t)-->: Dead state
state  19 --(u)-->: Dead state
state  19 --(v)-->: Dead state
state  19 --(w)-->: Dead state
state  19 --(x)-->: Dead state
state  19 --(y)-->: Dead state
state  19 --(z)-->: Dead state
state  19 --({)-->: Dead state
state  19 --(})-->: Dead state
--------------------------------------------------------------------------------
state  20 --(!)-->: Dead state
state  20 --(()-->: Dead state
state  20 --())-->: Dead state
state  20 --(*)-->: Dead state
state  20 --(+)-->: Dead state
```

```
state  20 --(,)-->: Dead state
state  20 --(-)-->: Dead state
state  20 --(.)-->: Dead state
state  20 --(/)-->: Dead state
state  20 --(0)-->: Dead state
state  20 --(1)-->: Dead state
state  20 --(2)-->: Dead state
state  20 --(3)-->: Dead state
state  20 --(4)-->: Dead state
state  20 --(5)-->: Dead state
state  20 --(6)-->: Dead state
state  20 --(7)-->: Dead state
state  20 --(8)-->: Dead state
state  20 --(9)-->: Dead state
state  20 --(;)-->: Dead state
state  20 --(<)-->: Dead state
state  20 --(=)-->: state 77
state  20 --(>)-->: Dead state
state  20 --(A)-->: Dead state
state  20 --(B)-->: Dead state
state  20 --(C)-->: Dead state
state  20 --(D)-->: Dead state
state  20 --(E)-->: Dead state
state  20 --(F)-->: Dead state
state  20 --(G)-->: Dead state
state  20 --(H)-->: Dead state
state  20 --(I)-->: Dead state
state  20 --(J)-->: Dead state
state  20 --(K)-->: Dead state
state  20 --(L)-->: Dead state
state  20 --(M)-->: Dead state
state  20 --(N)-->: Dead state
state  20 --(O)-->: Dead state
state  20 --(P)-->: Dead state
state  20 --(Q)-->: Dead state
state  20 --(R)-->: Dead state
state  20 --(S)-->: Dead state
state  20 --(T)-->: Dead state
state  20 --(U)-->: Dead state
state  20 --(V)-->: Dead state
state  20 --(W)-->: Dead state
state  20 --(X)-->: Dead state
state  20 --(Y)-->: Dead state
state  20 --(Z)-->: Dead state
state  20 --(a)-->: Dead state
state  20 --(b)-->: Dead state
state  20 --(c)-->: Dead state
state  20 --(d)-->: Dead state
state  20 --(e)-->: Dead state
state  20 --(f)-->: Dead state
state  20 --(g)-->: Dead state
state  20 --(h)-->: Dead state
state  20 --(i)-->: Dead state
state  20 --(j)-->: Dead state
state  20 --(k)-->: Dead state
state  20 --(l)-->: Dead state
state  20 --(m)-->: Dead state
state  20 --(n)-->: Dead state
state  20 --(o)-->: Dead state
state  20 --(p)-->: Dead state
state  20 --(q)-->: Dead state
state  20 --(r)-->: Dead state
state  20 --(s)-->: Dead state
state  20 --(t)-->: Dead state
state  20 --(u)-->: Dead state
state  20 --(v)-->: Dead state
state  20 --(w)-->: Dead state
state  20 --(x)-->: Dead state
state  20 --(y)-->: Dead state
state  20 --(z)-->: Dead state
state  20 --({)-->: Dead state
```

```
state  20 --(})-->: Dead state
--------------------------------------------------------------------------------
state  21 --(!)-->: Dead state
state  21 --(()-->: Dead state
state  21 --())-->: Dead state
state  21 --(*)-->: Dead state
state  21 --(+)-->: Dead state
state  21 --(,)-->: Dead state
state  21 --(-)-->: Dead state
state  21 --(.)-->: Dead state
state  21 --(/)-->: Dead state
state  21 --(0)-->: Dead state
state  21 --(1)-->: Dead state
state  21 --(2)-->: Dead state
state  21 --(3)-->: Dead state
state  21 --(4)-->: Dead state
state  21 --(5)-->: Dead state
state  21 --(6)-->: Dead state
state  21 --(7)-->: Dead state
state  21 --(8)-->: Dead state
state  21 --(9)-->: Dead state
state  21 --(;)-->: Dead state
state  21 --(<)-->: Dead state
state  21 --(=)-->: state 77
state  21 --(>)-->: Dead state
state  21 --(A)-->: Dead state
state  21 --(B)-->: Dead state
state  21 --(C)-->: Dead state
state  21 --(D)-->: Dead state
state  21 --(E)-->: Dead state
state  21 --(F)-->: Dead state
state  21 --(G)-->: Dead state
state  21 --(H)-->: Dead state
state  21 --(I)-->: Dead state
state  21 --(J)-->: Dead state
state  21 --(K)-->: Dead state
state  21 --(L)-->: Dead state
state  21 --(M)-->: Dead state
state  21 --(N)-->: Dead state
state  21 --(O)-->: Dead state
state  21 --(P)-->: Dead state
state  21 --(Q)-->: Dead state
state  21 --(R)-->: Dead state
state  21 --(S)-->: Dead state
state  21 --(T)-->: Dead state
state  21 --(U)-->: Dead state
state  21 --(V)-->: Dead state
state  21 --(W)-->: Dead state
state  21 --(X)-->: Dead state
state  21 --(Y)-->: Dead state
state  21 --(Z)-->: Dead state
state  21 --(a)-->: Dead state
state  21 --(b)-->: Dead state
state  21 --(c)-->: Dead state
state  21 --(d)-->: Dead state
state  21 --(e)-->: Dead state
state  21 --(f)-->: Dead state
state  21 --(g)-->: Dead state
state  21 --(h)-->: Dead state
state  21 --(i)-->: Dead state
state  21 --(j)-->: Dead state
state  21 --(k)-->: Dead state
state  21 --(l)-->: Dead state
state  21 --(m)-->: Dead state
state  21 --(n)-->: Dead state
state  21 --(o)-->: Dead state
state  21 --(p)-->: Dead state
state  21 --(q)-->: Dead state
state  21 --(r)-->: Dead state
state  21 --(s)-->: Dead state
state  21 --(t)-->: Dead state
```

```
state  21 --(u)-->: Dead state
state  21 --(v)-->: Dead state
state  21 --(w)-->: Dead state
state  21 --(x)-->: Dead state
state  21 --(y)-->: Dead state
state  21 --(z)-->: Dead state
state  21 --({)-->: Dead state
state  21 --(})-->: Dead state
--------------------------------------------------------------------------------
state  22 --(!)-->: Dead state
state  22 --(()-->: Dead state
state  22 --())-->: Dead state
state  22 --(*)-->: Dead state
state  22 --(+)-->: Dead state
state  22 --(,)-->: Dead state
state  22 --(-)-->: Dead state
state  22 --(.)-->: Dead state
state  22 --(/)-->: Dead state
state  22 --(0)-->: Dead state
state  22 --(1)-->: Dead state
state  22 --(2)-->: Dead state
state  22 --(3)-->: Dead state
state  22 --(4)-->: Dead state
state  22 --(5)-->: Dead state
state  22 --(6)-->: Dead state
state  22 --(7)-->: Dead state
state  22 --(8)-->: Dead state
state  22 --(9)-->: Dead state
state  22 --(;)-->: Dead state
state  22 --(<)-->: Dead state
state  22 --(=)-->: state 77
state  22 --(>)-->: Dead state
state  22 --(A)-->: Dead state
state  22 --(B)-->: Dead state
state  22 --(C)-->: Dead state
state  22 --(D)-->: Dead state
state  22 --(E)-->: Dead state
state  22 --(F)-->: Dead state
state  22 --(G)-->: Dead state
state  22 --(H)-->: Dead state
state  22 --(I)-->: Dead state
state  22 --(J)-->: Dead state
state  22 --(K)-->: Dead state
state  22 --(L)-->: Dead state
state  22 --(M)-->: Dead state
state  22 --(N)-->: Dead state
state  22 --(O)-->: Dead state
state  22 --(P)-->: Dead state
state  22 --(Q)-->: Dead state
state  22 --(R)-->: Dead state
state  22 --(S)-->: Dead state
state  22 --(T)-->: Dead state
state  22 --(U)-->: Dead state
state  22 --(V)-->: Dead state
state  22 --(W)-->: Dead state
state  22 --(X)-->: Dead state
state  22 --(Y)-->: Dead state
state  22 --(Z)-->: Dead state
state  22 --(a)-->: Dead state
state  22 --(b)-->: Dead state
state  22 --(c)-->: Dead state
state  22 --(d)-->: Dead state
state  22 --(e)-->: Dead state
state  22 --(f)-->: Dead state
state  22 --(g)-->: Dead state
state  22 --(h)-->: Dead state
state  22 --(i)-->: Dead state
state  22 --(j)-->: Dead state
state  22 --(k)-->: Dead state
state  22 --(l)-->: Dead state
state  22 --(m)-->: Dead state
```

```
state  22 --(n)-->: Dead state
state  22 --(o)-->: Dead state
state  22 --(p)-->: Dead state
state  22 --(q)-->: Dead state
state  22 --(r)-->: Dead state
state  22 --(s)-->: Dead state
state  22 --(t)-->: Dead state
state  22 --(u)-->: Dead state
state  22 --(v)-->: Dead state
state  22 --(w)-->: Dead state
state  22 --(x)-->: Dead state
state  22 --(y)-->: Dead state
state  22 --(z)-->: Dead state
state  22 --({)-->: Dead state
state  22 --(})-->: Dead state
--------------------------------------------------------------------------------
state  23 --(!)-->: Dead state
state  23 --(()-->: Dead state
state  23 --())-->: Dead state
state  23 --(*)-->: Dead state
state  23 --(+)-->: Dead state
state  23 --(,)-->: Dead state
state  23 --(-)-->: Dead state
state  23 --(.)-->: Dead state
state  23 --(/)-->: Dead state
state  23 --(0)-->: state 23
state  23 --(1)-->: state 23
state  23 --(2)-->: state 23
state  23 --(3)-->: state 23
state  23 --(4)-->: state 23
state  23 --(5)-->: state 23
state  23 --(6)-->: state 23
state  23 --(7)-->: state 23
state  23 --(8)-->: state 23
state  23 --(9)-->: state 23
state  23 --(;)-->: Dead state
state  23 --(<)-->: Dead state
state  23 --(=)-->: Dead state
state  23 --(>)-->: Dead state
state  23 --(A)-->: state 23
state  23 --(B)-->: state 23
state  23 --(C)-->: state 23
state  23 --(D)-->: state 23
state  23 --(E)-->: state 23
state  23 --(F)-->: state 23
state  23 --(G)-->: state 23
state  23 --(H)-->: state 23
state  23 --(I)-->: state 23
state  23 --(J)-->: state 23
state  23 --(K)-->: state 23
state  23 --(L)-->: state 23
state  23 --(M)-->: state 23
state  23 --(N)-->: state 23
state  23 --(O)-->: state 23
state  23 --(P)-->: state 23
state  23 --(Q)-->: state 23
state  23 --(R)-->: state 23
state  23 --(S)-->: state 23
state  23 --(T)-->: state 23
state  23 --(U)-->: state 23
state  23 --(V)-->: state 23
state  23 --(W)-->: state 23
state  23 --(X)-->: state 23
state  23 --(Y)-->: state 23
state  23 --(Z)-->: state 23
state  23 --(a)-->: state 23
state  23 --(b)-->: state 23
state  23 --(c)-->: state 23
state  23 --(d)-->: state 23
state  23 --(e)-->: state 23
state  23 --(f)-->: state 23
```

```
state  23 --(g)-->: state 23
state  23 --(h)-->: state 23
state  23 --(i)-->: state 23
state  23 --(j)-->: state 23
state  23 --(k)-->: state 23
state  23 --(l)-->: state 23
state  23 --(m)-->: state 23
state  23 --(n)-->: state 23
state  23 --(o)-->: state 23
state  23 --(p)-->: state 23
state  23 --(q)-->: state 23
state  23 --(r)-->: state 23
state  23 --(s)-->: state 23
state  23 --(t)-->: state 23
state  23 --(u)-->: state 23
state  23 --(v)-->: state 23
state  23 --(w)-->: state 23
state  23 --(x)-->: state 23
state  23 --(y)-->: state 23
state  23 --(z)-->: state 23
state  23 --({)-->: Dead state
state  23 --(})-->: Dead state
--------------------------------------------------------------------------------
state  50 --(!)-->: Dead state
state  50 --(()-->: Dead state
state  50 --())-->: Dead state
state  50 --(*)-->: Dead state
state  50 --(+)-->: Dead state
state  50 --(,)-->: Dead state
state  50 --(-)-->: Dead state
state  50 --(.)-->: Dead state
state  50 --(/)-->: Dead state
state  50 --(0)-->: state 23
state  50 --(1)-->: state 23
state  50 --(2)-->: state 23
state  50 --(3)-->: state 23
state  50 --(4)-->: state 23
state  50 --(5)-->: state 23
state  50 --(6)-->: state 23
state  50 --(7)-->: state 23
state  50 --(8)-->: state 23
state  50 --(9)-->: state 23
state  50 --(;)-->: Dead state
state  50 --(<)-->: Dead state
state  50 --(=)-->: Dead state
state  50 --(>)-->: Dead state
state  50 --(A)-->: state 23
state  50 --(B)-->: state 23
state  50 --(C)-->: state 23
state  50 --(D)-->: state 23
state  50 --(E)-->: state 23
state  50 --(F)-->: state 23
state  50 --(G)-->: state 23
state  50 --(H)-->: state 23
state  50 --(I)-->: state 23
state  50 --(J)-->: state 23
state  50 --(K)-->: state 23
state  50 --(L)-->: state 23
state  50 --(M)-->: state 23
state  50 --(N)-->: state 23
state  50 --(O)-->: state 23
state  50 --(P)-->: state 23
state  50 --(Q)-->: state 23
state  50 --(R)-->: state 23
state  50 --(S)-->: state 23
state  50 --(T)-->: state 23
state  50 --(U)-->: state 23
state  50 --(V)-->: state 23
state  50 --(W)-->: state 23
state  50 --(X)-->: state 23
state  50 --(Y)-->: state 23
```

```
state  50 --(Z)-->: state 23
state  50 --(a)-->: state 23
state  50 --(b)-->: state 23
state  50 --(c)-->: state 23
state  50 --(d)-->: state 23
state  50 --(e)-->: state 23
state  50 --(f)-->: state 23
state  50 --(g)-->: state 23
state  50 --(h)-->: state 23
state  50 --(i)-->: state 23
state  50 --(j)-->: state 23
state  50 --(k)-->: state 23
state  50 --(l)-->: state 23
state  50 --(m)-->: state 23
state  50 --(n)-->: state 23
state  50 --(o)-->: state 144
state  50 --(p)-->: state 23
state  50 --(q)-->: state 23
state  50 --(r)-->: state 23
state  50 --(s)-->: state 23
state  50 --(t)-->: state 23
state  50 --(u)-->: state 23
state  50 --(v)-->: state 23
state  50 --(w)-->: state 23
state  50 --(x)-->: state 23
state  50 --(y)-->: state 23
state  50 --(z)-->: state 23
state  50 --({)-->: Dead state
state  50 --(})-->: Dead state
-------------------------------------------------------------------------------
state  53 --(!)-->: Dead state
state  53 --(()-->: Dead state
state  53 --())-->: Dead state
state  53 --(*)-->: Dead state
state  53 --(+)-->: Dead state
state  53 --(,)-->: Dead state
state  53 --(-)-->: Dead state
state  53 --(.)-->: Dead state
state  53 --(/)-->: Dead state
state  53 --(0)-->: state 23
state  53 --(1)-->: state 23
state  53 --(2)-->: state 23
state  53 --(3)-->: state 23
state  53 --(4)-->: state 23
state  53 --(5)-->: state 23
state  53 --(6)-->: state 23
state  53 --(7)-->: state 23
state  53 --(8)-->: state 23
state  53 --(9)-->: state 23
state  53 --(;)-->: Dead state
state  53 --(<)-->: Dead state
state  53 --(=)-->: Dead state
state  53 --(>)-->: Dead state
state  53 --(A)-->: state 23
state  53 --(B)-->: state 23
state  53 --(C)-->: state 23
state  53 --(D)-->: state 23
state  53 --(E)-->: state 23
state  53 --(F)-->: state 23
state  53 --(G)-->: state 23
state  53 --(H)-->: state 23
state  53 --(I)-->: state 23
state  53 --(J)-->: state 23
state  53 --(K)-->: state 23
state  53 --(L)-->: state 23
state  53 --(M)-->: state 23
state  53 --(N)-->: state 23
state  53 --(O)-->: state 23
state  53 --(P)-->: state 23
state  53 --(Q)-->: state 23
state  53 --(R)-->: state 23
```

