

## **Zip Code Group Project 3.0 Final Test Document**

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**Team 1 Members:** Tristan Adams, Kent Biernath, Andrew Clayton, Emma Hoffmann

### **Overview**

The test document for Zip Code Group Project 3.0 outlines the specific test objectives and scenarios that will be conducted to ensure the accuracy, functionality, and performance of the application and all programs. This project progresses from Zip Code Group Projects 1.0 and 2.0, building upon their functionalities while introducing new capabilities. Project 3.0 entails the development of a C++ application involving efficient ZIP code data management. The primary focus of this testing phase is to validate the application's ability to accurately convert and manage data, transitioning from standard formats to a structured, advanced file system. The testing phase is crucial to verify that the application operates as expected and maintains data integrity. This document will describe the test objectives, test cases, and expected results, covering a range of scenarios to validate the application's functionality and robustness.

### **Test Objectives**

The primary objectives of testing for Zip Code Group Project 3.0 are as follows:

1. CSV Conversion and Data File Structure Testing:
  - a. Verify the application's ability to generate CSV files from XLSX files.
  - b. Confirm accurate conversion of CSV files into a structured file format with length-indicated records and a header record.
2. Blocked Sequence Set File Generation and Handling:
  - a. Evaluate the creation of blocked sequence set files from Project 2.0 data files.
  - b. Validate command line options for file specification and header information.
  - c. Ensure uniform block size and complete record sets, including metadata management.
3. Buffer Class Functionality and File Processing:
  - a. Test the block and record buffer classes for unpacking records and fields.
  - b. Confirm modifications to the header record buffer class for new file formats.
  - c. Verify processing of blocked sequence set files, integrating functionality from Projects 1.0 and 2.0.
4. Dump Methods and Index File Testing:
  - a. Assess dump methods for visualizing Zip Codes in blocks with RBN links.
  - b. Test both physical and logical block ordering methods.
  - c. Verify the creation and accuracy of index files and their dumps.
5. Search Functionality and Index Testing:
  - a. Test Zip Code record search using command line flags.

- b. Confirm accuracy of search functionality with primary key index.
- 6. Record Management Testing:
  - a. Validate addition and deletion of records in sequence sets and index.
  - b. Test scenarios for block splits, merges, and redistributions.
- 7. Performance and Data Integrity:
  - a. Assess application performance with data sets for efficiency and responsiveness.
  - b. Validate data integrity across all applications ensuring no loss or corruption during data handling and processing.
- 8. Edge Cases and Error Handling:
  - a. Test edge cases to verify that the application handles uncommon scenarios and inputs effectively.
  - b. Assess error handling mechanisms to provide user-friendly feedback for unexpected data inputs.

These test objectives are designed to evaluate the Zip Code Group Project 3.0 application to ensure that it operates accurately, consistently, and efficiently. The test cases and scenarios will be used to validate these objectives.

