|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 1 | Check the validity of data as a boolean type. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | Boolean Validator.IsBoolean(String field, out Boolean aBoolean) | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 1.1 | field = true  aBoolean N/A  [1] | expectedReturn = true no error messages |  |  |  |
| 1.2 | field = uppercase  aBoolean N/A  [2] | expectedReturn = false  error message = [3] |  |  |  |

**Data References**

1. File: Test1.cfg (Appendix A)  
   Data:  
   CROZZLE-OUTPUT  
    UPPERCASE=true  
   END-CROZZLE-OUTPUT
2. File: Test3.cfg (Appendix G)  
   Data:  
   CROZZLE-OUTPUT  
    UPPERCASE=uppercase  
   END-CROZZLE-OUTPUT
3. error 1: code 1001: key-value pair (UPPERCASE=uppercase), value is not matching the pattern ^(true|false)$

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 2 | Check the validity of data as an Int32 type. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | Boolean Validator.IsInt32(String field, out int anInteger) | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 2.1 | field = 10  anInteger N/A  [1] | expectedResult = true no error message |  |  |  |
| 2.2 | field = 1 anInteger N/A  [2] | expectedResult = true no error message |  |  |  |
| 2.3 | field = y  anInteger N/A  [3] | expectedResult = false error message = [4] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.czl (Appendix C)  
   Data:

CROZZLE-SIZE

SIZE=10,15

END-CROZZLE-SIZE

1. Test Files/New Test Files/Test2.czl (Appendix F)   
   Data:

CROZZLE-SIZE

SIZE=1,15

END-CROZZLE-SIZE

1. Test Files/New Test Files/Test3.czl (Appendix I)   
   Data:

CROZZLE-SIZE

SIZE=y,10

END-CROZZLE-SIZE

1. error 1: code 4006: the value (y) in the key-value (SIZE=y,10) is not an integer.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 3 | Check the validity of data as a hex colour code formatted data entry. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | Boolean Validator.IsHexColourCode(String hexColour) | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 3.1 | hexColour = #777777  [1] | expectedResult = true |  |  |  |
| 3.2 | hexColour = #777  [2] | expectedResult = true |  |  |  |
| 3.3 | hexColour = 777777  [3] | expectedResult = false |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.cfg (Appendix A)
2. Test Files/New Test Files/Test2.cfg (Appendix D)
3. Test Files/New Test Files/Test3.cfg (Appendix G)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 4 | Check validity of a KeyValue entry. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | Boolean KeyValue.TryParse(String originalKeyValueData, String keyPattern, out KeyValue aKeyValue) | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 4.1 | [1] | expectedResult = no issue  no error message |  |  |  |
| 4.2 | [2]  [3] | expectedResult = [5]  no error message |  |  |  |
| 4.3 | [4] | expectedResult = [6] error messages = [7] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.cfg (Appendix A)
2. Test Files/New Test Files/Test2.cfg (Appendix D)
3. INTERSECTING POINTS  
   …  
    Z=64  
    Z=65  
   END-INTERSECTING-POINTS
4. Test Files/New Test Files/Test3.cfg (Appendix G)
5. Duplicate KeyValue within file will overwrite the first instance of the KeyValue with new data.
6. File contains multiple illegal and invalid characters and incomplete entries which cannot be parsed, return false.
7. error 1: code 6004: missing value in key-value pair (B=)  
   error 2: code 6005: missing = symbol in key-value pair (C)  
   error 3: code 6005: missing = symbol in key-value pair (2)  
   error 4: code 1001: key-value pair (D=XXXX), value is not an integer

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 5 | Check the scoring and handling of valid and invalid Crozzles. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | String Crozzle.Score() | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 5.1 | [1] | expectedResult = 192 |  |  |  |
| 5.2 | [2] | expectedResult = [4] |  |  |  |
| 5.3 | [3] | expectedResult = [5] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.cfg, Test Files/New Test Files/Test1.seq, Test Files/New Test Files/Test1.czl  
   Appendix A, Appendix B, Appendix C
2. Test Files/New Test Files/Test2.cfg, Test Files/New Test Files/Test2.seq, Test Files/New Test Files/Test2.czl  
   Appendix D, Appendix E, Appendix F
3. Test Files/New Test Files/Test3.cfg, Test Files/New Test Files/Test3.seq, Test Files/New Test Files/Test3.czl  
   Appendix G, Appendix H, Appendix I
4. INVALID CROZZLE
5. Crozzle with missing data cannot be validated