```
state  53 --(S)-->: state 23
state  53 --(T)-->: state 23
state  53 --(U)-->: state 23
state  53 --(V)-->: state 23
state  53 --(W)-->: state 23
state  53 --(X)-->: state 23
state  53 --(Y)-->: state 23
state  53 --(Z)-->: state 23
state  53 --(a)-->: state 23
state  53 --(b)-->: state 23
state  53 --(c)-->: state 23
state  53 --(d)-->: state 23
state  53 --(e)-->: state 23
state  53 --(f)-->: state 23
state  53 --(g)-->: state 23
state  53 --(h)-->: state 23
state  53 --(i)-->: state 23
state  53 --(j)-->: state 23
state  53 --(k)-->: state 23
state  53 --(l)-->: state 145
state  53 --(m)-->: state 23
state  53 --(n)-->: state 23
state  53 --(o)-->: state 23
state  53 --(p)-->: state 23
state  53 --(q)-->: state 23
state  53 --(r)-->: state 23
state  53 --(s)-->: state 23
state  53 --(t)-->: state 23
state  53 --(u)-->: state 23
state  53 --(v)-->: state 23
state  53 --(w)-->: state 23
state  53 --(x)-->: state 23
state  53 --(y)-->: state 23
state  53 --(z)-->: state 23
state  53 --({)-->: Dead state
state  53 --(})-->: Dead state
--------------------------------------------------------------------------------
state  54 --(!)-->: Dead state
state  54 --(()-->: Dead state
state  54 --())-->: Dead state
state  54 --(*)-->: Dead state
state  54 --(+)-->: Dead state
state  54 --(,)-->: Dead state
state  54 --(-)-->: Dead state
state  54 --(.)-->: Dead state
state  54 --(/)-->: Dead state
state  54 --(0)-->: state 23
state  54 --(1)-->: state 23
state  54 --(2)-->: state 23
state  54 --(3)-->: state 23
state  54 --(4)-->: state 23
state  54 --(5)-->: state 23
state  54 --(6)-->: state 23
state  54 --(7)-->: state 23
state  54 --(8)-->: state 23
state  54 --(9)-->: state 23
state  54 --(;)-->: Dead state
state  54 --(<)-->: Dead state
state  54 --(=)-->: Dead state
state  54 --(>)-->: Dead state
state  54 --(A)-->: state 23
state  54 --(B)-->: state 23
state  54 --(C)-->: state 23
state  54 --(D)-->: state 23
state  54 --(E)-->: state 23
state  54 --(F)-->: state 23
state  54 --(G)-->: state 23
state  54 --(H)-->: state 23
state  54 --(I)-->: state 23
state  54 --(J)-->: state 23
state  54 --(K)-->: state 23
```

```
state  54 --(L)-->: state 23
state  54 --(M)-->: state 23
state  54 --(N)-->: state 23
state  54 --(O)-->: state 23
state  54 --(P)-->: state 23
state  54 --(Q)-->: state 23
state  54 --(R)-->: state 23
state  54 --(S)-->: state 23
state  54 --(T)-->: state 23
state  54 --(U)-->: state 23
state  54 --(V)-->: state 23
state  54 --(W)-->: state 23
state  54 --(X)-->: state 23
state  54 --(Y)-->: state 23
state  54 --(Z)-->: state 23
state  54 --(a)-->: state 23
state  54 --(b)-->: state 23
state  54 --(c)-->: state 23
state  54 --(d)-->: state 23
state  54 --(e)-->: state 23
state  54 --(f)-->: state 23
state  54 --(g)-->: state 23
state  54 --(h)-->: state 23
state  54 --(i)-->: state 23
state  54 --(j)-->: state 23
state  54 --(k)-->: state 23
state  54 --(l)-->: state 146
state  54 --(m)-->: state 23
state  54 --(n)-->: state 23
state  54 --(o)-->: state 23
state  54 --(p)-->: state 23
state  54 --(q)-->: state 23
state  54 --(r)-->: state 23
state  54 --(s)-->: state 23
state  54 --(t)-->: state 23
state  54 --(u)-->: state 23
state  54 --(v)-->: state 23
state  54 --(w)-->: state 23
state  54 --(x)-->: state 23
state  54 --(y)-->: state 23
state  54 --(z)-->: state 23
state  54 --({)-->: Dead state
state  54 --(})-->: Dead state
--------------------------------------------------------------------------------
state  57 --(!)-->: Dead state
state  57 --(()-->: Dead state
state  57 --())-->: Dead state
state  57 --(*)-->: Dead state
state  57 --(+)-->: Dead state
state  57 --(,)-->: Dead state
state  57 --(-)-->: Dead state
state  57 --(.)-->: Dead state
state  57 --(/)-->: Dead state
state  57 --(0)-->: state 23
state  57 --(1)-->: state 23
state  57 --(2)-->: state 23
state  57 --(3)-->: state 23
state  57 --(4)-->: state 23
state  57 --(5)-->: state 23
state  57 --(6)-->: state 23
state  57 --(7)-->: state 23
state  57 --(8)-->: state 23
state  57 --(9)-->: state 23
state  57 --(;)-->: Dead state
state  57 --(<)-->: Dead state
state  57 --(=)-->: Dead state
state  57 --(>)-->: Dead state
state  57 --(A)-->: state 23
state  57 --(B)-->: state 23
state  57 --(C)-->: state 23
state  57 --(D)-->: state 23
```

```
state  57 --(E)-->: state 23
state  57 --(F)-->: state 23
state  57 --(G)-->: state 23
state  57 --(H)-->: state 23
state  57 --(I)-->: state 23
state  57 --(J)-->: state 23
state  57 --(K)-->: state 23
state  57 --(L)-->: state 23
state  57 --(M)-->: state 23
state  57 --(N)-->: state 23
state  57 --(O)-->: state 23
state  57 --(P)-->: state 23
state  57 --(Q)-->: state 23
state  57 --(R)-->: state 23
state  57 --(S)-->: state 23
state  57 --(T)-->: state 23
state  57 --(U)-->: state 23
state  57 --(V)-->: state 23
state  57 --(W)-->: state 23
state  57 --(X)-->: state 23
state  57 --(Y)-->: state 23
state  57 --(Z)-->: state 23
state  57 --(a)-->: state 23
state  57 --(b)-->: state 23
state  57 --(c)-->: state 23
state  57 --(d)-->: state 23
state  57 --(e)-->: state 23
state  57 --(f)-->: state 147
state  57 --(g)-->: state 23
state  57 --(h)-->: state 23
state  57 --(i)-->: state 23
state  57 --(j)-->: state 23
state  57 --(k)-->: state 23
state  57 --(l)-->: state 23
state  57 --(m)-->: state 23
state  57 --(n)-->: state 148
state  57 --(o)-->: state 23
state  57 --(p)-->: state 23
state  57 --(q)-->: state 23
state  57 --(r)-->: state 23
state  57 --(s)-->: state 23
state  57 --(t)-->: state 23
state  57 --(u)-->: state 23
state  57 --(v)-->: state 23
state  57 --(w)-->: state 23
state  57 --(x)-->: state 23
state  57 --(y)-->: state 23
state  57 --(z)-->: state 23
state  57 --({)-->: Dead state
state  57 --(})-->: Dead state
--------------------------------------------------------------------------------
state  71 --(!)-->: Dead state
state  71 --(()-->: Dead state
state  71 --())-->: Dead state
state  71 --(*)-->: Dead state
state  71 --(+)-->: Dead state
state  71 --(,)-->: Dead state
state  71 --(-)-->: Dead state
state  71 --(.)-->: Dead state
state  71 --(/)-->: Dead state
state  71 --(0)-->: state 23
state  71 --(1)-->: state 23
state  71 --(2)-->: state 23
state  71 --(3)-->: state 23
state  71 --(4)-->: state 23
state  71 --(5)-->: state 23
state  71 --(6)-->: state 23
state  71 --(7)-->: state 23
state  71 --(8)-->: state 23
state  71 --(9)-->: state 23
state  71 --(;)-->: Dead state
```

```
state  71 --(<)-->: Dead state
state  71 --(=)-->: Dead state
state  71 --(>)-->: Dead state
state  71 --(A)-->: state 23
state  71 --(B)-->: state 23
state  71 --(C)-->: state 23
state  71 --(D)-->: state 23
state  71 --(E)-->: state 23
state  71 --(F)-->: state 23
state  71 --(G)-->: state 23
state  71 --(H)-->: state 23
state  71 --(I)-->: state 23
state  71 --(J)-->: state 23
state  71 --(K)-->: state 23
state  71 --(L)-->: state 23
state  71 --(M)-->: state 23
state  71 --(N)-->: state 23
state  71 --(O)-->: state 23
state  71 --(P)-->: state 23
state  71 --(Q)-->: state 23
state  71 --(R)-->: state 23
state  71 --(S)-->: state 23
state  71 --(T)-->: state 23
state  71 --(U)-->: state 23
state  71 --(V)-->: state 23
state  71 --(W)-->: state 23
state  71 --(X)-->: state 23
state  71 --(Y)-->: state 23
state  71 --(Z)-->: state 23
state  71 --(a)-->: state 23
state  71 --(b)-->: state 23
state  71 --(c)-->: state 23
state  71 --(d)-->: state 23
state  71 --(e)-->: state 23
state  71 --(f)-->: state 23
state  71 --(g)-->: state 23
state  71 --(h)-->: state 149
state  71 --(i)-->: state 23
state  71 --(j)-->: state 23
state  71 --(k)-->: state 23
state  71 --(l)-->: state 23
state  71 --(m)-->: state 23
state  71 --(n)-->: state 23
state  71 --(o)-->: state 23
state  71 --(p)-->: state 23
state  71 --(q)-->: state 23
state  71 --(r)-->: state 23
state  71 --(s)-->: state 23
state  71 --(t)-->: state 23
state  71 --(u)-->: state 23
state  71 --(v)-->: state 23
state  71 --(w)-->: state 23
state  71 --(x)-->: state 23
state  71 --(y)-->: state 23
state  71 --(z)-->: state 23
state  71 --({)-->: Dead state
state  71 --(})-->: Dead state
--------------------------------------------------------------------------------
state  75 --(!)-->: Dead state
state  75 --(()-->: Dead state
state  75 --())-->: Dead state
state  75 --(*)-->: Dead state
state  75 --(+)-->: Dead state
state  75 --(,)-->: Dead state
state  75 --(-)-->: Dead state
state  75 --(.)-->: Dead state
state  75 --(/)-->: Dead state
state  75 --(0)-->: Dead state
state  75 --(1)-->: Dead state
state  75 --(2)-->: Dead state
state  75 --(3)-->: Dead state
```

```
state  75 --(4)-->: Dead state
state  75 --(5)-->: Dead state
state  75 --(6)-->: Dead state
state  75 --(7)-->: Dead state
state  75 --(8)-->: Dead state
state  75 --(9)-->: Dead state
state  75 --(;)-->: Dead state
state  75 --(<)-->: Dead state
state  75 --(=)-->: Dead state
state  75 --(>)-->: Dead state
state  75 --(A)-->: Dead state
state  75 --(B)-->: Dead state
state  75 --(C)-->: Dead state
state  75 --(D)-->: Dead state
state  75 --(E)-->: Dead state
state  75 --(F)-->: Dead state
state  75 --(G)-->: Dead state
state  75 --(H)-->: Dead state
state  75 --(I)-->: Dead state
state  75 --(J)-->: Dead state
state  75 --(K)-->: Dead state
state  75 --(L)-->: Dead state
state  75 --(M)-->: Dead state
state  75 --(N)-->: Dead state
state  75 --(O)-->: Dead state
state  75 --(P)-->: Dead state
state  75 --(Q)-->: Dead state
state  75 --(R)-->: Dead state
state  75 --(S)-->: Dead state
state  75 --(T)-->: Dead state
state  75 --(U)-->: Dead state
state  75 --(V)-->: Dead state
state  75 --(W)-->: Dead state
state  75 --(X)-->: Dead state
state  75 --(Y)-->: Dead state
state  75 --(Z)-->: Dead state
state  75 --(a)-->: Dead state
state  75 --(b)-->: Dead state
state  75 --(c)-->: Dead state
state  75 --(d)-->: Dead state
state  75 --(e)-->: Dead state
state  75 --(f)-->: Dead state
state  75 --(g)-->: Dead state
state  75 --(h)-->: Dead state
state  75 --(i)-->: Dead state
state  75 --(j)-->: Dead state
state  75 --(k)-->: Dead state
state  75 --(l)-->: Dead state
state  75 --(m)-->: Dead state
state  75 --(n)-->: Dead state
state  75 --(o)-->: Dead state
state  75 --(p)-->: Dead state
state  75 --(q)-->: Dead state
state  75 --(r)-->: Dead state
state  75 --(s)-->: Dead state
state  75 --(t)-->: Dead state
state  75 --(u)-->: Dead state
state  75 --(v)-->: Dead state
state  75 --(w)-->: Dead state
state  75 --(x)-->: Dead state
state  75 --(y)-->: Dead state
state  75 --(z)-->: Dead state
state  75 --({)-->: Dead state
state  75 --(})-->: Dead state
--------------------------------------------------------------------------------
state  76 --(!)-->: Dead state
state  76 --(()-->: Dead state
state  76 --())-->: Dead state
state  76 --(*)-->: Dead state
state  76 --(+)-->: Dead state
state  76 --(,)-->: Dead state
```

