# Assignment Description

Write a programming to store pairs of each state (two letter abbreviation) with a structure containing its long name, current Governor, and state flower in a map. At startup your program should read the abbreviations, long name, and governor's name for each state from a text file and store the values in a map. Your program should then prompt the user to enter a state's two-letter abbreviation and display the corresponding long name, Governor and flower for that state, looping until a sentinel value is entered. An appropriate non-fatal error message should be displayed for any invalid state abbreviation entered.

# 1 Readme Documentation

This program will prompt the user for a 2 letter state abbreviation. Then, if they’ve entered a valid abbreviation, they will receive information about the state’s full name, state flower, and governor. This will continue until the user inputs “0”

# 2 Flowchart Screen Shots

# 3 UML and Use Case Diagrams

# 4 Source Code of All files (.h, .cpp)

#include *<iostream>*

#include *<iomanip>*

#include *<string>*

#include *<cctype>*

#include *<stdexcept>*

#include *<vector>*

#include *<fstream>*

#include *<map>*

**using** **namespace** **std**;

*/\**

*Program Name: State Information*

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*Date Last Updated: 11/10/2024*

*Purpose:*

*Gets state abbreviation, name, flower, and governor from a text file*

*Then, prompts user for a state abbreviation and reads that state's info*

*\*/*

*// Struct to store state name, governor, and flower*

**struct** **stateType**{

string longName;

string governor;

string stateFlower;

};

map<string, stateType> getStates(string filename);

int main(){

map<string, stateType> states;

states = getStates("states.txt");

string userInput;

cout << "This program will give you information for every US state's state flower and governor." << endl;

bool running = true;

**while**(running){

cout << "Please enter the two-letter abbreviation for a US state. Enter 0 if you would like to exit: ";

*// Get user input for state abbreviation*

bool valid = false;

**while**(!valid){

**try**{

cin >> userInput;

*// Exits if user inputs 0*

**if**(userInput == string("0")){

valid = true;

running = false;

cout << endl << "Have a nice day!";

**break**;

}

*// Converts string to uppercase using itr pointer*

**for**(**auto** itr = userInput.begin(); itr != userInput.end(); itr++){

**if**(islower(\*itr)){

\*itr = toupper(\*itr);

}

}

*// Checks if user has entered an abbreviation in map*

bool keyNotInMap = states.find(userInput) == states.end();

**if**(keyNotInMap) **throw**(runtime\_error("Please enter a two-letter abbreviation for a US state. If you're finished, enter 0."));

valid = true;

}**catch**(**const** exception& e){

*// Prints error*

cerr << endl << e.what() << endl;

}

}

*// Skips printing state if user wants to exit*

**if**(userInput == string("0")) **break**;

cout << "Here is the information for the state you entered:" << endl;

cout << states[userInput].longName << ":" << endl;

cout << "Abbreviation: " << userInput << endl;

cout << "State Flower: " << states[userInput].stateFlower << endl;

cout << "State Governor: " << states[userInput].governor << endl << endl;

}

**return** 0;

}

map<string, stateType> getStates(string filename){

map<string, stateType> states;

ifstream inputFile;

**try**{

*// Automatically throws exception if there is an error reading file*

inputFile.exceptions(ifstream::badbit | ifstream::failbit);

inputFile.open(filename);

*// Read every line and add state info to map*

string line;

**while**(!inputFile.eof()){

*// Get line of file*

getline(inputFile, line);

*// Make stringstream from line*

stringstream s(line);

*// Get abbreviation (Everything before first comma)*

string abbreviation;

getline(s, abbreviation, ',');

*// Get state name (Everything before second comma)*

string stateName;

getline(s, stateName, ',');

*// Deleting whitespace*

stateName.erase(0,1);

*// Get state flower (Everything before third comma)*

string stateFlower;

getline(s, stateFlower, ',');

*// Deleting whitespace*

stateFlower.erase(0,1);

*// Get state governor (Everything before newline)*

string stateGovernor;

getline(s, stateGovernor, '\n');