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 6 | Check for duplicate words within valid and invalid data files. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | void CrozzleSequences.CheckDuplicateWords(int lowerLimit, int upperLimit) | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 6.1 | lowerLimit = 0 upperLimit = 0  [1] | no duplicates found  no error message |  |  |  |
| 6.2 | lowerLimit = 0 upperLimit = 1  [2] | duplicates found  error message = [4] |  |  |  |
| 6.3 | lowerLimit = 0 upperLimit = 0  [3] | expectedResult = [5] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.cfg, Test Files/New Test Files/Test1.seq, Test Files/New Test Files/Test1.czl  
   Appendix A, Appendix B, Appendix C
2. Test Files/New Test Files/Test2.cfg, Test Files/New Test Files/Test2.seq, Test Files/New Test Files/Test2.czl  
   Appendix D, Appendix E, Appendix F
3. Test Files/New Test Files/Test3.cfg, Test Files/New Test Files/Test3.seq, Test Files/New Test Files/Test3.czl  
   Appendix G, Appendix H, Appendix I
4. error 2: code 11002: the number of horizontal words intersecting WENDY is 1, but this is not within [2, 500]  
   error 3: code 11003: the number of times AL occurs is 2, but this is not within [1, 1]  
   error 4: code 11003: the number of times ROSE occurs is 3, but this is not within [1, 1]  
   error 5: code 11003: the number of times RON occurs is 2, but this is not within [1, 1]
5. CheckDuplicateWords() never run, Crozzle with missing data cannot be validated

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 7 | Check the validity of a Crozzle from input provided. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | void Crozzle.Validate() | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 7.1 | [1] | expectedResult = [4] |  |  |  |
| 7.2 | [2] | expectedResult = [5] |  |  |  |
| 7.3 | [3] | expectedResult = [6] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.cfg, Test Files/New Test Files/Test1.seq, Test Files/New Test Files/Test1.czl  
   Appendix A, Appendix B, Appendix C
2. Test Files/New Test Files/Test2.cfg, Test Files/New Test Files/Test2.seq, Test Files/New Test Files/Test2.czl  
   Appendix D, Appendix E, Appendix F
3. Test Files/New Test Files/Test3.cfg, Test Files/New Test Files/Test3.seq, Test Files/New Test Files/Test3.czl  
   Appendix G, Appendix H, Appendix I
4. Validate the Crozzle, print Score = 192.
5. Invalidate the Crozzle, print Score = INVALID CROZZLE.
6. Crozzle cannot be validated with incomplete data.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 8 | Check the HTML generation and output for the provided Crozzle. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | String Crozzle.ToStringHTML() | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 8.1 | [1] | expectedResult = [4]  no error message |  |  |  |
| 8.2 | [2] | expetedResult = [5]  no error message |  |  |  |
| 8.3 | [3] | expectedResult = [6] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.cfg (Appendix A), Test Files/New Test Files/Test1.czl (Appendix C)
2. Test Files/New Test Files/Test2.cfg (Appendix D), Test Files/New Test Files/Test2.czl (Appendix F)
3. Test Files/New Test Files/Test3.cfg (Appendix G), Test Files/New Test Files/Test3.czl (Appendix I)
4. HTML Output Appendix J
5. HTML Output Appendix K
6. Cannot create valid HTML output for a Crozzle with missing data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 9 | Calculate the number of separated word groups within a Crozzle. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | Int CrozzleMap.GroupCount() | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 9.1 | [1] | count = 1  no error message |  |  |  |
| 9.2 | [2] | count = 4  error message = [4] |  |  |  |
| 9.3 | [3] | count = [5] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.czl (Appendix C)
2. Test Files/New Test Files/Test2.czl (Appendix F)
3. Test Files/New Test Files/Test3.czl (Appendix I)
4. error 6: code 11005: the number of groups of connected words is 4, but this is not within [1, 1]
5. Count cannot be performed on a Crozzle with incomplete data.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 10 | Check the validity of a configuration file. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | Boolean Configuration.TryParse(String path, out Configuration aConfiguration) | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 10.1 | [1] | expectedResult = true  no error message |  |  |  |
| 10.2 | [2] | expectedResult = true  no error message |  |  |  |
| 10.3 | [3] | expectedResult = false  error message = [4] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.cfg (Appendix A)
2. Test Files/New Test Files/Test2.cfg (Appendix D)
3. Test Files/New Test Files/Test3.cfg (Appendix G)
4. error 1: code 1001: key-value pair (UPPERCASE=uppercase), value is not matching the pattern ^(true|false)$  
   error 2: code 1004: key-value pair (BGCOLOUR\_EMPTY\_TD=777777), colour is not a Hex colour code  
   error 3: code 1004: key-value pair (BGCOLOUR\_NON\_EMPTY\_TD=#), colour is not a Hex colour code  
   error 4: code 6004: missing value in key-value pair (B=)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 11 | Check the validity of a word list file. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | Boolean WordList.TryParse(String path, Configuration aConfiguration, out WordList aWordList) | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 11.1 | [1] | expectedResult = true  no error message |  |  |  |
| 11.2 | [2] | expectedResult = true  error message = [4] |  |  |  |
| 11.3 | [3] | expectedResult = false  error message = [5] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.seq (Appendix B)
2. Test Files/New Test Files/Test2.seq (Appendix E)
3. Test Files/New Test Files/Test3.seq (Appendix H)
4. error 1: code 10005: ASCII value (603) is incorrect for sequence value (JOHNATHON)
5. error 1: code 10001: non-alphabetic value (ANGELA\*) in the wordlist sequence column  
   error 2: code 10002: missing word in row 4 of the wordlist