```
state  76 --(-)-->: Dead state
state  76 --(.)-->: Dead state
state  76 --(/)-->: Dead state
state  76 --(0)-->: Dead state
state  76 --(1)-->: Dead state
state  76 --(2)-->: Dead state
state  76 --(3)-->: Dead state
state  76 --(4)-->: Dead state
state  76 --(5)-->: Dead state
state  76 --(6)-->: Dead state
state  76 --(7)-->: Dead state
state  76 --(8)-->: Dead state
state  76 --(9)-->: Dead state
state  76 --(;)-->: Dead state
state  76 --(<)-->: Dead state
state  76 --(=)-->: Dead state
state  76 --(>)-->: Dead state
state  76 --(A)-->: Dead state
state  76 --(B)-->: Dead state
state  76 --(C)-->: Dead state
state  76 --(D)-->: Dead state
state  76 --(E)-->: Dead state
state  76 --(F)-->: Dead state
state  76 --(G)-->: Dead state
state  76 --(H)-->: Dead state
state  76 --(I)-->: Dead state
state  76 --(J)-->: Dead state
state  76 --(K)-->: Dead state
state  76 --(L)-->: Dead state
state  76 --(M)-->: Dead state
state  76 --(N)-->: Dead state
state  76 --(O)-->: Dead state
state  76 --(P)-->: Dead state
state  76 --(Q)-->: Dead state
state  76 --(R)-->: Dead state
state  76 --(S)-->: Dead state
state  76 --(T)-->: Dead state
state  76 --(U)-->: Dead state
state  76 --(V)-->: Dead state
state  76 --(W)-->: Dead state
state  76 --(X)-->: Dead state
state  76 --(Y)-->: Dead state
state  76 --(Z)-->: Dead state
state  76 --(a)-->: Dead state
state  76 --(b)-->: Dead state
state  76 --(c)-->: Dead state
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state  76 --(f)-->: Dead state
state  76 --(g)-->: Dead state
state  76 --(h)-->: Dead state
state  76 --(i)-->: Dead state
state  76 --(j)-->: Dead state
state  76 --(k)-->: Dead state
state  76 --(l)-->: Dead state
state  76 --(m)-->: Dead state
state  76 --(n)-->: Dead state
state  76 --(o)-->: Dead state
state  76 --(p)-->: Dead state
state  76 --(q)-->: Dead state
state  76 --(r)-->: Dead state
state  76 --(s)-->: Dead state
state  76 --(t)-->: Dead state
state  76 --(u)-->: Dead state
state  76 --(v)-->: Dead state
state  76 --(w)-->: Dead state
state  76 --(x)-->: Dead state
state  76 --(y)-->: Dead state
state  76 --(z)-->: Dead state
state  76 --({)-->: Dead state
state  76 --(})-->: Dead state
```

```
--------------------------------------------------------------------------------
state  77 --(!)-->: Dead state
state  77 --(()-->: Dead state
state  77 --())-->: Dead state
state  77 --(*)-->: Dead state
state  77 --(+)-->: Dead state
state  77 --(,)-->: Dead state
state  77 --(-)-->: Dead state
state  77 --(.)-->: Dead state
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state  77 --(0)-->: Dead state
state  77 --(1)-->: Dead state
state  77 --(2)-->: Dead state
state  77 --(3)-->: Dead state
state  77 --(4)-->: Dead state
state  77 --(5)-->: Dead state
state  77 --(6)-->: Dead state
state  77 --(7)-->: Dead state
state  77 --(8)-->: Dead state
state  77 --(9)-->: Dead state
state  77 --(;)-->: Dead state
state  77 --(<)-->: Dead state
state  77 --(=)-->: Dead state
state  77 --(>)-->: Dead state
state  77 --(A)-->: Dead state
state  77 --(B)-->: Dead state
state  77 --(C)-->: Dead state
state  77 --(D)-->: Dead state
state  77 --(E)-->: Dead state
state  77 --(F)-->: Dead state
state  77 --(G)-->: Dead state
state  77 --(H)-->: Dead state
state  77 --(I)-->: Dead state
state  77 --(J)-->: Dead state
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state  77 --(N)-->: Dead state
state  77 --(O)-->: Dead state
state  77 --(P)-->: Dead state
state  77 --(Q)-->: Dead state
state  77 --(R)-->: Dead state
state  77 --(S)-->: Dead state
state  77 --(T)-->: Dead state
state  77 --(U)-->: Dead state
state  77 --(V)-->: Dead state
state  77 --(W)-->: Dead state
state  77 --(X)-->: Dead state
state  77 --(Y)-->: Dead state
state  77 --(Z)-->: Dead state
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state  77 --(c)-->: Dead state
state  77 --(d)-->: Dead state
state  77 --(e)-->: Dead state
state  77 --(f)-->: Dead state
state  77 --(g)-->: Dead state
state  77 --(h)-->: Dead state
state  77 --(i)-->: Dead state
state  77 --(j)-->: Dead state
state  77 --(k)-->: Dead state
state  77 --(l)-->: Dead state
state  77 --(m)-->: Dead state
state  77 --(n)-->: Dead state
state  77 --(o)-->: Dead state
state  77 --(p)-->: Dead state
state  77 --(q)-->: Dead state
state  77 --(r)-->: Dead state
state  77 --(s)-->: Dead state
state  77 --(t)-->: Dead state
state  77 --(u)-->: Dead state
```

```
state  77 --(v)-->: Dead state
state  77 --(w)-->: Dead state
state  77 --(x)-->: Dead state
state  77 --(y)-->: Dead state
state  77 --(z)-->: Dead state
state  77 --({)-->: Dead state
state  77 --(})-->: Dead state
--------------------------------------------------------------------------------
state  78 --(!)-->: Dead state
state  78 --(()-->: Dead state
state  78 --())-->: Dead state
state  78 --(*)-->: Dead state
state  78 --(+)-->: Dead state
state  78 --(,)-->: Dead state
state  78 --(-)-->: Dead state
state  78 --(.)-->: Dead state
state  78 --(/)-->: Dead state
state  78 --(0)-->: state 150
state  78 --(1)-->: state 150
state  78 --(2)-->: state 150
state  78 --(3)-->: state 150
state  78 --(4)-->: state 150
state  78 --(5)-->: state 150
state  78 --(6)-->: state 150
state  78 --(7)-->: state 150
state  78 --(8)-->: state 150
state  78 --(9)-->: state 150
state  78 --(;)-->: Dead state
state  78 --(<)-->: Dead state
state  78 --(=)-->: Dead state
state  78 --(>)-->: Dead state
state  78 --(A)-->: Dead state
state  78 --(B)-->: Dead state
state  78 --(C)-->: Dead state
state  78 --(D)-->: Dead state
state  78 --(E)-->: Dead state
state  78 --(F)-->: Dead state
state  78 --(G)-->: Dead state
state  78 --(H)-->: Dead state
state  78 --(I)-->: Dead state
state  78 --(J)-->: Dead state
state  78 --(K)-->: Dead state
state  78 --(L)-->: Dead state
state  78 --(M)-->: Dead state
state  78 --(N)-->: Dead state
state  78 --(O)-->: Dead state
state  78 --(P)-->: Dead state
state  78 --(Q)-->: Dead state
state  78 --(R)-->: Dead state
state  78 --(S)-->: Dead state
state  78 --(T)-->: Dead state
state  78 --(U)-->: Dead state
state  78 --(V)-->: Dead state
state  78 --(W)-->: Dead state
state  78 --(X)-->: Dead state
state  78 --(Y)-->: Dead state
state  78 --(Z)-->: Dead state
state  78 --(a)-->: Dead state
state  78 --(b)-->: Dead state
state  78 --(c)-->: Dead state
state  78 --(d)-->: Dead state
state  78 --(e)-->: Dead state
state  78 --(f)-->: Dead state
state  78 --(g)-->: Dead state
state  78 --(h)-->: Dead state
state  78 --(i)-->: Dead state
state  78 --(j)-->: Dead state
state  78 --(k)-->: Dead state
state  78 --(l)-->: Dead state
state  78 --(m)-->: Dead state
state  78 --(n)-->: Dead state
```

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state  78 --(o)-->: Dead state
state  78 --(p)-->: Dead state
state  78 --(q)-->: Dead state
state  78 --(r)-->: Dead state
state  78 --(s)-->: Dead state
state  78 --(t)-->: Dead state
state  78 --(u)-->: Dead state
state  78 --(v)-->: Dead state
state  78 --(w)-->: Dead state
state  78 --(x)-->: Dead state
state  78 --(y)-->: Dead state
state  78 --(z)-->: Dead state
state  78 --({)-->: Dead state
state  78 --(})-->: Dead state
--------------------------------------------------------------------------------
state  144 --(!)-->: Dead state
state  144 --(()-->: Dead state
state  144 --())-->: Dead state
state  144 --(*)-->: Dead state
state  144 --(+)-->: Dead state
state  144 --(,)-->: Dead state
state  144 --(-)-->: Dead state
state  144 --(.)-->: Dead state
state  144 --(/)-->: Dead state
state  144 --(0)-->: state 23
state  144 --(1)-->: state 23
state  144 --(2)-->: state 23
state  144 --(3)-->: state 23
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state  144 --(9)-->: state 23
state  144 --(;)-->: Dead state
state  144 --(<)-->: Dead state
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state  144 --(A)-->: state 23
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state  144 --(E)-->: state 23
state  144 --(F)-->: state 23
state  144 --(G)-->: state 23
state  144 --(H)-->: state 23
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state  144 --(J)-->: state 23
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state  144 --(N)-->: state 23
state  144 --(O)-->: state 23
state  144 --(P)-->: state 23
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state  144 --(S)-->: state 23
state  144 --(T)-->: state 23
state  144 --(U)-->: state 23
state  144 --(V)-->: state 23
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state  144 --(X)-->: state 23
state  144 --(Y)-->: state 23
state  144 --(Z)-->: state 23
state  144 --(a)-->: state 23
state  144 --(b)-->: state 23
state  144 --(c)-->: state 23
state  144 --(d)-->: state 23
state  144 --(e)-->: state 23
state  144 --(f)-->: state 23
state  144 --(g)-->: state 23
```

```
state  144 --(h)-->: state 23
state  144 --(i)-->: state 23
state  144 --(j)-->: state 23
state  144 --(k)-->: state 23
state  144 --(l)-->: state 23
state  144 --(m)-->: state 23
state  144 --(n)-->: state 23
state  144 --(o)-->: state 160
state  144 --(p)-->: state 23
state  144 --(q)-->: state 23
state  144 --(r)-->: state 23
state  144 --(s)-->: state 23
state  144 --(t)-->: state 23
state  144 --(u)-->: state 23
state  144 --(v)-->: state 23
state  144 --(w)-->: state 23
state  144 --(x)-->: state 23
state  144 --(y)-->: state 23
state  144 --(z)-->: state 23
state  144 --({)-->: Dead state
state  144 --(})-->: Dead state
----------------------------------------------------------------------------
state  145 --(!)-->: Dead state
state  145 --(()-->: Dead state
state  145 --())-->: Dead state
state  145 --(*)-->: Dead state
state  145 --(+)-->: Dead state
state  145 --(,)-->: Dead state
state  145 --(-)-->: Dead state
state  145 --(.)-->: Dead state
state  145 --(/)-->: Dead state
state  145 --(0)-->: state 23
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state  145 --(2)-->: state 23
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state  145 --(8)-->: state 23
state  145 --(9)-->: state 23
state  145 --(;)-->: Dead state
state  145 --(<)-->: Dead state
state  145 --(=)-->: Dead state
state  145 --(>)-->: Dead state
state  145 --(A)-->: state 23
state  145 --(B)-->: state 23
state  145 --(C)-->: state 23
state  145 --(D)-->: state 23
state  145 --(E)-->: state 23
state  145 --(F)-->: state 23
state  145 --(G)-->: state 23
state  145 --(H)-->: state 23
state  145 --(I)-->: state 23
state  145 --(J)-->: state 23
state  145 --(K)-->: state 23
state  145 --(L)-->: state 23
state  145 --(M)-->: state 23
state  145 --(N)-->: state 23
state  145 --(O)-->: state 23
state  145 --(P)-->: state 23
state  145 --(Q)-->: state 23
state  145 --(R)-->: state 23
state  145 --(S)-->: state 23
state  145 --(T)-->: state 23
state  145 --(U)-->: state 23
state  145 --(V)-->: state 23
state  145 --(W)-->: state 23
state  145 --(X)-->: state 23
state  145 --(Y)-->: state 23
state  145 --(Z)-->: state 23
```

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state  145 --(a)-->: state 23
state  145 --(b)-->: state 23
state  145 --(c)-->: state 23
state  145 --(d)-->: state 23
state  145 --(e)-->: state 23
state  145 --(f)-->: state 23
state  145 --(g)-->: state 23
state  145 --(h)-->: state 23
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state  145 --(j)-->: state 23
state  145 --(k)-->: state 23
state  145 --(l)-->: state 23
state  145 --(m)-->: state 23
state  145 --(n)-->: state 23
state  145 --(o)-->: state 23
state  145 --(p)-->: state 23
state  145 --(q)-->: state 23
state  145 --(r)-->: state 23
state  145 --(s)-->: state 161
state  145 --(t)-->: state 23
state  145 --(u)-->: state 23
state  145 --(v)-->: state 23
state  145 --(w)-->: state 23
state  145 --(x)-->: state 23
state  145 --(y)-->: state 23
state  145 --(z)-->: state 23
state  145 --({)-->: Dead state
state  145 --(})-->: Dead state
----------------------------------------------------------------------------
state  146 --(!)-->: Dead state
state  146 --(()-->: Dead state
state  146 --())-->: Dead state
state  146 --(*)-->: Dead state
state  146 --(+)-->: Dead state
state  146 --(,)-->: Dead state
state  146 --(-)-->: Dead state
state  146 --(.)-->: Dead state
state  146 --(/)-->: Dead state
state  146 --(0)-->: state 23
state  146 --(1)-->: state 23
state  146 --(2)-->: state 23
state  146 --(3)-->: state 23
state  146 --(4)-->: state 23
state  146 --(5)-->: state 23
state  146 --(6)-->: state 23
state  146 --(7)-->: state 23
state  146 --(8)-->: state 23
state  146 --(9)-->: state 23
state  146 --(;)-->: Dead state
state  146 --(<)-->: Dead state
state  146 --(=)-->: Dead state
state  146 --(>)-->: Dead state
state  146 --(A)-->: state 23
state  146 --(B)-->: state 23
state  146 --(C)-->: state 23
state  146 --(D)-->: state 23
state  146 --(E)-->: state 23
state  146 --(F)-->: state 23
state  146 --(G)-->: state 23
state  146 --(H)-->: state 23
state  146 --(I)-->: state 23
state  146 --(J)-->: state 23
state  146 --(K)-->: state 23
state  146 --(L)-->: state 23
state  146 --(M)-->: state 23
state  146 --(N)-->: state 23
state  146 --(O)-->: state 23
state  146 --(P)-->: state 23
state  146 --(Q)-->: state 23
state  146 --(R)-->: state 23
state  146 --(S)-->: state 23
```

```
state  146 --(T)-->: state 23
state  146 --(U)-->: state 23
state  146 --(V)-->: state 23
state  146 --(W)-->: state 23
state  146 --(X)-->: state 23
state  146 --(Y)-->: state 23
state  146 --(Z)-->: state 23
state  146 --(a)-->: state 23
state  146 --(b)-->: state 23
state  146 --(c)-->: state 23
state  146 --(d)-->: state 23
state  146 --(e)-->: state 23
state  146 --(f)-->: state 23
state  146 --(g)-->: state 23
state  146 --(h)-->: state 23
state  146 --(i)-->: state 23
state  146 --(j)-->: state 23
state  146 --(k)-->: state 23
state  146 --(l)-->: state 23
state  146 --(m)-->: state 23
state  146 --(n)-->: state 23
state  146 --(o)-->: state 162
state  146 --(p)-->: state 23
state  146 --(q)-->: state 23
state  146 --(r)-->: state 23
state  146 --(s)-->: state 23
state  146 --(t)-->: state 23
state  146 --(u)-->: state 23
state  146 --(v)-->: state 23
state  146 --(w)-->: state 23
state  146 --(x)-->: state 23
state  146 --(y)-->: state 23
state  146 --(z)-->: state 23
state  146 --({)-->: Dead state
state  146 --(})-->: Dead state
--------------------------------------------------------------------------------
state  147 --(!)-->: Dead state
state  147 --(()-->: Dead state
state  147 --())-->: Dead state
state  147 --(*)-->: Dead state
state  147 --(+)-->: Dead state
state  147 --(,)-->: Dead state
state  147 --(-)-->: Dead state
state  147 --(.)-->: Dead state
state  147 --(/)-->: Dead state
state  147 --(0)-->: state 23
state  147 --(1)-->: state 23
state  147 --(2)-->: state 23
state  147 --(3)-->: state 23
state  147 --(4)-->: state 23
state  147 --(5)-->: state 23
state  147 --(6)-->: state 23
state  147 --(7)-->: state 23
state  147 --(8)-->: state 23
state  147 --(9)-->: state 23
state  147 --(;)-->: Dead state
state  147 --(<)-->: Dead state
state  147 --(=)-->: Dead state
state  147 --(>)-->: Dead state
state  147 --(A)-->: state 23
state  147 --(B)-->: state 23
state  147 --(C)-->: state 23
state  147 --(D)-->: state 23
state  147 --(E)-->: state 23
state  147 --(F)-->: state 23
state  147 --(G)-->: state 23
state  147 --(H)-->: state 23
state  147 --(I)-->: state 23
state  147 --(J)-->: state 23
state  147 --(K)-->: state 23
state  147 --(L)-->: state 23
```