*// Deleting whitespace*

stateGovernor.erase(0,1);

*// Create state struct*

stateType state;

state.longName = stateName;

state.stateFlower = stateFlower;

state.governor = stateGovernor;

*// Create key value pair*

states[abbreviation] = state;

}

}**catch**(**const** ifstream::failure& e){

*// If file failed to open, add error message and throw to main()*

**if**(!inputFile.is\_open()){

string errorMessage = "Error opening file '" + filename +"': " + e.what();

**throw** ifstream::failure(errorMessage);

}

*// If getline failed, skip line and keep going*

**else** **if**(inputFile.fail()){

cerr << "Error reading file contents: " << e.what() << endl;

cerr << "Skipping line and continuing..." << endl;

inputFile.clear();

inputFile.ignore(10000, '\n');

}

}

*// Close file*

**if**(inputFile.is\_open()){

inputFile.close();

}

**return** states;

}

# List of State information:

AL, Alabama, Camellia, Kay Ivey

AK, Alaska, Forget-Me-Not, Mike Dunleavy

AZ, Arizona, Saguaro Cactus Blossom, Katie Hobbs

AR, Arkansas, Apple Blossom, Sarah Huckabee Sanders

CA, California, California Poppy, Gavin Newsom

CO, Colorado, Colorado Blue Columbine, Jared Polis

CT, Connecticut, Mountain Laurel, Ned Lamont

DE, Delaware, Peach Blossom, John Carney

FL, Florida, Orange Blossom, Ron DeSantis

GA, Georgia, Cherokee Rose, Brian Kemp

HI, Hawaii, Hawaiian Hibiscus, Josh Green

ID, Idaho, Syringa (Mock Orange), Brad Little

IL, Illinois, Violet, J.B. Pritzker

IN, Indiana, Peony, Eric Holcomb

IA, Iowa, Wild Rose, Kim Reynolds

KS, Kansas, Sunflower, Laura Kelly

KY, Kentucky, Goldenrod, Andy Beshear

LA, Louisiana, Magnolia, John Bel Edwards

ME, Maine, White Pine Cone and Tassel, Janet Mills

MD, Maryland, Black-Eyed Susan, Wes Moore

MA, Massachusetts, Mayflower, Maura Healey

MI, Michigan, Apple Blossom, Gretchen Whitmer

MN, Minnesota, Lady's Slipper, Tim Walz

MS, Mississippi, Magnolia, Tate Reeves

MO, Missouri, Hawthorn, Mike Parson

MT, Montana, Bitterroot, Greg Gianforte

NE, Nebraska, Goldenrod, Jim Pillen

NV, Nevada, Sagebrush, Joe Lombardo

NH, New Hampshire, Purple Lilac, Maggie Hassan

NJ, New Jersey, Purple Violet, Phil Murphy

NM, New Mexico, Yucca Flower, Michelle Lujan Grisham

NY, New York, Rose, Kathy Hochul

NC, North Carolina, Dogwood, Roy Cooper

ND, North Dakota, Wild Prairie Rose, Doug Burgum

OH, Ohio, Red Carnation, Mike DeWine

OK, Oklahoma, Oklahoma Rose, Kevin Stitt

OR, Oregon, Oregon Grape, Tina Kotek

PA, Pennsylvania, Mountain Laurel, Josh Shapiro

RI, Rhode Island, Violet, Dan McKee

SC, South Carolina, Yellow Jessamine, Henry McMaster

SD, South Dakota, American Pasqueflower, Kristi Noem

TN, Tennessee, Iris, Bill Lee

TX, Texas, Bluebonnet, Greg Abbott

UT, Utah, Sego Lily, Spencer Cox

VT, Vermont, Red Clover, Phil Scott

VA, Virginia, American Dogwood, Glenn Youngkin

WA, Washington, Coast Red Cedar, Jay Inslee

WV, West Virginia, Rhododendron, Jim Justice

WI, Wisconsin, Wood Violet, Tony Evers

WY, Wyoming, Indian Paintbrush, Mark Gordon

# 5 Three Use Case Screen Shots





