<WriteTree.py> family tree writer

<WriteTree.py> is an extremely efficient recursive program which writes family tree data to a text file in a format suitable for display as a transposed generation table. The program is written in Python; the source data are stored using MySQL; the output data are written as comma-separated values (CSV) in a text file; and all operations are undertaken in an Ubuntu (Linux) environment running on a Windows 10 computer by means of the Microsoft Windows Subsystem for Linux (WSL) utility. These various features and developments are summarised in four appendices:

1. WSL, Ubuntu, MySQL, and Python installation and initial setup
2. Source data preparation
3. <WriteTree.py> script
4. Sample output

R D Kingdon
March 2022; revised December 2022

Appendix 1. WSL, Ubuntu, MySQL, and Python installation and initial setup

WSL activation
Reference: https://ubuntu.com/tutorials/ubuntu-on-windows#1-overview

- In the Taskbar search box locate <Powershell>, select <Run as Administrator>
- Powershell: `dism.exe /online /enable-feature /featurename:Microsoft-Windows-Subsystem-Linux /all /norestart`
- Powershell: `dism.exe /online /enable-feature /featurename:VirtualMachinePlatform /all /norestart`
- Powershell: `wsl.exe --update`
- Powershell: `wsl --status` [→ `Default Version: 2 ... Kernel version: 5.10.60.1`]
- Exit all processes and Restart
- In Windows Settings <Find a setting> search for <Turn Windows features on or off>, and ensure that <Windows Subsystem for Linux> is checked

Ubuntu installation and initial setup
Reference: https://ubuntu.com/tutorials/ubuntu-on-windows#1-overview

- In the Windows Store locate and download Ubuntu Linux
- From Windows Start locate and select <Ubuntu>, which installs automatically on first use, prompting for a distinct UNIX username and password
- Ubuntu: `sudo apt-get update`
- Ubuntu: `sudo apt-get upgrade`
- Ubuntu: `sudo apt update` [→ `All packages are up to date`]
- Ubuntu: `lsb_release -a` [→ `Ubuntu 20.04.5 LTS`]

Accessing Linux files from Windows, and vice versa
Reference: https://www.youtube.com/watch?v=bRW5r7TK6KM

- Windows File Explorer: `Ctrl-l` then `\\wsl$` in the address box enables direct access to Linux files at path <\\wsl.localhost\Ubuntu\home>
- Ubuntu: `cd /mnt/c/Users` likewise enables direct access to Windows files
- NB Text files prepared in the Windows environment and then ported to Linux must be reformatted using `dos2unix` ***`filename`*** (with this utility installed in Ubuntu by the command `sudo apt install dos2unix`)

MySQL installation and initial setup
Reference: https://pen-y-fan.github.io/2021/08/08/How-to-install-MySQL-on-WSL-2-Ubuntu/