```
state  147 --(M)-->: state 23
state  147 --(N)-->: state 23
state  147 --(O)-->: state 23
state  147 --(P)-->: state 23
state  147 --(Q)-->: state 23
state  147 --(R)-->: state 23
state  147 --(S)-->: state 23
state  147 --(T)-->: state 23
state  147 --(U)-->: state 23
state  147 --(V)-->: state 23
state  147 --(W)-->: state 23
state  147 --(X)-->: state 23
state  147 --(Y)-->: state 23
state  147 --(Z)-->: state 23
state  147 --(a)-->: state 23
state  147 --(b)-->: state 23
state  147 --(c)-->: state 23
state  147 --(d)-->: state 23
state  147 --(e)-->: state 23
state  147 --(f)-->: state 23
state  147 --(g)-->: state 23
state  147 --(h)-->: state 23
state  147 --(i)-->: state 23
state  147 --(j)-->: state 23
state  147 --(k)-->: state 23
state  147 --(l)-->: state 23
state  147 --(m)-->: state 23
state  147 --(n)-->: state 23
state  147 --(o)-->: state 23
state  147 --(p)-->: state 23
state  147 --(q)-->: state 23
state  147 --(r)-->: state 23
state  147 --(s)-->: state 23
state  147 --(t)-->: state 23
state  147 --(u)-->: state 23
state  147 --(v)-->: state 23
state  147 --(w)-->: state 23
state  147 --(x)-->: state 23
state  147 --(y)-->: state 23
state  147 --(z)-->: state 23
state  147 --({)-->: Dead state
state  147 --(})-->: Dead state
-------------------------------------------------------------------------------
state  148 --(!)-->: Dead state
state  148 --(()-->: Dead state
state  148 --())-->: Dead state
state  148 --(*)-->: Dead state
state  148 --(+)-->: Dead state
state  148 --(,)-->: Dead state
state  148 --(-)-->: Dead state
state  148 --(.)-->: Dead state
state  148 --(/)-->: Dead state
state  148 --(0)-->: state 23
state  148 --(1)-->: state 23
state  148 --(2)-->: state 23
state  148 --(3)-->: state 23
state  148 --(4)-->: state 23
state  148 --(5)-->: state 23
state  148 --(6)-->: state 23
state  148 --(7)-->: state 23
state  148 --(8)-->: state 23
state  148 --(9)-->: state 23
state  148 --(;)-->: Dead state
state  148 --(<)-->: Dead state
state  148 --(=)-->: Dead state
state  148 --(>)-->: Dead state
state  148 --(A)-->: state 23
state  148 --(B)-->: state 23
state  148 --(C)-->: state 23
state  148 --(D)-->: state 23
state  148 --(E)-->: state 23
```