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Description** | | | | |
| 12 | Check the validity of a Crozzle file. | | | | |
| **Test Method** | **Method Tested** | | | | |
|  | Boolean Crozzle.TryParse(String path, Configuration aConfiguration, WordList wordList, out Crozzle aCrozzle) | | | | |
| **Test Case ID** | **Parameters** | **Expected Data** | **Actual Data** | **Test Result** | **Test Comments** |
| 12.1 | [1] | expectedResult = true  no error message |  |  |  |
| 12.2 | [2] | expectedResult = true  no error message |  |  |  |
| 12.3 | [3] | expectedResult = false  error message = [4] |  |  |  |

**Data References**

1. Test Files/New Test Files/Test1.czl (Appendix C)
2. Test Files/New Test Files/Test2.czl (Appendix F)
3. Test Files/New Test Files/Test3.czl (Appendix I)
4. error 1: code 3002: value (aaa) is not an integer  
   error 2: code 3001: value (bbb) is not an integer  
   error 3: code 3002: column value (2) is not in the range 1 to 0, inclusive

# Appendix A – Test1.cfg

// Log File Configurations.

LOGFILE

// The default log file name.

DEFAULT="log.txt"

END-LOGFILE

// Letter Sequences Configurations.

// Limits on the number of unique letter sequences in the sequecnes file.

SEQUENCES-IN-FILE

MINIMUM=5

MAXIMUM=500

END-SEQUENCES-IN-FILE

// Crozzle Output Configurations.

CROZZLE-OUTPUT

INVALID-CROZZLE-SCORE="INVALID CROZZLE"

UPPERCASE=true

STYLE="<style> table, td { border: 1px solid black; border-collapse: collapse; } td { width:24px; height:18px; text-align: center; } </style>"

BGCOLOUR-EMPTY-TD=#777777

BGCOLOUR-NON-EMPTY-TD=#ffffff

END-CROZZLE-OUTPUT

// Crozzle Configurations.

// Limits on the size of the crozzle grid.

CROZZLE-SIZE

MINIMUM-ROWS=5

MAXIMUM-ROWS=500

MINIMUM-COLUMNS=5

MAXIMUM-COLUMNS=500

END-CROZZLE-SIZE

// Limits on the number of horizontal letter sequences and

// vertical letter sequences in a crozzle.

SEQUENCES-IN-CROZZLE

MINIMUM-HORIZONTAL=1

MAXIMUM-HORIZONTAL=200

MINIMUM-VERTICAL=1

MAXIMUM-VERTICAL=200

END-SEQUENCES-IN-CROZZLE

// Limits on the number of

// intersecting vertical sequences for each horizontal sequences, and

// intersecting horizontal sequences for each vertical sequences.

INTERSECTIONS-IN-SEQUENCES

MINIMUM-HORIZONTAL=1

MAXIMUM-HORIZONTAL=500

MINIMUM-VERTICAL=1

MAXIMUM-VERTICAL=500

END-INTERSECTIONS-IN-SEQUENCES

// Limits on duplicate letter sequences in the crozzle.

DUPLICATE-SEQUENCES

MINIMUM=0

MAXIMUM=0

END-DUPLICATE-SEQUENCES

// Limits on the number of valid groups.