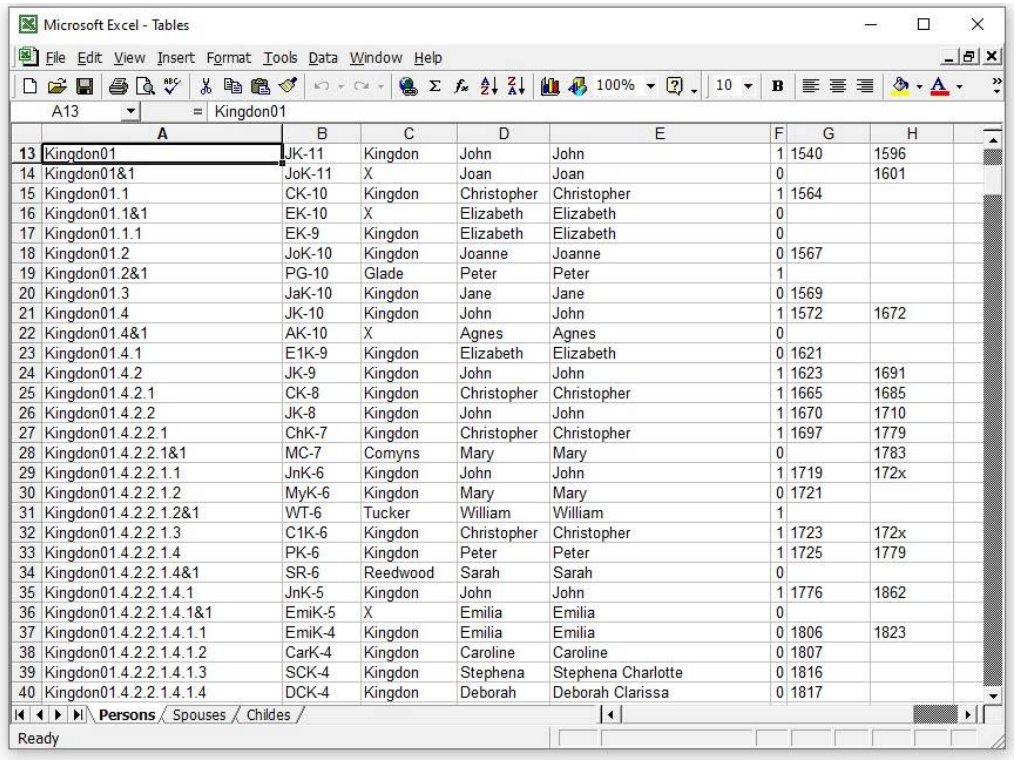
- Ubuntu: `sudo apt install mysql-server`
- Ubuntu: `mysql --version` [→ `mysql Ver 8.0.31-0ubuntu0.20.04.2 for Linux on x86_64 ((Ubuntu))`]
- Ubuntu: `sudo service mysql start` [→ UNIX password prompt]
- Ubuntu: `sudo mysql`
- MySQL: `CREATE DATABASE FamilyDB;`
- MySQL: `CREATE USER 'Genealogist'@'localhost';`
- MySQL: `GRANT ALL PRIVILEGES ON *.* TO 'Genealogist'@'localhost' WITH GRANT OPTION;`
- MySQL: `exit` [→ `Bye`]

Python installation and initial setup
Reference: https://www.digitalocean.com/community/tutorials/how-to-install-python-3-and-set-up-a-programming-environment-on-ubuntu-20-04-quickstart

- Implement these setup commands as required

Appendix 2. Source data preparation

For testing purposes I used the same dataset (based on *The Kingdon Family* Charts I-VIII) as my older Microsoft Access 2000 application, see http://www.idealectic.com/idealectic/Genealogy.htm . This was read into Microsoft Excel 2000 in order to further refine the data model, resulting in three worksheets, <Persons>, <Spouses>, and <Childes>:


Microsoft Excel - Tables

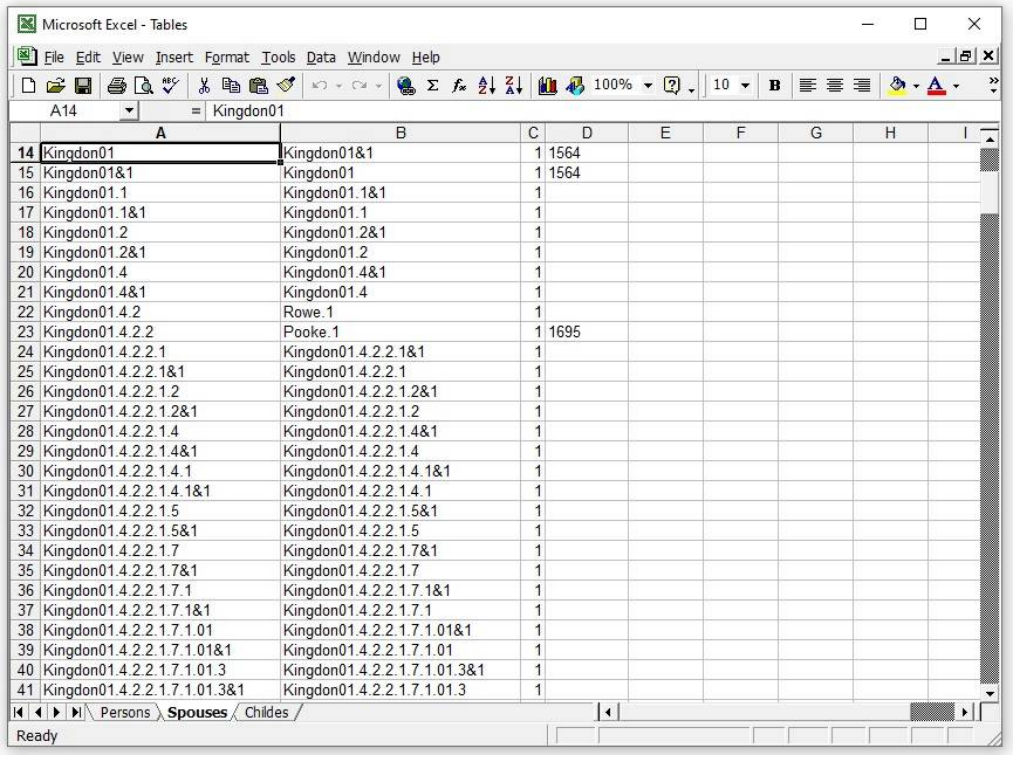
File Edit View Insert Format Tools Data Window Help

A13 = Kingdon01

	A	B	C	D	E	F	G	H
13	Kingdon01	JK-11	Kingdon	John	John	1	1540	1596
14	Kingdon01&1	JoK-11	X	Joan	Joan	0		1601
15	Kingdon01.1	CK-10	Kingdon	Christopher	Christopher	1	1564	
16	Kingdon01.1&1	EK-10	X	Elizabeth	Elizabeth	0		
17	Kingdon01.1.1	EK-9	Kingdon	Elizabeth	Elizabeth	0		
18	Kingdon01.2	JoK-10	Kingdon	Joanne	Joanne	0	1567	
19	Kingdon01.2&1	PG-10	Glade	Peter	Peter	1		
20	Kingdon01.3	JaK-10	Kingdon	Jane	Jane	0	1569	
21	Kingdon01.4	JK-10	Kingdon	John	John	1	1572	1672
22	Kingdon01.4&1	AK-10	X	Agnes	Agnes	0		
23	Kingdon01.4.1	E1K-9	Kingdon	Elizabeth	Elizabeth	0	1621	
24	Kingdon01.4.2	JK-9	Kingdon	John	John	1	1623	1691
25	Kingdon01.4.2.1	CK-8	Kingdon	Christopher	Christopher	1	1665	1685
26	Kingdon01.4.2.2	JK-8	Kingdon	John	John	1	1670	1710
27	Kingdon01.4.2.2.1	ChK-7	Kingdon	Christopher	Christopher	1	1697	1779
28	Kingdon01.4.2.2.1&1	MC-7	Comyns	Mary	Mary	0		1783
29	Kingdon01.4.2.2.1.1	JnK-6	Kingdon	John	John	1	1719	172x
30	Kingdon01.4.2.2.1.2	MyK-6	Kingdon	Mary	Mary	0	1721	
31	Kingdon01.4.2.2.1.2&1	WT-6	Tucker	William	William	1		
32	Kingdon01.4.2.2.1.3	C1K-6	Kingdon	Christopher	Christopher	1	1723	172x
33	Kingdon01.4.2.2.1.4	PK-6	Kingdon	Peter	Peter	1	1725	1779
34	Kingdon01.4.2.2.1.4&1	SR-6	Reedwood	Sarah	Sarah	0		
35	Kingdon01.4.2.2.1.4.1	JnK-5	Kingdon	John	John	1	1776	1862
36	Kingdon01.4.2.2.1.4.1&1	EmiK-5	X	Emilia	Emilia	0		
37	Kingdon01.4.2.2.1.4.1.1	EmiK-4	Kingdon	Emilia	Emilia	0	1806	1823
38	Kingdon01.4.2.2.1.4.1.2	CarK-4	Kingdon	Caroline	Caroline	0	1807	
39	Kingdon01.4.2.2.1.4.1.3	SCK-4	Kingdon	Stephena	Stephena Charlotte	0	1816	
40	Kingdon01.4.2.2.1.4.1.4	DCK-4	Kingdon	Deborah	Deborah Clarissa	0	1817	