```
state  148 --(F)-->: state 23
state  148 --(G)-->: state 23
state  148 --(H)-->: state 23
state  148 --(I)-->: state 23
state  148 --(J)-->: state 23
state  148 --(K)-->: state 23
state  148 --(L)-->: state 23
state  148 --(M)-->: state 23
state  148 --(N)-->: state 23
state  148 --(O)-->: state 23
state  148 --(P)-->: state 23
state  148 --(Q)-->: state 23
state  148 --(R)-->: state 23
state  148 --(S)-->: state 23
state  148 --(T)-->: state 23
state  148 --(U)-->: state 23
state  148 --(V)-->: state 23
state  148 --(W)-->: state 23
state  148 --(X)-->: state 23
state  148 --(Y)-->: state 23
state  148 --(Z)-->: state 23
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state  148 --(b)-->: state 23
state  148 --(c)-->: state 23
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state  148 --(f)-->: state 23
state  148 --(g)-->: state 23
state  148 --(h)-->: state 23
state  148 --(i)-->: state 23
state  148 --(j)-->: state 23
state  148 --(k)-->: state 23
state  148 --(l)-->: state 23
state  148 --(m)-->: state 23
state  148 --(n)-->: state 23
state  148 --(o)-->: state 23
state  148 --(p)-->: state 23
state  148 --(q)-->: state 23
state  148 --(r)-->: state 23
state  148 --(s)-->: state 23
state  148 --(t)-->: state 163
state  148 --(u)-->: state 23
state  148 --(v)-->: state 23
state  148 --(w)-->: state 23
state  148 --(x)-->: state 23
state  148 --(y)-->: state 23
state  148 --(z)-->: state 23
state  148 --({)-->: Dead state
state  148 --(})-->: Dead state
----------------------------------------------------------------------------------
state  149 --(!)-->: Dead state
state  149 --(()-->: Dead state
state  149 --())-->: Dead state
state  149 --(*)-->: Dead state
state  149 --(+)-->: Dead state
state  149 --(,)-->: Dead state
state  149 --(-)-->: Dead state
state  149 --(.)-->: Dead state
state  149 --(/)-->: Dead state
state  149 --(0)-->: state 23
state  149 --(1)-->: state 23
state  149 --(2)-->: state 23
state  149 --(3)-->: state 23
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state  149 --(5)-->: state 23
state  149 --(6)-->: state 23
state  149 --(7)-->: state 23
state  149 --(8)-->: state 23
state  149 --(9)-->: state 23
state  149 --(;)-->: Dead state
state  149 --(<)-->: Dead state
```

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state  149 --(=)-->: Dead state
state  149 --(>)-->: Dead state
state  149 --(A)-->: state 23
state  149 --(B)-->: state 23
state  149 --(C)-->: state 23
state  149 --(D)-->: state 23
state  149 --(E)-->: state 23
state  149 --(F)-->: state 23
state  149 --(G)-->: state 23
state  149 --(H)-->: state 23
state  149 --(I)-->: state 23
state  149 --(J)-->: state 23
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state  149 --(U)-->: state 23
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state  149 --(W)-->: state 23
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state  149 --(Z)-->: state 23
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state  149 --(d)-->: state 23
state  149 --(e)-->: state 23
state  149 --(f)-->: state 23
state  149 --(g)-->: state 23
state  149 --(h)-->: state 23
state  149 --(i)-->: state 164
state  149 --(j)-->: state 23
state  149 --(k)-->: state 23
state  149 --(l)-->: state 23
state  149 --(m)-->: state 23
state  149 --(n)-->: state 23
state  149 --(o)-->: state 23
state  149 --(p)-->: state 23
state  149 --(q)-->: state 23
state  149 --(r)-->: state 23
state  149 --(s)-->: state 23
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state  149 --(u)-->: state 23
state  149 --(v)-->: state 23
state  149 --(w)-->: state 23
state  149 --(x)-->: state 23
state  149 --(y)-->: state 23
state  149 --(z)-->: state 23
state  149 --({)-->: Dead state
state  149 --(})-->: Dead state
--------------------------------------------------------------------------------
state  150 --(!)-->: Dead state
state  150 --(()-->: Dead state
state  150 --())-->: Dead state
state  150 --(*)-->: Dead state
state  150 --(+)-->: Dead state
state  150 --(,)-->: Dead state
state  150 --(-)-->: Dead state
state  150 --(.)-->: Dead state
state  150 --(/)-->: Dead state
state  150 --(0)-->: state 150
state  150 --(1)-->: state 150
state  150 --(2)-->: state 150
state  150 --(3)-->: state 150
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state  150 --(5)-->: state 150
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state  150 --(9)-->: state 150
state  150 --(;)-->: Dead state
state  150 --(<)-->: Dead state
state  150 --(=)-->: Dead state
state  150 --(>)-->: Dead state
state  150 --(A)-->: Dead state
state  150 --(B)-->: Dead state
state  150 --(C)-->: Dead state
state  150 --(D)-->: Dead state
state  150 --(E)-->: state 165
state  150 --(F)-->: Dead state
state  150 --(G)-->: Dead state
state  150 --(H)-->: Dead state
state  150 --(I)-->: Dead state
state  150 --(J)-->: Dead state
state  150 --(K)-->: Dead state
state  150 --(L)-->: Dead state
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state  150 --(f)-->: Dead state
state  150 --(g)-->: Dead state
state  150 --(h)-->: Dead state
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state  150 --(k)-->: Dead state
state  150 --(l)-->: Dead state
state  150 --(m)-->: Dead state
state  150 --(n)-->: Dead state
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state  150 --(s)-->: Dead state
state  150 --(t)-->: Dead state
state  150 --(u)-->: Dead state
state  150 --(v)-->: Dead state
state  150 --(w)-->: Dead state
state  150 --(x)-->: Dead state
state  150 --(y)-->: Dead state
state  150 --(z)-->: Dead state
state  150 --({)-->: Dead state
state  150 --(})-->: Dead state
--------------------------------------------------------------------------------
state  160 --(!)-->: Dead state
state  160 --(()-->: Dead state
state  160 --())-->: Dead state
state  160 --(*)-->: Dead state
state  160 --(+)-->: Dead state
state  160 --(,)-->: Dead state
state  160 --(-)-->: Dead state
```

```
state  160 --(.)-->: Dead state
state  160 --(/)-->: Dead state
state  160 --(0)-->: state 23
state  160 --(1)-->: state 23
state  160 --(2)-->: state 23
state  160 --(3)-->: state 23
state  160 --(4)-->: state 23
state  160 --(5)-->: state 23
state  160 --(6)-->: state 23
state  160 --(7)-->: state 23
state  160 --(8)-->: state 23
state  160 --(9)-->: state 23
state  160 --(;)-->: Dead state
state  160 --(<)-->: Dead state
state  160 --(=)-->: Dead state
state  160 --(>)-->: Dead state
state  160 --(A)-->: state 23
state  160 --(B)-->: state 23
state  160 --(C)-->: state 23
state  160 --(D)-->: state 23
state  160 --(E)-->: state 23
state  160 --(F)-->: state 23
state  160 --(G)-->: state 23
state  160 --(H)-->: state 23
state  160 --(I)-->: state 23
state  160 --(J)-->: state 23
state  160 --(K)-->: state 23
state  160 --(L)-->: state 23
state  160 --(M)-->: state 23
state  160 --(N)-->: state 23
state  160 --(O)-->: state 23
state  160 --(P)-->: state 23
state  160 --(Q)-->: state 23
state  160 --(R)-->: state 23
state  160 --(S)-->: state 23
state  160 --(T)-->: state 23
state  160 --(U)-->: state 23
state  160 --(V)-->: state 23
state  160 --(W)-->: state 23
state  160 --(X)-->: state 23
state  160 --(Y)-->: state 23
state  160 --(Z)-->: state 23
state  160 --(a)-->: state 23
state  160 --(b)-->: state 23
state  160 --(c)-->: state 23
state  160 --(d)-->: state 23
state  160 --(e)-->: state 23
state  160 --(f)-->: state 23
state  160 --(g)-->: state 23
state  160 --(h)-->: state 23
state  160 --(i)-->: state 23
state  160 --(j)-->: state 23
state  160 --(k)-->: state 23
state  160 --(l)-->: state 166
state  160 --(m)-->: state 23
state  160 --(n)-->: state 23
state  160 --(o)-->: state 23
state  160 --(p)-->: state 23
state  160 --(q)-->: state 23
state  160 --(r)-->: state 23
state  160 --(s)-->: state 23
state  160 --(t)-->: state 23
state  160 --(u)-->: state 23
state  160 --(v)-->: state 23
state  160 --(w)-->: state 23
state  160 --(x)-->: state 23
state  160 --(y)-->: state 23
state  160 --(z)-->: state 23
state  160 --({)-->: Dead state
state  160 --(})-->: Dead state
--------------------------------------------------------------------------------
```

```
state  161 --(!)-->: Dead state
state  161 --(()-->: Dead state
state  161 --())-->: Dead state
state  161 --(*)-->: Dead state
state  161 --(+)-->: Dead state
state  161 --(,)-->: Dead state
state  161 --(-)-->: Dead state
state  161 --(.)-->: Dead state
state  161 --(/)-->: Dead state
state  161 --(0)-->: state 23
state  161 --(1)-->: state 23
state  161 --(2)-->: state 23
state  161 --(3)-->: state 23
state  161 --(4)-->: state 23
state  161 --(5)-->: state 23
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state  161 --(7)-->: state 23
state  161 --(8)-->: state 23
state  161 --(9)-->: state 23
state  161 --(;)-->: Dead state
state  161 --(<)-->: Dead state
state  161 --(=)-->: Dead state
state  161 --(>)-->: Dead state
state  161 --(A)-->: state 23
state  161 --(B)-->: state 23
state  161 --(C)-->: state 23
state  161 --(D)-->: state 23
state  161 --(E)-->: state 23
state  161 --(F)-->: state 23
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state  161 --(H)-->: state 23
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state  161 --(P)-->: state 23
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state  161 --(T)-->: state 23
state  161 --(U)-->: state 23
state  161 --(V)-->: state 23
state  161 --(W)-->: state 23
state  161 --(X)-->: state 23
state  161 --(Y)-->: state 23
state  161 --(Z)-->: state 23
state  161 --(a)-->: state 23
state  161 --(b)-->: state 23
state  161 --(c)-->: state 23
state  161 --(d)-->: state 23
state  161 --(e)-->: state 167
state  161 --(f)-->: state 23
state  161 --(g)-->: state 23
state  161 --(h)-->: state 23
state  161 --(i)-->: state 23
state  161 --(j)-->: state 23
state  161 --(k)-->: state 23
state  161 --(l)-->: state 23
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state  161 --(o)-->: state 23
state  161 --(p)-->: state 23
state  161 --(q)-->: state 23
state  161 --(r)-->: state 23
state  161 --(s)-->: state 23
state  161 --(t)-->: state 23
state  161 --(u)-->: state 23
state  161 --(v)-->: state 23
```

```
state  161 --(w)-->: state 23
state  161 --(x)-->: state 23
state  161 --(y)-->: state 23
state  161 --(z)-->: state 23
state  161 --({)-->: Dead state
state  161 --(})-->: Dead state
--------------------------------------------------------------------------------
state  162 --(!)-->: Dead state
state  162 --(()-->: Dead state
state  162 --())-->: Dead state
state  162 --(*)-->: Dead state
state  162 --(+)-->: Dead state
state  162 --(,)-->: Dead state
state  162 --(-)-->: Dead state
state  162 --(.)-->: Dead state
state  162 --(/)-->: Dead state
state  162 --(0)-->: state 23
state  162 --(1)-->: state 23
state  162 --(2)-->: state 23
state  162 --(3)-->: state 23
state  162 --(4)-->: state 23
state  162 --(5)-->: state 23
state  162 --(6)-->: state 23
state  162 --(7)-->: state 23
state  162 --(8)-->: state 23
state  162 --(9)-->: state 23
state  162 --(;)-->: Dead state
state  162 --(<)-->: Dead state
state  162 --(=)-->: Dead state
state  162 --(>)-->: Dead state
state  162 --(A)-->: state 23
state  162 --(B)-->: state 23
state  162 --(C)-->: state 23
state  162 --(D)-->: state 23
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state  162 --(N)-->: state 23
state  162 --(O)-->: state 23
state  162 --(P)-->: state 23
state  162 --(Q)-->: state 23
state  162 --(R)-->: state 23
state  162 --(S)-->: state 23
state  162 --(T)-->: state 23
state  162 --(U)-->: state 23
state  162 --(V)-->: state 23
state  162 --(W)-->: state 23
state  162 --(X)-->: state 23
state  162 --(Y)-->: state 23
state  162 --(Z)-->: state 23
state  162 --(a)-->: state 168
state  162 --(b)-->: state 23
state  162 --(c)-->: state 23
state  162 --(d)-->: state 23
state  162 --(e)-->: state 23
state  162 --(f)-->: state 23
state  162 --(g)-->: state 23
state  162 --(h)-->: state 23
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state  162 --(j)-->: state 23
state  162 --(k)-->: state 23
state  162 --(l)-->: state 23
state  162 --(m)-->: state 23
state  162 --(n)-->: state 23
state  162 --(o)-->: state 23
```

```
state  162 --(p)-->: state 23
state  162 --(q)-->: state 23
state  162 --(r)-->: state 23
state  162 --(s)-->: state 23
state  162 --(t)-->: state 23
state  162 --(u)-->: state 23
state  162 --(v)-->: state 23
state  162 --(w)-->: state 23
state  162 --(x)-->: state 23
state  162 --(y)-->: state 23
state  162 --(z)-->: state 23
state  162 --({)-->: Dead state
state  162 --(})-->: Dead state
--------------------------------------------------------------------------------
state  163 --(!)-->: Dead state
state  163 --(()-->: Dead state
state  163 --())-->: Dead state
state  163 --(*)-->: Dead state
state  163 --(+)-->: Dead state
state  163 --(,)-->: Dead state
state  163 --(-)-->: Dead state
state  163 --(.)-->: Dead state
state  163 --(/)-->: Dead state
state  163 --(0)-->: state 23
state  163 --(1)-->: state 23
state  163 --(2)-->: state 23
state  163 --(3)-->: state 23
state  163 --(4)-->: state 23
state  163 --(5)-->: state 23
state  163 --(6)-->: state 23
state  163 --(7)-->: state 23
state  163 --(8)-->: state 23
state  163 --(9)-->: state 23
state  163 --(;)-->: Dead state
state  163 --(<)-->: Dead state
state  163 --(=)-->: Dead state
state  163 --(>)-->: Dead state
state  163 --(A)-->: state 23
state  163 --(B)-->: state 23
state  163 --(C)-->: state 23
state  163 --(D)-->: state 23
state  163 --(E)-->: state 23
state  163 --(F)-->: state 23
state  163 --(G)-->: state 23
state  163 --(H)-->: state 23
state  163 --(I)-->: state 23
state  163 --(J)-->: state 23
state  163 --(K)-->: state 23
state  163 --(L)-->: state 23
state  163 --(M)-->: state 23
state  163 --(N)-->: state 23
state  163 --(O)-->: state 23
state  163 --(P)-->: state 23
state  163 --(Q)-->: state 23
state  163 --(R)-->: state 23
state  163 --(S)-->: state 23
state  163 --(T)-->: state 23
state  163 --(U)-->: state 23
state  163 --(V)-->: state 23
state  163 --(W)-->: state 23
state  163 --(X)-->: state 23
state  163 --(Y)-->: state 23
state  163 --(Z)-->: state 23
state  163 --(a)-->: state 23
state  163 --(b)-->: state 23
state  163 --(c)-->: state 23
state  163 --(d)-->: state 23
state  163 --(e)-->: state 23
state  163 --(f)-->: state 23
state  163 --(g)-->: state 23
state  163 --(h)-->: state 23
```

```
state  163 --(i)-->: state 23
state  163 --(j)-->: state 23
state  163 --(k)-->: state 23
state  163 --(l)-->: state 23
state  163 --(m)-->: state 23
state  163 --(n)-->: state 23
state  163 --(o)-->: state 23
state  163 --(p)-->: state 23
state  163 --(q)-->: state 23
state  163 --(r)-->: state 23
state  163 --(s)-->: state 23
state  163 --(t)-->: state 23
state  163 --(u)-->: state 23
state  163 --(v)-->: state 23
state  163 --(w)-->: state 23
state  163 --(x)-->: state 23
state  163 --(y)-->: state 23
state  163 --(z)-->: state 23
state  163 --({)-->: Dead state
state  163 --(})-->: Dead state
--------------------------------------------------------------------------------
state  164 --(!)-->: Dead state
state  164 --(()-->: Dead state
state  164 --())-->: Dead state
state  164 --(*)-->: Dead state
state  164 --(+)-->: Dead state
state  164 --(,)-->: Dead state
state  164 --(-)-->: Dead state
state  164 --(.)-->: Dead state
state  164 --(/)-->: Dead state
state  164 --(0)-->: state 23
state  164 --(1)-->: state 23
state  164 --(2)-->: state 23
state  164 --(3)-->: state 23
state  164 --(4)-->: state 23
state  164 --(5)-->: state 23
state  164 --(6)-->: state 23
state  164 --(7)-->: state 23
state  164 --(8)-->: state 23
state  164 --(9)-->: state 23
state  164 --(;)-->: Dead state
state  164 --(<)-->: Dead state
state  164 --(=)-->: Dead state
state  164 --(>)-->: Dead state
state  164 --(A)-->: state 23
state  164 --(B)-->: state 23
state  164 --(C)-->: state 23
state  164 --(D)-->: state 23
state  164 --(E)-->: state 23
state  164 --(F)-->: state 23
state  164 --(G)-->: state 23
state  164 --(H)-->: state 23
state  164 --(I)-->: state 23
state  164 --(J)-->: state 23
state  164 --(K)-->: state 23
state  164 --(L)-->: state 23
state  164 --(M)-->: state 23
state  164 --(N)-->: state 23
state  164 --(O)-->: state 23
state  164 --(P)-->: state 23
state  164 --(Q)-->: state 23
state  164 --(R)-->: state 23
state  164 --(S)-->: state 23
state  164 --(T)-->: state 23
state  164 --(U)-->: state 23
state  164 --(V)-->: state 23
state  164 --(W)-->: state 23
state  164 --(X)-->: state 23
state  164 --(Y)-->: state 23
state  164 --(Z)-->: state 23
state  164 --(a)-->: state 23
```

```
state  164 --(b)-->: state 23
state  164 --(c)-->: state 23
state  164 --(d)-->: state 23
state  164 --(e)-->: state 23
state  164 --(f)-->: state 23
state  164 --(g)-->: state 23
state  164 --(h)-->: state 23
state  164 --(i)-->: state 23
state  164 --(j)-->: state 23
state  164 --(k)-->: state 23
state  164 --(l)-->: state 169
state  164 --(m)-->: state 23
state  164 --(n)-->: state 23
state  164 --(o)-->: state 23
state  164 --(p)-->: state 23
state  164 --(q)-->: state 23
state  164 --(r)-->: state 23
state  164 --(s)-->: state 23
state  164 --(t)-->: state 23
state  164 --(u)-->: state 23
state  164 --(v)-->: state 23
state  164 --(w)-->: state 23
state  164 --(x)-->: state 23
state  164 --(y)-->: state 23
state  164 --(z)-->: state 23
state  164 --({)-->: Dead state
state  164 --(})-->: Dead state
-------------------------------------------------------------------------------
state  165 --(!)-->: Dead state
state  165 --(()-->: Dead state
state  165 --())-->: Dead state
state  165 --(*)-->: Dead state
state  165 --(+)-->: Dead state
state  165 --(,)-->: Dead state
state  165 --(-)-->: Dead state
state  165 --(.)-->: Dead state
state  165 --(/)-->: Dead state
state  165 --(0)-->: state 170
state  165 --(1)-->: state 170
state  165 --(2)-->: state 170
state  165 --(3)-->: state 170
state  165 --(4)-->: state 170
state  165 --(5)-->: state 170
state  165 --(6)-->: state 170
state  165 --(7)-->: state 170
state  165 --(8)-->: state 170
state  165 --(9)-->: state 170
state  165 --(;)-->: Dead state
state  165 --(<)-->: Dead state
state  165 --(=)-->: Dead state
state  165 --(>)-->: Dead state
state  165 --(A)-->: Dead state
state  165 --(B)-->: Dead state
state  165 --(C)-->: Dead state
state  165 --(D)-->: Dead state
state  165 --(E)-->: Dead state
state  165 --(F)-->: Dead state
state  165 --(G)-->: Dead state
state  165 --(H)-->: Dead state
state  165 --(I)-->: Dead state
state  165 --(J)-->: Dead state
state  165 --(K)-->: Dead state
state  165 --(L)-->: Dead state
state  165 --(M)-->: Dead state
state  165 --(N)-->: Dead state
state  165 --(O)-->: Dead state
state  165 --(P)-->: Dead state
state  165 --(Q)-->: Dead state
state  165 --(R)-->: Dead state
state  165 --(S)-->: Dead state
state  165 --(T)-->: Dead state
```

```
state  165 --(U)-->: Dead state
state  165 --(V)-->: Dead state
state  165 --(W)-->: Dead state
state  165 --(X)-->: Dead state
state  165 --(Y)-->: Dead state
state  165 --(Z)-->: Dead state
state  165 --(a)-->: Dead state
state  165 --(b)-->: Dead state
state  165 --(c)-->: Dead state
state  165 --(d)-->: Dead state
state  165 --(e)-->: Dead state
state  165 --(f)-->: Dead state
state  165 --(g)-->: Dead state
state  165 --(h)-->: Dead state
state  165 --(i)-->: Dead state
state  165 --(j)-->: Dead state
state  165 --(k)-->: Dead state
state  165 --(l)-->: Dead state
state  165 --(m)-->: Dead state
state  165 --(n)-->: Dead state
state  165 --(o)-->: Dead state
state  165 --(p)-->: Dead state
state  165 --(q)-->: Dead state
state  165 --(r)-->: Dead state
state  165 --(s)-->: Dead state
state  165 --(t)-->: Dead state
state  165 --(u)-->: Dead state
state  165 --(v)-->: Dead state
state  165 --(w)-->: Dead state
state  165 --(x)-->: Dead state
state  165 --(y)-->: Dead state
state  165 --(z)-->: Dead state
state  165 --({)-->: Dead state
state  165 --(})-->: Dead state
----------------------------------------------------------------------------
state  166 --(!)-->: Dead state
state  166 --(()-->: Dead state
state  166 --())-->: Dead state
state  166 --(*)-->: Dead state
state  166 --(+)-->: Dead state
state  166 --(,)-->: Dead state
state  166 --(-)-->: Dead state
state  166 --(.)-->: Dead state
state  166 --(/)-->: Dead state
state  166 --(0)-->: state 23
state  166 --(1)-->: state 23
state  166 --(2)-->: state 23
state  166 --(3)-->: state 23
state  166 --(4)-->: state 23
state  166 --(5)-->: state 23
state  166 --(6)-->: state 23
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state  166 --(9)-->: state 23
state  166 --(;)-->: Dead state
state  166 --(<)-->: Dead state
state  166 --(=)-->: Dead state
state  166 --(>)-->: Dead state
state  166 --(A)-->: state 23
state  166 --(B)-->: state 23
state  166 --(C)-->: state 23
state  166 --(D)-->: state 23
state  166 --(E)-->: state 23
state  166 --(F)-->: state 23
state  166 --(G)-->: state 23
state  166 --(H)-->: state 23
state  166 --(I)-->: state 23
state  166 --(J)-->: state 23
state  166 --(K)-->: state 23
state  166 --(L)-->: state 23
state  166 --(M)-->: state 23
```

```
state  166 --(N)-->: state 23
state  166 --(O)-->: state 23
state  166 --(P)-->: state 23
state  166 --(Q)-->: state 23
state  166 --(R)-->: state 23
state  166 --(S)-->: state 23
state  166 --(T)-->: state 23
state  166 --(U)-->: state 23
state  166 --(V)-->: state 23
state  166 --(W)-->: state 23
state  166 --(X)-->: state 23
state  166 --(Y)-->: state 23
state  166 --(Z)-->: state 23
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state  166 --(b)-->: state 23
state  166 --(c)-->: state 23
state  166 --(d)-->: state 23
state  166 --(e)-->: state 180
state  166 --(f)-->: state 23
state  166 --(g)-->: state 23
state  166 --(h)-->: state 23
state  166 --(i)-->: state 23
state  166 --(j)-->: state 23
state  166 --(k)-->: state 23
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state  166 --(m)-->: state 23
state  166 --(n)-->: state 23
state  166 --(o)-->: state 23
state  166 --(p)-->: state 23
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state  166 --(r)-->: state 23
state  166 --(s)-->: state 23
state  166 --(t)-->: state 23
state  166 --(u)-->: state 23
state  166 --(v)-->: state 23
state  166 --(w)-->: state 23
state  166 --(x)-->: state 23
state  166 --(y)-->: state 23
state  166 --(z)-->: state 23
state  166 --({)-->: Dead state
state  166 --(})-->: Dead state
--------------------------------------------------------------------------------
state  167 --(!)-->: Dead state
state  167 --(()-->: Dead state
state  167 --())-->: Dead state
state  167 --(*)-->: Dead state
state  167 --(+)-->: Dead state
state  167 --(,)-->: Dead state
state  167 --(-)-->: Dead state
state  167 --(.)-->: Dead state
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state  167 --(0)-->: state 23
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state  167 --(3)-->: state 23
state  167 --(4)-->: state 23
state  167 --(5)-->: state 23
state  167 --(6)-->: state 23
state  167 --(7)-->: state 23
state  167 --(8)-->: state 23
state  167 --(9)-->: state 23
state  167 --(;)-->: Dead state
state  167 --(<)-->: Dead state
state  167 --(=)-->: Dead state
state  167 --(>)-->: Dead state
state  167 --(A)-->: state 23
state  167 --(B)-->: state 23
state  167 --(C)-->: state 23
state  167 --(D)-->: state 23
state  167 --(E)-->: state 23
state  167 --(F)-->: state 23
```