VALID-GROUPS

MINIMUM=1

MAXIMUM=1

END-VALID-GROUPS

// Scoring Configurations

// Points per letter that is at the intersection of

// a horizontal and vertical sequence within the crozzle.

INTERSECTING-POINTS

A=1

B=2

C=2

D=2

E=1

F=2

G=2

H=2

I=1

J=4

K=4

L=4

M=4

N=4

O=1

P=8

Q=8

R=8

S=8

T=8

U=1

V=16

W=16

X=32

Y=32

Z=64

END-INTERSECTING-POINTS

// Points per letter that is not at the intersection of

// a horizontal and vertical sequence within the crozzle.

NON-INTERSECTING-POINTS

A=0

B=0

C=0

D=0

E=0

F=0

G=0

H=0

I=0

J=0

K=0

L=0

M=0

N=0

O=0

P=0

Q=0

R=0

S=0

T=0

U=0

V=0

W=0

X=0

Y=0

Z=0

END-NON-INTERSECTING-POINTS

# Appendix B – Test1.seq

"[a-zA-Z]{2,}",310,153,11504,11967

AL,10,2,141,153

ALAN,10,4,284,298

ANGELA,10,6,424,440

BETTY,10,5,392,407

BILL,10,4,291,305

BRENDA,10,6,428,444

CHARLES,10,7,514,531

FRED,10,4,289,303

GARY,10,4,307,321

GEORGE,10,6,441,457

GRAHAM,10,6,432,448

HARRY,10,5,390,405

JACK,10,4,281,295

JESSICA,10,7,514,531

JILL,10,4,299,313

JOHNATHON,10,9,681,700

LARRY,10,5,394,409

MARK,10,4,299,313

MARY,10,4,313,327

MATTHEW,10,7,538,555

OSCAR,10,5,376,391

PAM,10,3,222,235

PETER,10,5,384,399

ROBERT,10,6,462,478

ROGER,10,5,383,398

RON,10,3,239,252

RONALD,10,6,448,464

ROSE,10,4,313,327

SUSAN,10,5,394,409

TOM,10,3,240,253

WENDY,10,5,391,406

# Appendix C – Test1.czl

// File dependencies.

FILE-DEPENDENCIES

CONFIG-DATA=".\Test1.cfg"

SEQUENCE-DATA=".\Test1.seq"

END-FILE-DEPENDENCIES

// Crozzle Size. The number of rows and columns.

// This crozzle will have 10 rows and 15 columns.

CROZZLE-SIZE

SIZE=10,15

END-CROZZLE-SIZE

// Horizontal Sequence Data.

HORIZONTAL-SEQUENCES

SEQUENCE=PETER,LOCATION=1,1

SEQUENCE=RONALD,LOCATION=1,10

SEQUENCE=MARK,LOCATION=3,1

SEQUENCE=GRAHAM,LOCATION=3,10

SEQUENCE=BRENDA,LOCATION=5,3

SEQUENCE=FRED,LOCATION=5,12

SEQUENCE=LARRY,LOCATION=7,9

SEQUENCE=BETTY,LOCATION=8,1

SEQUENCE=RON,LOCATION=9,7

SEQUENCE=SUSAN,LOCATION=9,11

SEQUENCE=MARY,LOCATION=10,4

END-HORIZONTAL-SEQUENCES

// Vertical Sequence Data.

VERTICAL-SEQUENCES

SEQUENCE=PAM,LOCATION=1,1

SEQUENCE=ROBERT,LOCATION=3,3

SEQUENCE=TOM,LOCATION=8,4

SEQUENCE=WENDY,LOCATION=4,5

SEQUENCE=GARY,LOCATION=7,7

SEQUENCE=ALAN,LOCATION=6,9

SEQUENCE=ROGER,LOCATION=1,10

SEQUENCE=ROSE,LOCATION=7,11

SEQUENCE=HARRY,LOCATION=3,13

SEQUENCE=AL,LOCATION=9,14

END-VERTICAL-SEQUENCES

# Appendix D – Test2.cfg

// Log File Configurations.

LOGFILE

// The default log file name.

DEFAULT="log.txt"

END-LOGFILE

// Letter Sequences Configurations.

// Limits on the number of unique letter sequences in the sequecnes file.

SEQUENCES-IN-FILE

MINIMUM=5

MAXIMUM=500

END-SEQUENCES-IN-FILE

// Crozzle Output Configurations.