Persons / Spouses / Childes

Ready


Microsoft Excel - Tables

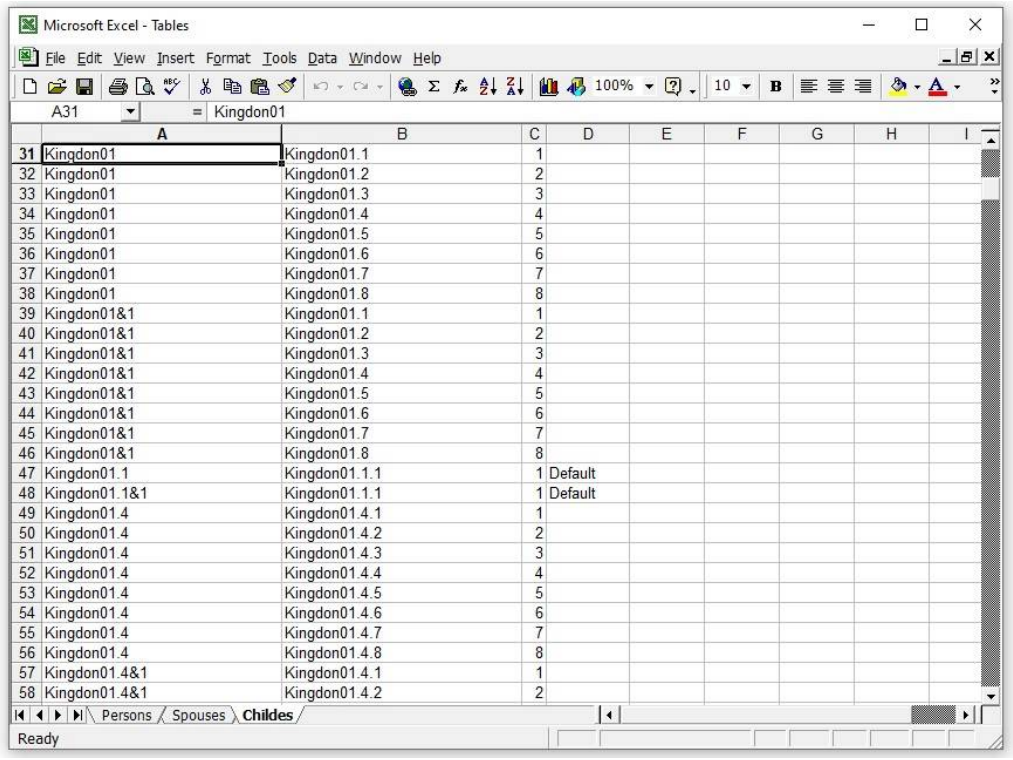
File Edit View Insert Format Tools Data Window Help