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state  167 --(G)-->: state 23
state  167 --(H)-->: state 23
state  167 --(I)-->: state 23
state  167 --(J)-->: state 23
state  167 --(K)-->: state 23
state  167 --(L)-->: state 23
state  167 --(M)-->: state 23
state  167 --(N)-->: state 23
state  167 --(O)-->: state 23
state  167 --(P)-->: state 23
state  167 --(Q)-->: state 23
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state  167 --(T)-->: state 23
state  167 --(U)-->: state 23
state  167 --(V)-->: state 23
state  167 --(W)-->: state 23
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state  167 --(Z)-->: state 23
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state  167 --(i)-->: state 23
state  167 --(j)-->: state 23
state  167 --(k)-->: state 23
state  167 --(l)-->: state 23
state  167 --(m)-->: state 23
state  167 --(n)-->: state 23
state  167 --(o)-->: state 23
state  167 --(p)-->: state 23
state  167 --(q)-->: state 23
state  167 --(r)-->: state 23
state  167 --(s)-->: state 23
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state  167 --(u)-->: state 23
state  167 --(v)-->: state 23
state  167 --(w)-->: state 23
state  167 --(x)-->: state 23
state  167 --(y)-->: state 23
state  167 --(z)-->: state 23
state  167 --({)-->: Dead state
state  167 --(})-->: Dead state
--------------------------------------------------------------------------------
state  168 --(!)-->: Dead state
state  168 --(()-->: Dead state
state  168 --())-->: Dead state
state  168 --(*)-->: Dead state
state  168 --(+)-->: Dead state
state  168 --(,)-->: Dead state
state  168 --(-)-->: Dead state
state  168 --(.)-->: Dead state
state  168 --(/)-->: Dead state
state  168 --(0)-->: state 23
state  168 --(1)-->: state 23
state  168 --(2)-->: state 23
state  168 --(3)-->: state 23
state  168 --(4)-->: state 23
state  168 --(5)-->: state 23
state  168 --(6)-->: state 23
state  168 --(7)-->: state 23
state  168 --(8)-->: state 23
state  168 --(9)-->: state 23
state  168 --(;)-->: Dead state
state  168 --(<)-->: Dead state
state  168 --(=)-->: Dead state
```

```
state  168 --(>)-->: Dead state
state  168 --(A)-->: state 23
state  168 --(B)-->: state 23
state  168 --(C)-->: state 23
state  168 --(D)-->: state 23
state  168 --(E)-->: state 23
state  168 --(F)-->: state 23
state  168 --(G)-->: state 23
state  168 --(H)-->: state 23
state  168 --(I)-->: state 23
state  168 --(J)-->: state 23
state  168 --(K)-->: state 23
state  168 --(L)-->: state 23
state  168 --(M)-->: state 23
state  168 --(N)-->: state 23
state  168 --(O)-->: state 23
state  168 --(P)-->: state 23
state  168 --(Q)-->: state 23
state  168 --(R)-->: state 23
state  168 --(S)-->: state 23
state  168 --(T)-->: state 23
state  168 --(U)-->: state 23
state  168 --(V)-->: state 23
state  168 --(W)-->: state 23
state  168 --(X)-->: state 23
state  168 --(Y)-->: state 23
state  168 --(Z)-->: state 23
state  168 --(a)-->: state 23
state  168 --(b)-->: state 23
state  168 --(c)-->: state 23
state  168 --(d)-->: state 23
state  168 --(e)-->: state 23
state  168 --(f)-->: state 23
state  168 --(g)-->: state 23
state  168 --(h)-->: state 23
state  168 --(i)-->: state 23
state  168 --(j)-->: state 23
state  168 --(k)-->: state 23
state  168 --(l)-->: state 23
state  168 --(m)-->: state 23
state  168 --(n)-->: state 23
state  168 --(o)-->: state 23
state  168 --(p)-->: state 23
state  168 --(q)-->: state 23
state  168 --(r)-->: state 23
state  168 --(s)-->: state 23
state  168 --(t)-->: state 181
state  168 --(u)-->: state 23
state  168 --(v)-->: state 23
state  168 --(w)-->: state 23
state  168 --(x)-->: state 23
state  168 --(y)-->: state 23
state  168 --(z)-->: state 23
state  168 --({)-->: Dead state
state  168 --(})-->: Dead state
-------------------------------------------------------------------------------
state  169 --(!)-->: Dead state
state  169 --(()-->: Dead state
state  169 --())-->: Dead state
state  169 --(*)-->: Dead state
state  169 --(+)-->: Dead state
state  169 --(,)-->: Dead state
state  169 --(-)-->: Dead state
state  169 --(.)-->: Dead state
state  169 --(/)-->: Dead state
state  169 --(0)-->: state 23
state  169 --(1)-->: state 23
state  169 --(2)-->: state 23
state  169 --(3)-->: state 23
state  169 --(4)-->: state 23
state  169 --(5)-->: state 23
```

```
state  169 --(6)-->: state 23
state  169 --(7)-->: state 23
state  169 --(8)-->: state 23
state  169 --(9)-->: state 23
state  169 --(;)-->: Dead state
state  169 --(<)-->: Dead state
state  169 --(=)-->: Dead state
state  169 --(>)-->: Dead state
state  169 --(A)-->: state 23
state  169 --(B)-->: state 23
state  169 --(C)-->: state 23
state  169 --(D)-->: state 23
state  169 --(E)-->: state 23
state  169 --(F)-->: state 23
state  169 --(G)-->: state 23
state  169 --(H)-->: state 23
state  169 --(I)-->: state 23
state  169 --(J)-->: state 23
state  169 --(K)-->: state 23
state  169 --(L)-->: state 23
state  169 --(M)-->: state 23
state  169 --(N)-->: state 23
state  169 --(O)-->: state 23
state  169 --(P)-->: state 23
state  169 --(Q)-->: state 23
state  169 --(R)-->: state 23
state  169 --(S)-->: state 23
state  169 --(T)-->: state 23
state  169 --(U)-->: state 23
state  169 --(V)-->: state 23
state  169 --(W)-->: state 23
state  169 --(X)-->: state 23
state  169 --(Y)-->: state 23
state  169 --(Z)-->: state 23
state  169 --(a)-->: state 23
state  169 --(b)-->: state 23
state  169 --(c)-->: state 23
state  169 --(d)-->: state 23
state  169 --(e)-->: state 182
state  169 --(f)-->: state 23
state  169 --(g)-->: state 23
state  169 --(h)-->: state 23
state  169 --(i)-->: state 23
state  169 --(j)-->: state 23
state  169 --(k)-->: state 23
state  169 --(l)-->: state 23
state  169 --(m)-->: state 23
state  169 --(n)-->: state 23
state  169 --(o)-->: state 23
state  169 --(p)-->: state 23
state  169 --(q)-->: state 23
state  169 --(r)-->: state 23
state  169 --(s)-->: state 23
state  169 --(t)-->: state 23
state  169 --(u)-->: state 23
state  169 --(v)-->: state 23
state  169 --(w)-->: state 23
state  169 --(x)-->: state 23
state  169 --(y)-->: state 23
state  169 --(z)-->: state 23
state  169 --({)-->: Dead state
state  169 --(})-->: Dead state
--------------------------------------------------------------------------------
state  170 --(!)-->: Dead state
state  170 --(()-->: Dead state
state  170 --())-->: Dead state
state  170 --(*)-->: Dead state
state  170 --(+)-->: Dead state
state  170 --(,)-->: Dead state
state  170 --(-)-->: Dead state
state  170 --(.)-->: Dead state
```

```
state  170 --(/)-->: Dead state
state  170 --(0)-->: state 170
state  170 --(1)-->: state 170
state  170 --(2)-->: state 170
state  170 --(3)-->: state 170
state  170 --(4)-->: state 170
state  170 --(5)-->: state 170
state  170 --(6)-->: state 170
state  170 --(7)-->: state 170
state  170 --(8)-->: state 170
state  170 --(9)-->: state 170
state  170 --(;)-->: Dead state
state  170 --(<)-->: Dead state
state  170 --(=)-->: Dead state
state  170 --(>)-->: Dead state
state  170 --(A)-->: Dead state
state  170 --(B)-->: Dead state
state  170 --(C)-->: Dead state
state  170 --(D)-->: Dead state
state  170 --(E)-->: Dead state
state  170 --(F)-->: Dead state
state  170 --(G)-->: Dead state
state  170 --(H)-->: Dead state
state  170 --(I)-->: Dead state
state  170 --(J)-->: Dead state
state  170 --(K)-->: Dead state
state  170 --(L)-->: Dead state
state  170 --(M)-->: Dead state
state  170 --(N)-->: Dead state
state  170 --(O)-->: Dead state
state  170 --(P)-->: Dead state
state  170 --(Q)-->: Dead state
state  170 --(R)-->: Dead state
state  170 --(S)-->: Dead state
state  170 --(T)-->: Dead state
state  170 --(U)-->: Dead state
state  170 --(V)-->: Dead state
state  170 --(W)-->: Dead state
state  170 --(X)-->: Dead state
state  170 --(Y)-->: Dead state
state  170 --(Z)-->: Dead state
state  170 --(a)-->: Dead state
state  170 --(b)-->: Dead state
state  170 --(c)-->: Dead state
state  170 --(d)-->: Dead state
state  170 --(e)-->: Dead state
state  170 --(f)-->: Dead state
state  170 --(g)-->: Dead state
state  170 --(h)-->: Dead state
state  170 --(i)-->: Dead state
state  170 --(j)-->: Dead state
state  170 --(k)-->: Dead state
state  170 --(l)-->: Dead state
state  170 --(m)-->: Dead state
state  170 --(n)-->: Dead state
state  170 --(o)-->: Dead state
state  170 --(p)-->: Dead state
state  170 --(q)-->: Dead state
state  170 --(r)-->: Dead state
state  170 --(s)-->: Dead state
state  170 --(t)-->: Dead state
state  170 --(u)-->: Dead state
state  170 --(v)-->: Dead state
state  170 --(w)-->: Dead state
state  170 --(x)-->: Dead state
state  170 --(y)-->: Dead state
state  170 --(z)-->: Dead state
state  170 --({)-->: Dead state
state  170 --(})-->: Dead state
-------------------------------------------------------------------------------
state  180 --(!)-->: Dead state
```

```
state  180 --(()-->: Dead state
state  180 --())-->: Dead state
state  180 --(*)-->: Dead state
state  180 --(+)-->: Dead state
state  180 --(,)-->: Dead state
state  180 --(-)-->: Dead state
state  180 --(.)-->: Dead state
state  180 --(/)-->: Dead state
state  180 --(0)-->: state 23
state  180 --(1)-->: state 23
state  180 --(2)-->: state 23
state  180 --(3)-->: state 23
state  180 --(4)-->: state 23
state  180 --(5)-->: state 23
state  180 --(6)-->: state 23
state  180 --(7)-->: state 23
state  180 --(8)-->: state 23
state  180 --(9)-->: state 23
state  180 --(;)-->: Dead state
state  180 --(<)-->: Dead state
state  180 --(=)-->: Dead state
state  180 --(>)-->: Dead state
state  180 --(A)-->: state 23
state  180 --(B)-->: state 23
state  180 --(C)-->: state 23
state  180 --(D)-->: state 23
state  180 --(E)-->: state 23
state  180 --(F)-->: state 23
state  180 --(G)-->: state 23
state  180 --(H)-->: state 23
state  180 --(I)-->: state 23
state  180 --(J)-->: state 23
state  180 --(K)-->: state 23
state  180 --(L)-->: state 23
state  180 --(M)-->: state 23
state  180 --(N)-->: state 23
state  180 --(O)-->: state 23
state  180 --(P)-->: state 23
state  180 --(Q)-->: state 23
state  180 --(R)-->: state 23
state  180 --(S)-->: state 23
state  180 --(T)-->: state 23
state  180 --(U)-->: state 23
state  180 --(V)-->: state 23
state  180 --(W)-->: state 23
state  180 --(X)-->: state 23
state  180 --(Y)-->: state 23
state  180 --(Z)-->: state 23
state  180 --(a)-->: state 183
state  180 --(b)-->: state 23
state  180 --(c)-->: state 23
state  180 --(d)-->: state 23
state  180 --(e)-->: state 23
state  180 --(f)-->: state 23
state  180 --(g)-->: state 23
state  180 --(h)-->: state 23
state  180 --(i)-->: state 23
state  180 --(j)-->: state 23
state  180 --(k)-->: state 23
state  180 --(l)-->: state 23
state  180 --(m)-->: state 23
state  180 --(n)-->: state 23
state  180 --(o)-->: state 23
state  180 --(p)-->: state 23
state  180 --(q)-->: state 23
state  180 --(r)-->: state 23
state  180 --(s)-->: state 23
state  180 --(t)-->: state 23
state  180 --(u)-->: state 23
state  180 --(v)-->: state 23
state  180 --(w)-->: state 23
```

```
state  180 --(x)-->: state 23
state  180 --(y)-->: state 23
state  180 --(z)-->: state 23
state  180 --({)-->: Dead state
state  180 --(})-->: Dead state
-------------------------------------------------------------------------------
state  181 --(!)-->: Dead state
state  181 --(()-->: Dead state
state  181 --())-->: Dead state
state  181 --(*)-->: Dead state
state  181 --(+)-->: Dead state
state  181 --(,)-->: Dead state
state  181 --(-)-->: Dead state
state  181 --(.)-->: Dead state
state  181 --(/)-->: Dead state
state  181 --(0)-->: state 23
state  181 --(1)-->: state 23
state  181 --(2)-->: state 23
state  181 --(3)-->: state 23
state  181 --(4)-->: state 23
state  181 --(5)-->: state 23
state  181 --(6)-->: state 23
state  181 --(7)-->: state 23
state  181 --(8)-->: state 23
state  181 --(9)-->: state 23
state  181 --(;)-->: Dead state
state  181 --(<)-->: Dead state
state  181 --(=)-->: Dead state
state  181 --(>)-->: Dead state
state  181 --(A)-->: state 23
state  181 --(B)-->: state 23
state  181 --(C)-->: state 23
state  181 --(D)-->: state 23
state  181 --(E)-->: state 23
state  181 --(F)-->: state 23
state  181 --(G)-->: state 23
state  181 --(H)-->: state 23
state  181 --(I)-->: state 23
state  181 --(J)-->: state 23
state  181 --(K)-->: state 23
state  181 --(L)-->: state 23
state  181 --(M)-->: state 23
state  181 --(N)-->: state 23
state  181 --(O)-->: state 23
state  181 --(P)-->: state 23
state  181 --(Q)-->: state 23
state  181 --(R)-->: state 23
state  181 --(S)-->: state 23
state  181 --(T)-->: state 23
state  181 --(U)-->: state 23
state  181 --(V)-->: state 23
state  181 --(W)-->: state 23
state  181 --(X)-->: state 23
state  181 --(Y)-->: state 23
state  181 --(Z)-->: state 23
state  181 --(a)-->: state 23
state  181 --(b)-->: state 23
state  181 --(c)-->: state 23
state  181 --(d)-->: state 23
state  181 --(e)-->: state 23
state  181 --(f)-->: state 23
state  181 --(g)-->: state 23
state  181 --(h)-->: state 23
state  181 --(i)-->: state 23
state  181 --(j)-->: state 23
state  181 --(k)-->: state 23
state  181 --(l)-->: state 23
state  181 --(m)-->: state 23
state  181 --(n)-->: state 23
state  181 --(o)-->: state 23
state  181 --(p)-->: state 23
```