CROZZLE-OUTPUT

INVALID-CROZZLE-SCORE="INVALID CROZZLE"

UPPERCASE=true

STYLE="<style> table, td { border: 1px solid black; border-collapse: collapse; } td { width:24px; height:18px; text-align: center; } </style>"

BGCOLOUR-EMPTY-TD=#777

BGCOLOUR-NON-EMPTY-TD=#ffffff

END-CROZZLE-OUTPUT

// Crozzle Configurations.

// Limits on the size of the crozzle grid.

CROZZLE-SIZE

MINIMUM-ROWS=5

MAXIMUM-ROWS=500

MINIMUM-COLUMNS=5

MAXIMUM-COLUMNS=500

END-CROZZLE-SIZE

// Limits on the number of horizontal letter sequences and

// vertical letter sequences in a crozzle.

SEQUENCES-IN-CROZZLE

MINIMUM-HORIZONTAL=10

MAXIMUM-HORIZONTAL=200

MINIMUM-VERTICAL=1

MAXIMUM-VERTICAL=5

END-SEQUENCES-IN-CROZZLE

// Limits on the number of

// intersecting vertical sequences for each horizontal sequences, and

// intersecting horizontal sequences for each vertical sequences.

INTERSECTIONS-IN-SEQUENCES

MINIMUM-HORIZONTAL=1

MAXIMUM-HORIZONTAL=500

MINIMUM-VERTICAL=2

MAXIMUM-VERTICAL=500

END-INTERSECTIONS-IN-SEQUENCES

// Limits on duplicate letter sequences in the crozzle.

DUPLICATE-SEQUENCES

MINIMUM=0

MAXIMUM=1

END-DUPLICATE-SEQUENCES

// Limits on the number of valid groups.

VALID-GROUPS

MINIMUM=1

MAXIMUM=2

END-VALID-GROUPS

// Scoring Configurations

// Points per letter that is at the intersection of

// a horizontal and vertical sequence within the crozzle.

INTERSECTING-POINTS

A=1

B=2

C=2

D=2

E=1

F=2

G=2

H=2

I=1

J=4

K=4

L=4

M=4

N=4

O=1

P=8

Q=8

R=8

S=8

T=8

U=1

V=16

W=16

X=32

Y=32

Z=64

z=64

END-INTERSECTING-POINTS

// Points per letter that is not at the intersection of

// a horizontal and vertical sequence within the crozzle.

NON-INTERSECTING-POINTS

A=0

B=0

C=0

D=0

E=0

F=0

G=0

H=0

I=0

J=0

K=0

L=0

M=0

N=0

O=0

P=0

Q=0

R=0

S=0

T=0

U=0

V=0

W=0

X=0

Y=0

Z=0

END-NON-INTERSECTING-POINTS

# Appendix E – Test2.seq

"[a-zA-Z]{2,}",310,153,11426,11889

AL,10,2,141,153

ALAN,10,4,284,298

ANGELA,10,6,424,440

BETTY,10,5,392,407

BILL,10,4,291,305

BRENDA,10,6,428,444

CHARLES,10,7,514,531

FRED,10,4,289,303

GARY,10,4,307,321

GEORGE,10,6,441,457

GRAHAM,10,6,432,448

HARRY,10,5,390,405

JACK,10,4,281,295

JESSICA,10,7,514,531

JILL,10,4,299,313

JOHNATHON,10,9,603,622

LARRY,10,5,394,409

MARK,10,4,299,313

MARY,10,4,313,327

MATTHEW,10,7,538,555

OSCAR,10,5,376,391

PAM,10,3,222,235

PETER,10,5,384,399

ROBERT,10,6,462,478

ROGER,10,5,383,398

RON,10,3,239,252

RONALD,10,6,448,464

ROSE,10,4,313,327

SUSAN,10,5,394,409

TOM,10,3,240,253

WENDY,10,5,391,406

# Appendix F – Test2.czl

// File dependencies.

FILE-DEPENDENCIES

CONFIG-DATA=".\Test2.cfg"

SEQUENCE-DATA=".\Test2.seq"

END-FILE-DEPENDENCIES

// Crozzle Size. The number of rows and columns.

// This crozzle will have 10 rows and 15 columns.

CROZZLE-SIZE

SIZE=1,15

END-CROZZLE-SIZE

// Horizontal Sequence Data.