A14 = Kingdon01

	A	B	C	D	E	F	G	H	I
14	Kingdon01	Kingdon01&1	1	1564					
15	Kingdon01&1	Kingdon01	1	1564					
16	Kingdon01.1	Kingdon01.1&1	1						
17	Kingdon01.1&1	Kingdon01.1	1						
18	Kingdon01.2	Kingdon01.2&1	1						
19	Kingdon01.2&1	Kingdon01.2	1						
20	Kingdon01.4	Kingdon01.4&1	1						
21	Kingdon01.4&1	Kingdon01.4	1						
22	Kingdon01.4.2	Rowe.1	1						
23	Kingdon01.4.2.2	Pooke.1	1	1695					
24	Kingdon01.4.2.2.1	Kingdon01.4.2.2.1&1	1						
25	Kingdon01.4.2.2.1&1	Kingdon01.4.2.2.1	1						
26	Kingdon01.4.2.2.1.2	Kingdon01.4.2.2.1.2&1	1						
27	Kingdon01.4.2.2.1.2&1	Kingdon01.4.2.2.1.2	1						
28	Kingdon01.4.2.2.1.4	Kingdon01.4.2.2.1.4&1	1						
29	Kingdon01.4.2.2.1.4&1	Kingdon01.4.2.2.1.4	1						
30	Kingdon01.4.2.2.1.4.1	Kingdon01.4.2.2.1.4.1&1	1						
31	Kingdon01.4.2.2.1.4.1&1	Kingdon01.4.2.2.1.4.1	1						
32	Kingdon01.4.2.2.1.5	Kingdon01.4.2.2.1.5&1	1						
33	Kingdon01.4.2.2.1.5&1	Kingdon01.4.2.2.1.5	1						
34	Kingdon01.4.2.2.1.7	Kingdon01.4.2.2.1.7&1	1						
35	Kingdon01.4.2.2.1.7&1	Kingdon01.4.2.2.1.7	1						
36	Kingdon01.4.2.2.1.7.1	Kingdon01.4.2.2.1.7.1&1	1						
37	Kingdon01.4.2.2.1.7.1&1	Kingdon01.4.2.2.1.7.1	1						
38	Kingdon01.4.2.2.1.7.1.01	Kingdon01.4.2.2.1.7.1.01&1	1						
39	Kingdon01.4.2.2.1.7.1.01&1	Kingdon01.4.2.2.1.7.1.01	1						
40	Kingdon01.4.2.2.1.7.1.01.3	Kingdon01.4.2.2.1.7.1.01.3&1	1						
41	Kingdon01.4.2.2.1.7.1.01.3&1	Kingdon01.4.2.2.1.7.1.01.3	1						