```
state  181 --(q)-->: state 23
state  181 --(r)-->: state 23
state  181 --(s)-->: state 23
state  181 --(t)-->: state 23
state  181 --(u)-->: state 23
state  181 --(v)-->: state 23
state  181 --(w)-->: state 23
state  181 --(x)-->: state 23
state  181 --(y)-->: state 23
state  181 --(z)-->: state 23
state  181 --({)-->: Dead state
state  181 --(})-->: Dead state
--------------------------------------------------------------------------------
state  182 --(!)-->: Dead state
state  182 --(()-->: Dead state
state  182 --())-->: Dead state
state  182 --(*)-->: Dead state
state  182 --(+)-->: Dead state
state  182 --(,)-->: Dead state
state  182 --(-)-->: Dead state
state  182 --(.)-->: Dead state
state  182 --(/)-->: Dead state
state  182 --(0)-->: state 23
state  182 --(1)-->: state 23
state  182 --(2)-->: state 23
state  182 --(3)-->: state 23
state  182 --(4)-->: state 23
state  182 --(5)-->: state 23
state  182 --(6)-->: state 23
state  182 --(7)-->: state 23
state  182 --(8)-->: state 23
state  182 --(9)-->: state 23
state  182 --(;)-->: Dead state
state  182 --(<)-->: Dead state
state  182 --(=)-->: Dead state
state  182 --(>)-->: Dead state
state  182 --(A)-->: state 23
state  182 --(B)-->: state 23
state  182 --(C)-->: state 23
state  182 --(D)-->: state 23
state  182 --(E)-->: state 23
state  182 --(F)-->: state 23
state  182 --(G)-->: state 23
state  182 --(H)-->: state 23
state  182 --(I)-->: state 23
state  182 --(J)-->: state 23
state  182 --(K)-->: state 23
state  182 --(L)-->: state 23
state  182 --(M)-->: state 23
state  182 --(N)-->: state 23
state  182 --(O)-->: state 23
state  182 --(P)-->: state 23
state  182 --(Q)-->: state 23
state  182 --(R)-->: state 23
state  182 --(S)-->: state 23
state  182 --(T)-->: state 23
state  182 --(U)-->: state 23
state  182 --(V)-->: state 23
state  182 --(W)-->: state 23
state  182 --(X)-->: state 23
state  182 --(Y)-->: state 23
state  182 --(Z)-->: state 23
state  182 --(a)-->: state 23
state  182 --(b)-->: state 23
state  182 --(c)-->: state 23
state  182 --(d)-->: state 23
state  182 --(e)-->: state 23
state  182 --(f)-->: state 23
state  182 --(g)-->: state 23
state  182 --(h)-->: state 23
state  182 --(i)-->: state 23
```

```
state  182 --(j)-->: state 23
state  182 --(k)-->: state 23
state  182 --(l)-->: state 23
state  182 --(m)-->: state 23
state  182 --(n)-->: state 23
state  182 --(o)-->: state 23
state  182 --(p)-->: state 23
state  182 --(q)-->: state 23
state  182 --(r)-->: state 23
state  182 --(s)-->: state 23
state  182 --(t)-->: state 23
state  182 --(u)-->: state 23
state  182 --(v)-->: state 23
state  182 --(w)-->: state 23
state  182 --(x)-->: state 23
state  182 --(y)-->: state 23
state  182 --(z)-->: state 23
state  182 --({)-->: Dead state
state  182 --(})-->: Dead state
-------------------------------------------------------------------------------
state  183 --(!)-->: Dead state
state  183 --(()-->: Dead state
state  183 --())-->: Dead state
state  183 --(*)-->: Dead state
state  183 --(+)-->: Dead state
state  183 --(,)-->: Dead state
state  183 --(-)-->: Dead state
state  183 --(.)-->: Dead state
state  183 --(/)-->: Dead state
state  183 --(0)-->: state 23
state  183 --(1)-->: state 23
state  183 --(2)-->: state 23
state  183 --(3)-->: state 23
state  183 --(4)-->: state 23
state  183 --(5)-->: state 23
state  183 --(6)-->: state 23
state  183 --(7)-->: state 23
state  183 --(8)-->: state 23
state  183 --(9)-->: state 23
state  183 --(;)-->: Dead state
state  183 --(<)-->: Dead state
state  183 --(=)-->: Dead state
state  183 --(>)-->: Dead state
state  183 --(A)-->: state 23
state  183 --(B)-->: state 23
state  183 --(C)-->: state 23
state  183 --(D)-->: state 23
state  183 --(E)-->: state 23
state  183 --(F)-->: state 23
state  183 --(G)-->: state 23
state  183 --(H)-->: state 23
state  183 --(I)-->: state 23
state  183 --(J)-->: state 23
state  183 --(K)-->: state 23
state  183 --(L)-->: state 23
state  183 --(M)-->: state 23
state  183 --(N)-->: state 23
state  183 --(O)-->: state 23
state  183 --(P)-->: state 23
state  183 --(Q)-->: state 23
state  183 --(R)-->: state 23
state  183 --(S)-->: state 23
state  183 --(T)-->: state 23
state  183 --(U)-->: state 23
state  183 --(V)-->: state 23
state  183 --(W)-->: state 23
state  183 --(X)-->: state 23
state  183 --(Y)-->: state 23
state  183 --(Z)-->: state 23
state  183 --(a)-->: state 23
state  183 --(b)-->: state 23
```

```
state  183 --(c)-->: state 23
state  183 --(d)-->: state 23
state  183 --(e)-->: state 23
state  183 --(f)-->: state 23
state  183 --(g)-->: state 23
state  183 --(h)-->: state 23
state  183 --(i)-->: state 23
state  183 --(j)-->: state 23
state  183 --(k)-->: state 23
state  183 --(l)-->: state 23
state  183 --(m)-->: state 23
state  183 --(n)-->: state 184
state  183 --(o)-->: state 23
state  183 --(p)-->: state 23
state  183 --(q)-->: state 23
state  183 --(r)-->: state 23
state  183 --(s)-->: state 23
state  183 --(t)-->: state 23
state  183 --(u)-->: state 23
state  183 --(v)-->: state 23
state  183 --(w)-->: state 23
state  183 --(x)-->: state 23
state  183 --(y)-->: state 23
state  183 --(z)-->: state 23
state  183 --({)-->: Dead state
state  183 --(})-->: Dead state
--------------------------------------------------------------------------------
state  184 --(!)-->: Dead state
state  184 --(()-->: Dead state
state  184 --())-->: Dead state
state  184 --(*)-->: Dead state
state  184 --(+)-->: Dead state
state  184 --(,)-->: Dead state
state  184 --(-)-->: Dead state
state  184 --(.)-->: Dead state
state  184 --(/)-->: Dead state
state  184 --(0)-->: state 23
state  184 --(1)-->: state 23
state  184 --(2)-->: state 23
state  184 --(3)-->: state 23
state  184 --(4)-->: state 23
state  184 --(5)-->: state 23
state  184 --(6)-->: state 23
state  184 --(7)-->: state 23
state  184 --(8)-->: state 23
state  184 --(9)-->: state 23
state  184 --(;)-->: Dead state
state  184 --(<)-->: Dead state
state  184 --(=)-->: Dead state
state  184 --(>)-->: Dead state
state  184 --(A)-->: state 23
state  184 --(B)-->: state 23
state  184 --(C)-->: state 23
state  184 --(D)-->: state 23
state  184 --(E)-->: state 23
state  184 --(F)-->: state 23
state  184 --(G)-->: state 23
state  184 --(H)-->: state 23
state  184 --(I)-->: state 23
state  184 --(J)-->: state 23
state  184 --(K)-->: state 23
state  184 --(L)-->: state 23
state  184 --(M)-->: state 23
state  184 --(N)-->: state 23
state  184 --(O)-->: state 23
state  184 --(P)-->: state 23
state  184 --(Q)-->: state 23
state  184 --(R)-->: state 23
state  184 --(S)-->: state 23
state  184 --(T)-->: state 23
state  184 --(U)-->: state 23
```

```
state  184 --(V)-->: state 23
state  184 --(W)-->: state 23
state  184 --(X)-->: state 23
state  184 --(Y)-->: state 23
state  184 --(Z)-->: state 23
state  184 --(a)-->: state 23
state  184 --(b)-->: state 23
state  184 --(c)-->: state 23
state  184 --(d)-->: state 23
state  184 --(e)-->: state 23
state  184 --(f)-->: state 23
state  184 --(g)-->: state 23
state  184 --(h)-->: state 23
state  184 --(i)-->: state 23
state  184 --(j)-->: state 23
state  184 --(k)-->: state 23
state  184 --(l)-->: state 23
state  184 --(m)-->: state 23
state  184 --(n)-->: state 23
state  184 --(o)-->: state 23
state  184 --(p)-->: state 23
state  184 --(q)-->: state 23
state  184 --(r)-->: state 23
state  184 --(s)-->: state 23
state  184 --(t)-->: state 23
state  184 --(u)-->: state 23
state  184 --(v)-->: state 23
state  184 --(w)-->: state 23
state  184 --(x)-->: state 23
state  184 --(y)-->: state 23
state  184 --(z)-->: state 23
state  184 --({)-->: Dead state
state  184 --(})-->: Dead state
----------------------------------------------------------------------------------------
```

d) <u>The resultant stream of tokens for the example test program.</u>

- The example test program

```
File    Edit    View

int sum , count , pass , mnt; while (pass !=
10)
{
pass = pass + 1 ;
}
```

- The stream of tokens

```
1   int
2   id
3   ,
4   id
5   ,
6   id
7   ,
8   id
9   ;
10  while
11  (
12  id
13  relop
14  num
15  )
16  {
17  id
18  assign
19  id
20  addop
21  num
22  ;
23  }
```

- **The values of the tokens:**

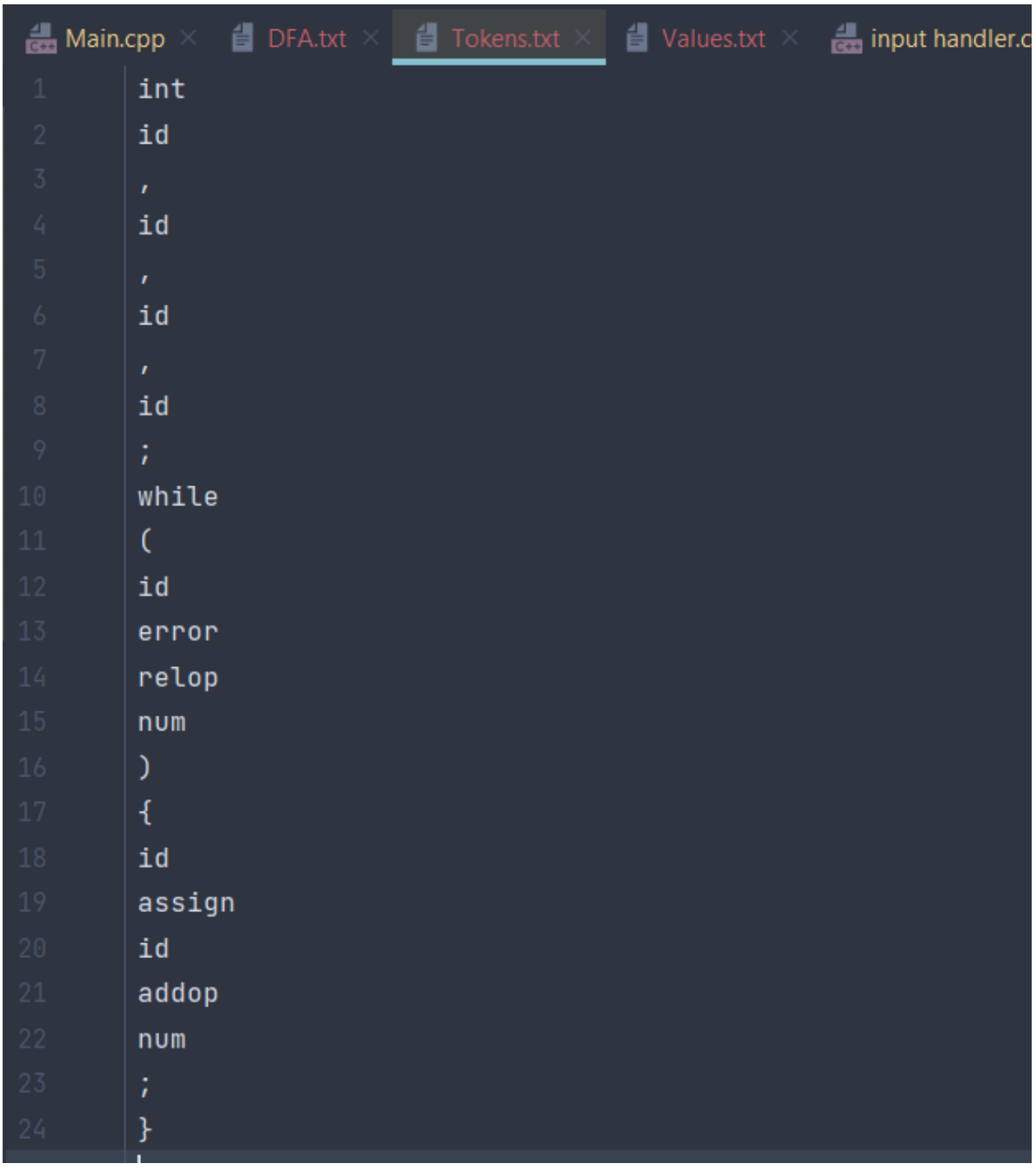
```
int
sum
,
count
,
pass
,
mnt
;
while
(
pass
!=
10
)
{
pass
=
pass
+
1
;
}
```

- An example of a test program with an error:

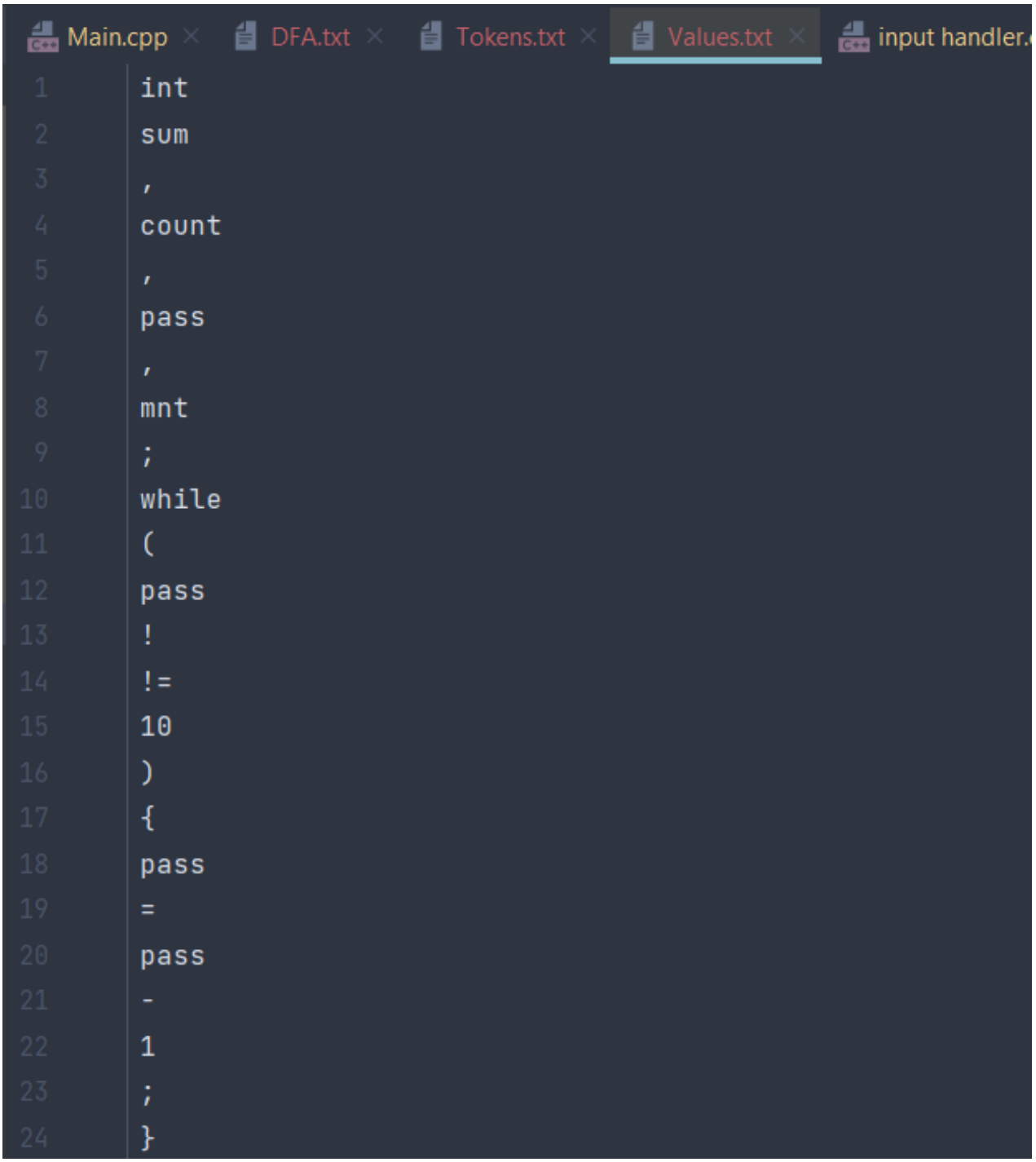
File Edit View