1. Input file: us\_postal\_codes.csv

Zipcode searched: 56301

**Expected:** Should return zip code information.

2. Input file: us\_postal\_codes.csv

Zipcode searched: 9999

**Expected:** Should return not found.

3. Input file: us\_postal\_codes\_rand.csv

Zipcode searched: 9999

**Expected:** Should return not found.

4. Input file: us\_postal\_codes\_rand.csv

Zipcode searched: 56301

**Expected:** Should return zip code information.

5. Input file: us\_postal\_codes\_rand.csv

Zipcode searched: 56301, 56303, 55379

**Expected:** Should return zip code information for all 3 codes.

6. Input file: us\_postal\_codes\_rand.csv

Zipcode searched: 56303, 55379, 11111

**Expected:** Should return zip code information for 2 and not found for 1.

7. Input file: us\_postal\_codes\_blocked.txt

Zipcode searched: 56301

**Expected:** Should return zip code information.

7. Input file: us\_postal\_codes\_blocked.txt

Zipcode searched: 9999

**Expected:** Should return not found.

7. Input file: us\_postal\_codes\_blocked.txt

Zipcode searched: 56301, 61072

**Expected:** Should return zip code information for both codes.

7. Input file: us\_postal\_codes\_blocked.txt

Zipcode searched: 56301, 61072, 9999

**Expected:** Should return information for the first two codes, and not found for the third.

**Commented [CM1]:** 7 is where the project 3 specific tests are run. I figure if the program is still capable of all of these, the older ones remain present on the doc.

```
lf4262is@csci4:~/GroupProject2
[lf4262is@csci4:~/GroupProject2]$ ./ZipCode.exe
Enter the file name to open: us_postal_codes_rand.txt
File successfully opened.
State  East   West   North  South
-----
AA      34034  34034  34034  34034
AK      99546  99923  99723  99546
AL      36584  36856  35739  36547
AP      96373  96507  96507  96373
AR      72747  72310  72733  71749
AZ      85349  86508  86021  85620
CA      95536  92267  95567  92173
CO      81411  81047  81653  81138
CT      6831   6243   6079   6836
DC      20016  20019  20012  20375
DE      19716  19944  19810  19975
FL      32568  33480  32452  33040
FM      96941  96941  96941  96941
GA      30752  31328  30751  31562
HI      96769  96898  96722  96772
IA      51001  52734  52160  52632
ID      83844  83238  83826  83237
IL      62379  60438  60075  62914
IN      47631  47003  46530  47635
```

```
lf4262is@csci4:~/GroupProject2
[lf4262is@csci4 GroupProject2]$ ./ZipCode.exe -Z 55448
Enter the file name to open: us_postal_codes.csv
File successfully opened.
Zip Code: 55448
Place Name: Minneapolis
State: MN
County: Anoka
Latitude: 45.1907 Longitude: -93.3021

[lf4262is@csci4 GroupProject2]$ ./ZipCode.exe -Z 99999
Enter the file name to open: us_postal_codes.txt
File successfully opened.
No record of 99999

[lf4262is@csci4 GroupProject2]$ ./ZipCode.exe -Z 56301 -Z 55092 --zipcode 85085
Enter the file name to open: us_postal_codes_rand.txt
File successfully opened.
Zip Code: 56301
Place Name: Saint Cloud
State: MN
County: Stearns
Latitude: 45.541 Longitude: -94.1819
Zip Code: 55092
```