HORIZONTAL-SEQUENCES

SEQUENCE=ROBERT,LOCATION=1,2

SEQUENCE=OSCAR,LOCATION=1,11

SEQUENCE=AL,LOCATION=2,8

SEQUENCE=JILL,LOCATION=3,2

SEQUENCE=AL,LOCATION=3,7

SEQUENCE=GEORGE,LOCATION=4,10

SEQUENCE=MARY,LOCATION=6,4

SEQUENCE=ROSE,LOCATION=6,10

SEQUENCE=RON,LOCATION=8,4

SEQUENCE=RON,LOCATION=8,8

SEQUENCE=JACK,LOCATION=9,1

SEQUENCE=FRED,LOCATION=9,12

SEQUENCE=ANGELA,LOCATION=10,6

END-HORIZONTAL-SEQUENCES

// Vertical Sequence Data.

VERTICAL-SEQUENCES

SEQUENCE=JESSICA,LOCATION=3,2

SEQUENCE=BILL,LOCATION=1,4

SEQUENCE=MARK,LOCATION=6,4

SEQUENCE=BRENDA,LOCATION=5,6

SEQUENCE=ALAN,LOCATION=2,8

SEQUENCE=ROSE,LOCATION=7,9

SEQUENCE=CHARLES,LOCATION=1,13

SEQUENCE=ROSE,LOCATION=1,15

SEQUENCE=WENDY,LOCATION=6,15

END-VERTICAL-SEQUENCES

# Appendix G – Test3.cfg

// Log File Configurations.

LOGFILE

// The default log file name.

DEFAULT=""

END-LOGFILE

// Letter Sequences Configurations.

// Limits on the number of unique letter sequences in the sequecnes file.

SEQUENCES-IN-FILE

MINIMUM=10

MAXIMUM=1

END-SEQUENCES-IN-FILE

// Crozzle Output Configurations.

CROZZLE-OUTPUT

INVALID-CROZZLE-SCORE="INVALID CROZZLE"

UPPERCASE=uppercase

STYLE="<style> table, td { border: 1px solid black; border-collapse: collapse; } td { width:24px; height:18px; text-align: center; } </style>"

BGCOLOUR-EMPTY-TD=777777

BGCOLOUR-NON-EMPTY-TD=#

END-CROZZLE-OUTPUT

// Crozzle Configurations.

// Limits on the size of the crozzle grid.

CROZZLESIZE

MINIMUM-ROWS=4

MAXIMUM-ROWS=400

MINIMUM-COLUMNS=4

MAXIMUM-COLUMNS=400

END-CROZZLESIZE

// Limits on the number of horizontal letter sequences and

// vertical letter sequences in a crozzle.

SEQUENCES-IN-CROZZLE

MINIMUM-HORIZONTAL=2

MAXIMUM-HORIZONTAL=1

MINIMUM-VERTICAL=2

MAXIMUM-VERTICAL=100

END-SEQUENCES-IN-CROZZLE

// Limits on the number of

// intersecting vertical sequences for each horizontal sequences, and

// intersecting horizontal sequences for each vertical sequences.

INTERSECTIONS-IN-SEQUENCES

MINIMUM-HORIZONTAL=1

MAXIMUM-HORIZONTAL=100

MINIMUM-VERTICAL=2

MAXIMUM-VERTICAL=1

END-INTERSECTIONS-IN-SEQUENCES

// Limits on duplicate letter sequences in the crozzle.

DUPLICATE-SEQUENCES

MIN=0

MAX=0

END-DUPLICATE-SEQUENCES

// Limits on the number of valid groups.

VALID-GROUPS

MAXIMUM=1

MINIMUM=2

END-VALID-GROUPS

// Scoring Configurations

// Points per letter that is at the intersection of

// a horizontal and vertical sequence within the crozzle.

INTERSECTING-POINTS

AAA=1

B=

C,2

D=XXXX

E=1

F=2

G=2

H=2

I=1

J=4

K=4

L=4

M=4

N=4

O=1

P=8

Q=8

R=8

S=8

T=8

U=1

V=16

W=16

X=32

Y=32

Z=64

END-INTERSECTING-POINTS

// Points per letter that is not at the intersection of

// a horizontal and vertical sequence within the crozzle.