```
int sum , count , pass , mnt;
while (pass !!=
10)
{
pass = pass - 1 ;
}
```

- The stream of the tokens:



- **The values of the tokens:**



e) **Any assumptions made and their justification.**

- **Keywords must have spaces between them**

  Because if there are no spaces between them , we cannot indicate whether it's a keyword or not

- **Blanks between tokens are optional (zero or more blanks)**

  In programming languages like C++ or java , blanks between some tokens are optional like add operation between numbers (6+5) same as (6 + 5) and blanks between another some tokens are not optional like (5mohamed : error) but (5 mohamed : num and id) so because there is no indication in the lab for what we must do → we assume that the blanks are optional

- **Regular Expression must be defined before being used**

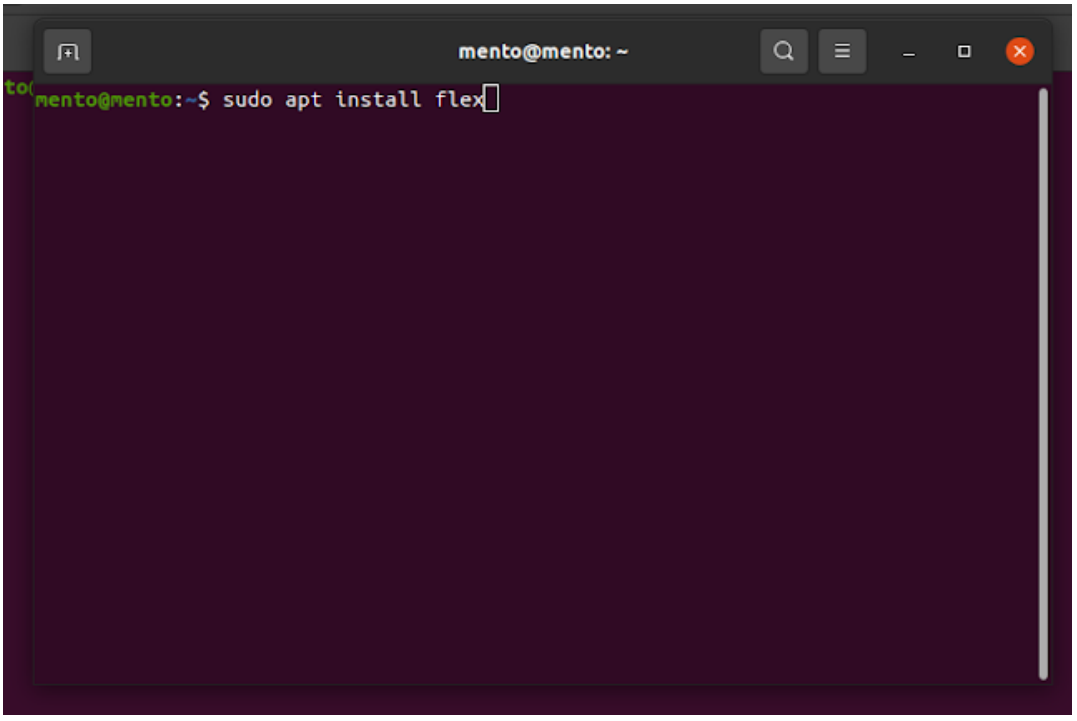
  Because if they are not defined we will traverse them (n power 2) times if they are in a reversed order

- **We don't have an actual dead state in DFA but we consider it in the implementation of the code when we have an invalid input**

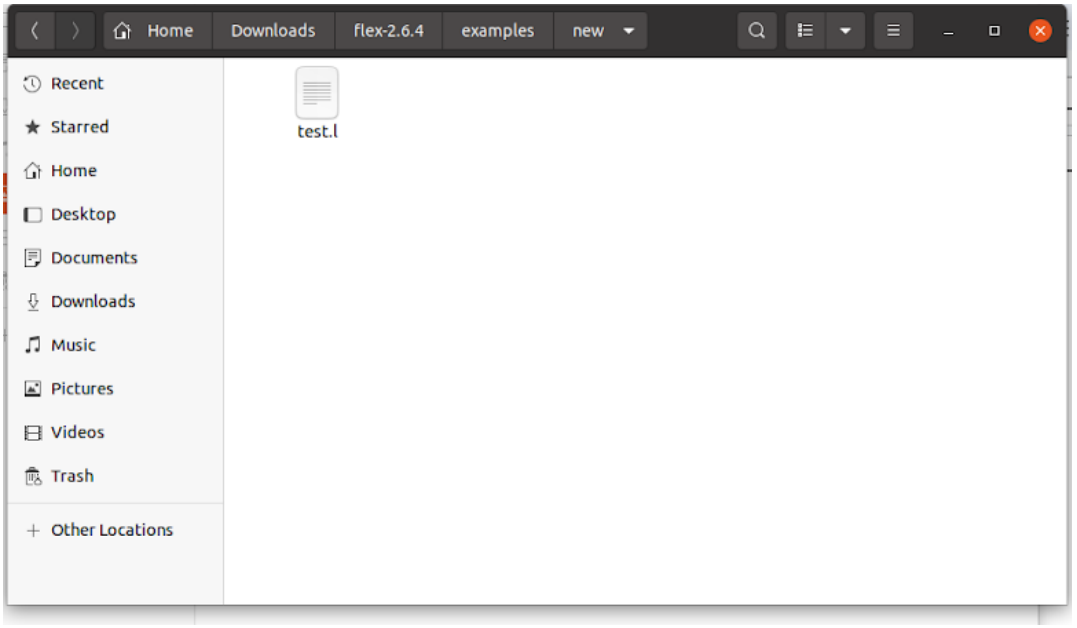
  So we cannot consume more storage for each dead state

- **Bouns:**

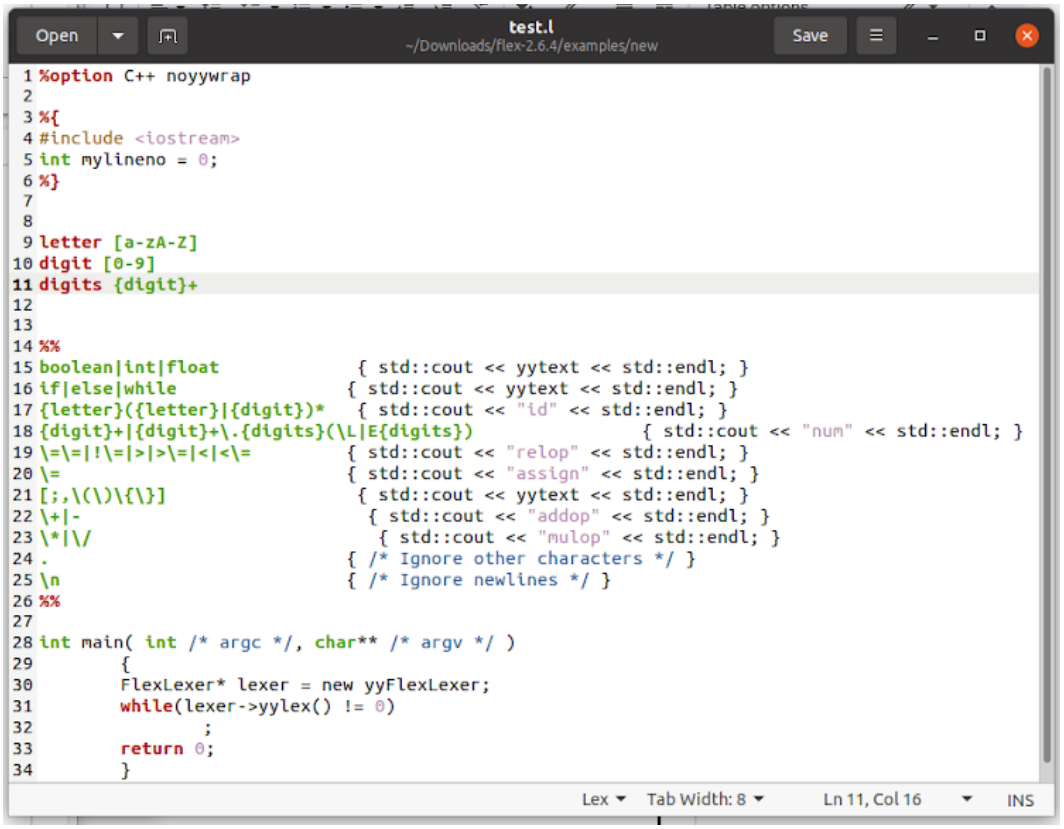
  - First we install flex by opening terminal and enter “sudo apt install flex”



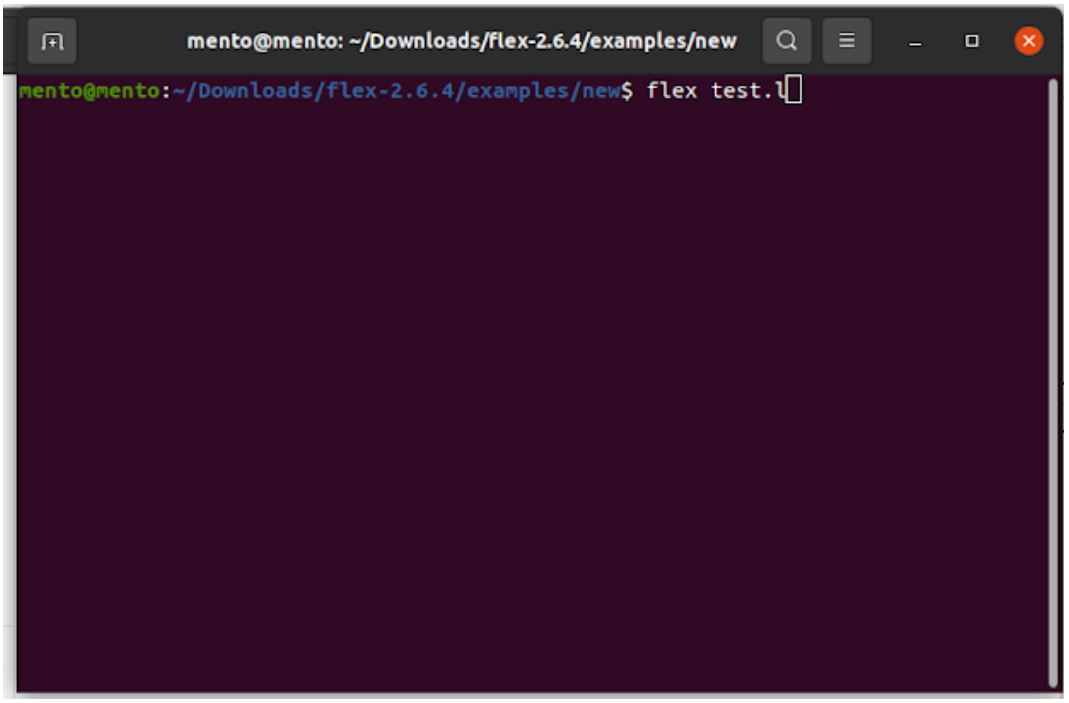
  - Then we create a new file



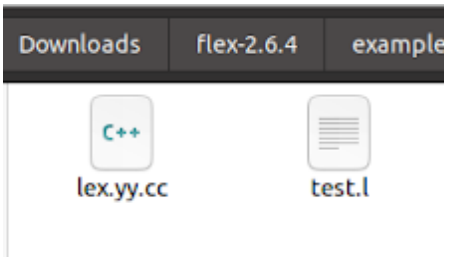
- Then we open it and write our grammar in a flex way and save it



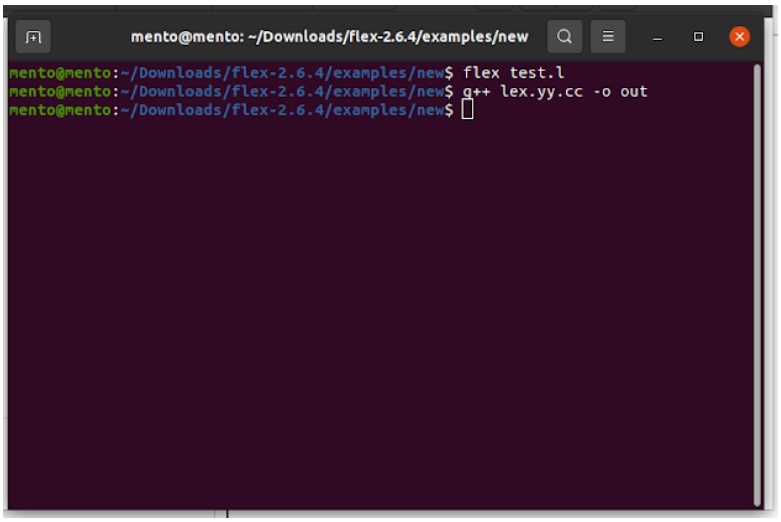
- Then we open terminal again and enter " flex {file name}"



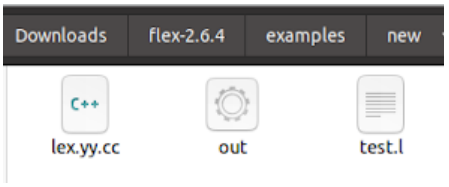
- Now we will find a new file called “lex.yy.cc”



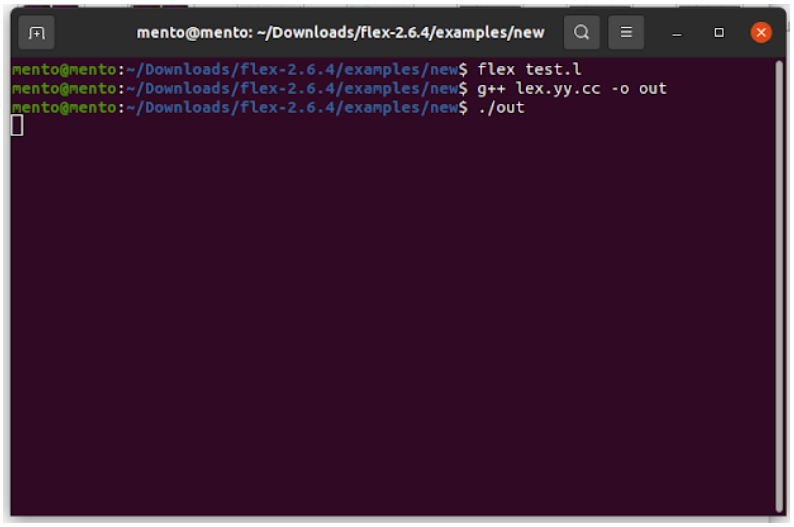
- Then return to terminal again and enter “g++ lex.yy.cc -o out”



- Now we will find a new file called “out”



- Finally we return to terminal again and enter “./out”



- Now we can type any input to test