7.

```
Suggestion [3,General]: The command us_postal_codes_blocked.txt was not found, but does exist in the current locat
instead type: ".\us_postal_codes_blocked.txt". See "get-help about_Command_Precedence" for more details.
PS C:\Users\trist\Desktop\future version\Project-3-group-1> ./ZipCode.exe -Z56301
Enter the file name to open: us_postal_codes_blocked.txt
File successfully opened.
Information for zipcode 56301:
Zipcode: 56301
Town: Saint Cloud
State: MN
County: Stearns
Latitude: 45.541
Longitude: -94.1819

PS C:\Users\trist\Desktop\future version\Project-3-group-1>

PS C:\Users\trist\Desktop\future version\Project-3-group-1> ./ZipCode.exe -Z9999
Enter the file name to open: us_postal_codes_blocked.txt
File successfully opened.
Zipcode 9999 not found.

PS C:\Users\trist\Desktop\future version\Project-3-group-1>

PS C:\Users\trist\Desktop\future version\Project-3-group-1> ./ZipCode.exe -Z56301 -Z61072
Enter the file name to open: us_postal_codes_blocked.txt
File successfully opened.
Information for zipcode 56301:
Zipcode: 56301
Town: Saint Cloud
State: MN
County: Stearns
Latitude: 45.541
Longitude: -94.1819

Information for zipcode 61072:
Zipcode: 61072
Town: Rockton
State: IL
County: Winnebago
Latitude: 42.4544
Longitude: -89.0887
```

```
PS C:\Users\trist\Desktop\future version\Project-3-group-1-> ./ZipCode.exe -Z56301 -Z61072 -Z9999
Enter the file name to open: us_postal_codes_blocked.txt
File successfully opened.
Information for zipcode 56301:
Zipcode: 56301
Town: Saint Cloud
State: MN
County: Stearns
Latitude: 45.541
Longitude: -94.1819

Information for zipcode 61072:
Zipcode: 61072
Town: Rockton
State: IL
County: Winnebago
Latitude: 42.4544
Longitude: -89.0887

Zipcode 9999 not found.

PS C:\Users\trist\Desktop\future version\Project-3-group-1-> |
```

```

H42621s@csc14 ~/GroupProject2
OR 97465 97842 97121 97635
PA 16155 10336 16420 19351
PW 96940 96940 96940 96940
RI 2891 2837 2824 2807
SC 29658 29566 29356 29915
SD 57724 57060 57645 57049
TN 38109 37680 37119 37396
TX 79821 75932 79051 78522
UT 84083 84534 84331 84784
VA 24248 23336 22625 24580
VT 5734 5902 5902 5352
WA 98350 99402 98231 98671
WI 54082 54246 54850 53102
WV 25555 25425 26050 24884
WY 83120 82082 82423 82321

(lf42621s@csc14 GroupProject2)$ ./ZipCode.exe -Z 55448
Enter the file name to open: us_postal_codes.csv
File successfully opened.
Zip Code: 55448
Place Name: Minneapolis
State: MN
County: Anoka
Latitude: 45.1907 Longitude: -93.3021

(lf42621s@csc14 GroupProject2)$ ./ZipCode.exe -Z 99999
Enter the file name to open: us_postal_codes.txt
File successfully opened.
No record of 99999

(lf42621s@csc14 GroupProject2)$ ./ZipCode.exe -Z 56301 -Z 55092 --zipcode 85085
Enter the file name to open: us_postal_codes_rand.txt
File successfully opened.
Zip Code: 56301
Place Name: Saint Cloud
State: MN
County: Stearns
Latitude: 45.541 Longitude: -94.1019

Zip Code: 55092
Place Name: Wyoming
State: MN
County: Chisago
Latitude: 45.3364 Longitude: -92.9675

Zip Code: 85085
Place Name: Phoenix
State: AZ
County: Maricopa
Latitude: 33.7529 Longitude: -112.089

(lf42621s@csc14 GroupProject2)$ exit
exit
Script done, file is typescript
(lf42621s@csc14 GroupProject2)$ ./ZipCode.exe
Enter the file name to open: ^C
(lf42621s@csc14 GroupProject2)$ ./ZipCode.exe -Z 55092
Enter the file name to open: us_postal_codes_rand.csv
File successfully opened.
Zip Code: 55092
Place Name: Wyoming
State: MN
County: Chisago
Latitude: 45.3364 Longitude: -92.9675

(lf42621s@csc14 GroupProject2)$

```

```
andrew@AC2002L23:/mnt/c/Users/andre/OneDrive/Documents/GitHub/Project-3-group-1-$ ./ZipCode.exe -z56301
Enter the file name to open: us_postal_codes_blocked.txt
File successfully opened.
Information for zipcode 56301:
Zipcode: 56301
Town: Saint Cloud
State: MN
County: Stearns
Latitude: 45.541
Longitude: -94.1819

andrew@AC2002L23:/mnt/c/Users/andre/OneDrive/Documents/GitHub/Project-3-group-1-$ ./ZipCode.exe -z9999
Enter the file name to open: us_postal_codes_blocked.txt
File successfully opened.
Zipcode 9999 not found.

andrew@AC2002L23:/mnt/c/Users/andre/OneDrive/Documents/GitHub/Project-3-group-1-$ ./ZipCode.exe -z56301 -z61072
Enter the file name to open: us_postal_codes_blocked.txt
File successfully opened.
Information for zipcode 56301:
Zipcode: 56301
Town: Saint Cloud
State: MN
County: Stearns
Latitude: 45.541
Longitude: -94.1819

Information for zipcode 61072:
Zipcode: 61072
Town: Rockton
State: IL
County: Winnebago
Latitude: 42.4544
Longitude: -89.0887

andrew@AC2002L23:/mnt/c/Users/andre/OneDrive/Documents/GitHub/Project-3-group-1-$ ./ZipCode.exe -z56301 -z61072 -z9999
Enter the file name to open: us_postal_codes_blocked.txt
File successfully opened.
Information for zipcode 56301:
Zipcode: 56301
Town: Saint Cloud
State: MN
County: Stearns
Latitude: 45.541
Longitude: -94.1819

Information for zipcode 61072:
Zipcode: 61072
Town: Rockton
State: IL
County: Winnebago
Latitude: 42.4544
Longitude: -89.0887

Zipcode 9999 not found.
```