NON-INTERSECTING-POINTS

A=0

B=0

C=0

D=0

E=0

F=0

G=0

H=0

I=0

J=0

K=0

L=0

M=0

N=0

O=0

P=0

Q=0

R=0

S=0

T=0

U=0

V=0

W=0

X=0

Y=0

Z=0

END-NON-INTERSECTING-POINTS

# Appendix H – Test3.seq

"[a-zA-Z]{2,}",310,146,10960,11416

AL,10,2,141,153

AL,10,2,141,153

ANGELA\*,10,7,424,441

,10,0,0,10

\*\*\*,10,3,126,139

SIT323,10,6,392,408

Charles,10,7,706,723

FRED,10,4,289,303

GARY,10,4,307,321

GEORGE,10,0,441,457

GRAHAM,10,6,444,448

HARRY,10,5,390,405

JACK,10,4,281,295

JESSICA,10,7,514,531

JILL,5,4,299,313

JOHNATHON,15,9,681,700

LARRY,10,5,394,409

MARK,10,4,299,313

MARY,10,4,313,327

MATTHEW,10,7,538,555

OSCAR,10,5,376,391

PAM,10,3,222,235

PETER,10,5,384,399

ROBERT,10,6,462,478

ROGER,10,5,383,398

RON,10,3,239,252

RONALD,10,6,448,464

ROSE,10,4,313,327

SUSAN,10,5,394,409

TOM,10,3,240,253

WENDY,10,5,391,406

# Appendix I – Test3.czl

// File dependencies.

FILE-DEPENDENCIES

CONFIG-DATA=".\Test3.cfg"

SEQUENCE-DATA=".\Test3.seq"

END-FILE-DEPENDENCIES

// Crozzle Size. The number of rows and columns.

// This crozzle will have 10 rows and 15 columns.

CROZZLE-SIZE

SIZE=10,y

END-CROZZLE-SIZE

// Horizontal Sequence Data.

HORIZONTAL-SEQUENCES

SEQUENCE=ROBERT,LOCATION=aaa,2

SEQUENCE=OSCAR,LOCATION=2,bbb

SEQUENCE=,LOCATION=3,2

SEQUENCE=MARY,6,4

LOCATION=6,11

SEQUENCE=GARY,LOCATION=8

SEQUENCE=?A?K?E,LOCATION=9,1

SEQUENCE=AL,LOCATION=9,14

END-HORIZONTAL-SEQUENCES

// Vertical Sequence Data.

VERTICAL-SEQUENCES

SEQUENCE=JESSICA,LOCATION=3,2

SEQUENCE=BILL,LOCATION=1.5,4

SEQUENCE=MARK,LOCATION=6,4

SEQUENCE=ROGER,LOCATION=6,6

SEQUENCE=HARRY,LOCATION=4,9

SEQUENCE=CHARLES,LOCATION=2,11

SEQUENCE=WENDY,LOCATION=2,15

END-VERTICAL-SEQUENCES

# Appendix J – Crozzle 1 HTML Output

"<!DOCTYPE html><html><head><style> table, td { border: 1px solid black; border-collapse: collapse; } td { width:24px; height:18px; text-align: center; } </style><style>\r\n .empty { background-color: #777777; }\r\n .nonempty { background-color: #ffffff; }\r\n </style></head><body><table><tr><td class=\"nonempty\">P</td><td class=\"nonempty\">E</td><td class=\"nonempty\">T</td><td class=\"nonempty\">E</td><td class=\"nonempty\">R</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"nonempty\">O</td><td class=\"nonempty\">N</td><td class=\"nonempty\">A</td><td class=\"nonempty\">L</td><td class=\"nonempty\">D</td></tr><tr><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">O</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td></tr><tr><td class=\"nonempty\">M</td><td class=\"nonempty\">A</td><td class=\"nonempty\">R</td><td class=\"nonempty\">K</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">G</td><td class=\"nonempty\">R</td><td class=\"nonempty\">A</td><td class=\"nonempty\">H</td><td class=\"nonempty\">A</td><td class=\"nonempty\">M</td></tr><tr><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">O</td><td class=\"empty\"> </td><td class=\"nonempty\">W</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">E</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"empty\"> </td></tr><tr><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">B</td><td class=\"nonempty\">R</td><td class=\"nonempty\">E</td><td class=\"nonempty\">N</td><td class=\"nonempty\">D</td><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"empty\"> </td><td class=\"nonempty\">F</td><td class=\"nonempty\">R</td><td class=\"nonempty\">E</td><td class=\"nonempty\">D</td></tr><tr><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">E</td><td class=\"empty\"> </td><td class=\"nonempty\">N</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"empty\"> </td><td class=\"empty\"> </td></tr><tr><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"empty\"> </td><td class=\"nonempty\">D</td><td class=\"empty\"> </td><td class=\"nonempty\">G</td><td class=\"empty\"> </td><td class=\"nonempty\">L</td><td class=\"nonempty\">A</td><td class=\"nonempty\">R</td><td class=\"nonempty\">R</td><td class=\"nonempty\">Y</td><td class=\"empty\"> </td><td class=\"empty\"> </td></tr><tr><td class=\"nonempty\">B</td><td class=\"nonempty\">E</td><td class=\"nonempty\">T</td><td class=\"nonempty\">T</td><td class=\"nonempty\">Y</td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"nonempty\">O</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td></tr><tr><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">O</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"nonempty\">O</td><td class=\"nonempty\">N</td><td class=\"empty\"> </td><td class=\"nonempty\">S</td><td class=\"nonempty\">U</td><td class=\"nonempty\">S</td><td class=\"nonempty\">A</td><td class=\"nonempty\">N</td></tr><tr><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">M</td><td class=\"nonempty\">A</td><td class=\"nonempty\">R</td><td class=\"nonempty\">Y</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">E</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">L</td><td class=\"empty\"> </td></tr></table><p>Crozzle file is valid.</p><p>Configuration file is valid.</p><p>Word list file is valid.</p><p></p></body></html>"

# Appendix K – Crozzle 2 Output

"<!DOCTYPE html><html><head><style> table, td { border: 1px solid black; border-collapse: collapse; } td { width:24px; height:18px; text-align: center; } </style><style>\r\n .empty { background-color: #777; }\r\n .nonempty { background-color: #ffffff; }\r\n </style></head><body><table><tr><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"nonempty\">O</td><td class=\"nonempty\">B</td><td class=\"nonempty\">E</td><td class=\"nonempty\">R</td><td class=\"nonempty\">T</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">O</td><td class=\"nonempty\">S</td><td class=\"nonempty\">C</td><td class=\"nonempty\">A</td><td class=\"nonempty\">R</td></tr><tr><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">I</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"nonempty\">L</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">H</td><td class=\"empty\"> </td><td class=\"nonempty\">O</td></tr><tr><td class=\"empty\"> </td><td class=\"nonempty\">J</td><td class=\"nonempty\">I</td><td class=\"nonempty\">L</td><td class=\"nonempty\">L</td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"nonempty\">L</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"nonempty\">S</td></tr><tr><td class=\"empty\"> </td><td class=\"nonempty\">E</td><td class=\"empty\"> </td><td class=\"nonempty\">L</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"nonempty\">G</td><td class=\"nonempty\">E</td><td class=\"nonempty\">O</td><td class=\"nonempty\">R</td><td class=\"nonempty\">G</td><td class=\"nonempty\">E</td></tr><tr><td class=\"empty\"> </td><td class=\"nonempty\">S</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">B</td><td class=\"empty\"> </td><td class=\"nonempty\">N</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">L</td><td class=\"empty\"> </td><td class=\"empty\"> </td></tr><tr><td class=\"empty\"> </td><td class=\"nonempty\">S</td><td class=\"empty\"> </td><td class=\"nonempty\">M</td><td class=\"nonempty\">A</td><td class=\"nonempty\">R</td><td class=\"nonempty\">Y</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"nonempty\">O</td><td class=\"nonempty\">S</td><td class=\"nonempty\">E</td><td class=\"empty\"> </td><td class=\"nonempty\">W</td></tr><tr><td class=\"empty\"> </td><td class=\"nonempty\">I</td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"nonempty\">E</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">S</td><td class=\"empty\"> </td><td class=\"nonempty\">E</td></tr><tr><td class=\"empty\"> </td><td class=\"nonempty\">C</td><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"nonempty\">O</td><td class=\"nonempty\">N</td><td class=\"empty\"> </td><td class=\"nonempty\">R</td><td class=\"nonempty\">O</td><td class=\"nonempty\">N</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">N</td></tr><tr><td class=\"nonempty\">J</td><td class=\"nonempty\">A</td><td class=\"nonempty\">C</td><td class=\"nonempty\">K</td><td class=\"empty\"> </td><td class=\"nonempty\">D</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">S</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">F</td><td class=\"nonempty\">R</td><td class=\"nonempty\">E</td><td class=\"nonempty\">D</td></tr><tr><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">A</td><td class=\"nonempty\">N</td><td class=\"nonempty\">G</td><td class=\"nonempty\">E</td><td class=\"nonempty\">L</td><td class=\"nonempty\">A</td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"empty\"> </td><td class=\"nonempty\">Y</td></tr></table><p>Crozzle file is valid.</p><p>Configuration file is valid.</p><p>Word list file is valid.</p><p></p></body></html>"