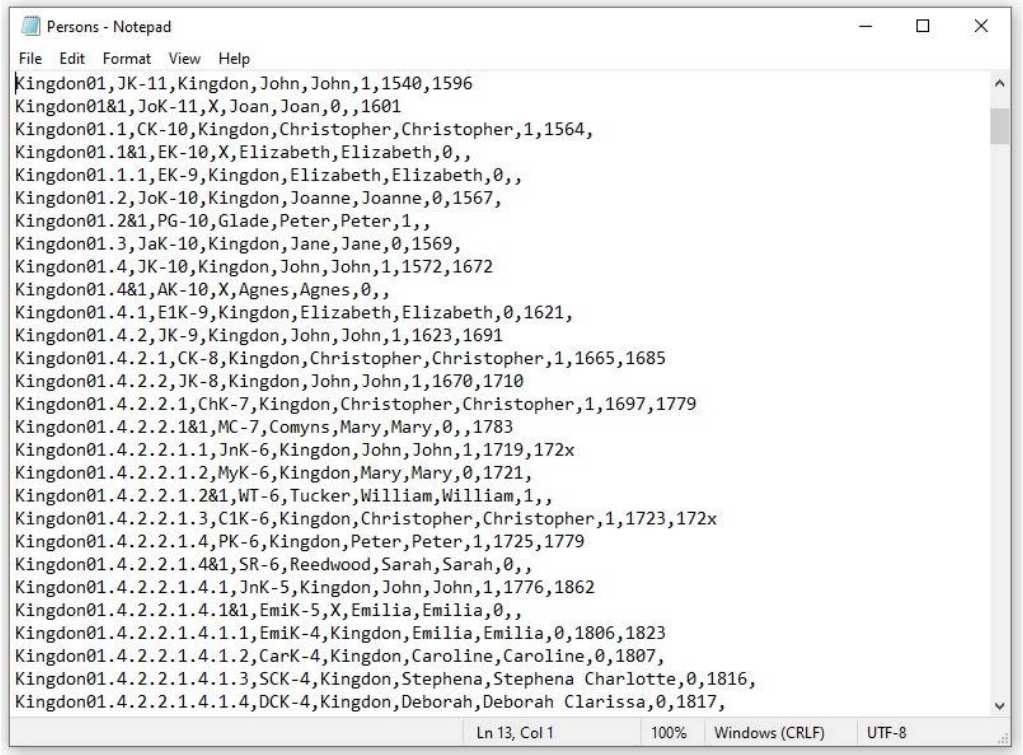
Persons / Spouses / Childes

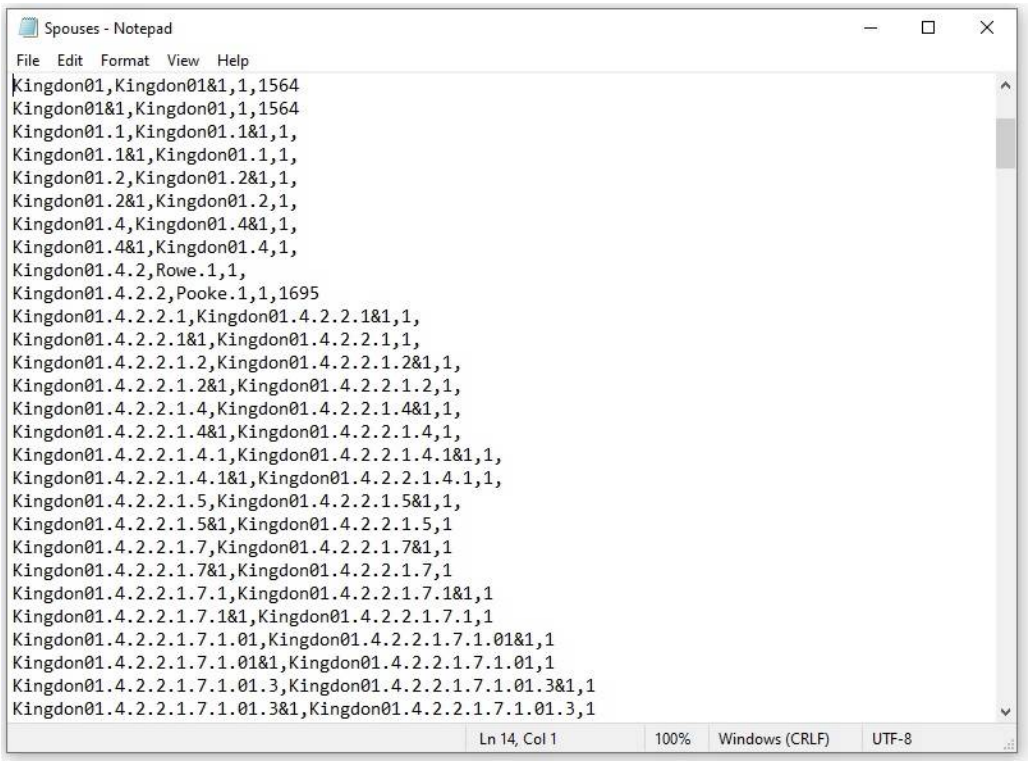
Ready

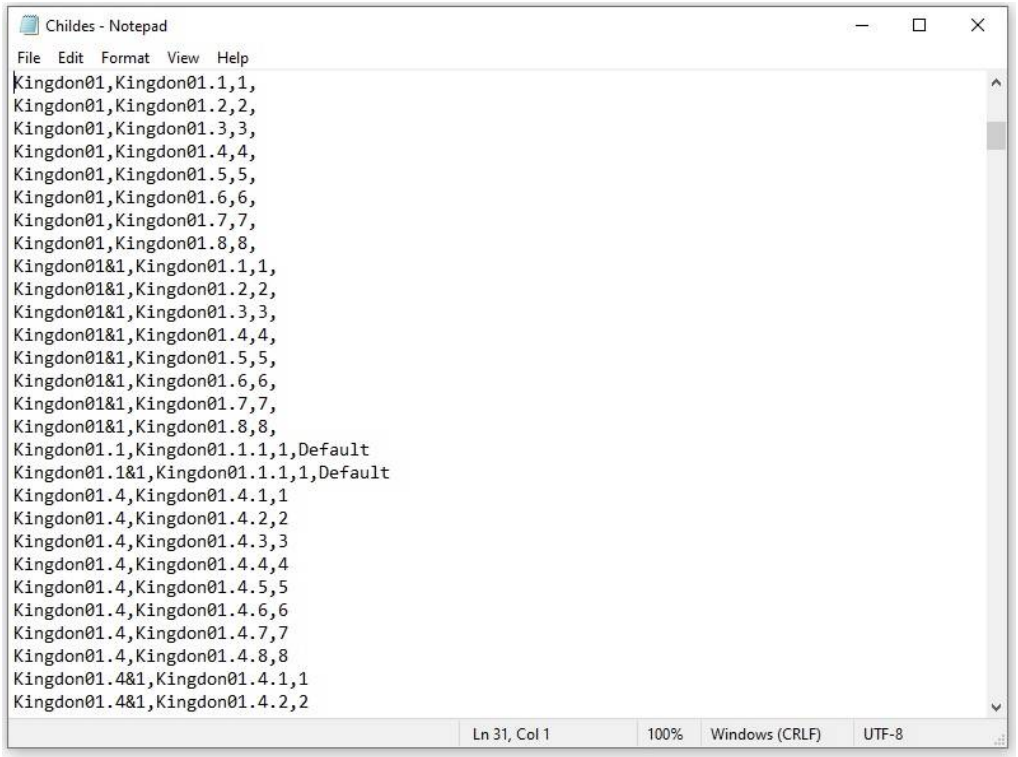


	A	B	C	D
31	Kingdon01	Kingdon01.1	1	
32	Kingdon01	Kingdon01.2	2	
33	Kingdon01	Kingdon01.3	3	
34	Kingdon01	Kingdon01.4	4	
35	Kingdon01	Kingdon01.5	5	
36	Kingdon01	Kingdon01.6	6	
37	Kingdon01	Kingdon01.7	7	
38	Kingdon01	Kingdon01.8	8	
39	Kingdon01&1	Kingdon01.1	1	
40	Kingdon01&1	Kingdon01.2	2	
41	Kingdon01&1	Kingdon01.3	3	
42	Kingdon01&1	Kingdon01.4	4	
43	Kingdon01&1	Kingdon01.5	5	
44	Kingdon01&1	Kingdon01.6	6	
45	Kingdon01&1	Kingdon01.7	7	
46	Kingdon01&1	Kingdon01.8	8	
47	Kingdon01.1	Kingdon01.1.1	1	Default
48	Kingdon01.1&1	Kingdon01.1.1	1	Default
49	Kingdon01.4	Kingdon01.4.1	1	
50	Kingdon01.4	Kingdon01.4.2	2	
51	Kingdon01.4	Kingdon01.4.3	3	
52	Kingdon01.4	Kingdon01.4.4	4	
53	Kingdon01.4	Kingdon01.4.5	5	
54	Kingdon01.4	Kingdon01.4.6	6	
55	Kingdon01.4	Kingdon01.4.7	7	
56	Kingdon01.4	Kingdon01.4.8	8	
57	Kingdon01.4&1	Kingdon01.4.1	1	
58	Kingdon01.4&1	Kingdon01.4.2	2	

These three worksheets were then saved as CSV files <Persons.csv>, <Spouses.csv>, and <Childes.csv>:




Spouses - Notepad
File Edit Format View Help
Kingdon01,Kingdon01&1,1,1564
Kingdon01&1,Kingdon01,1,1564
Kingdon01.1,Kingdon01.1&1,1,
Kingdon01.1&1,Kingdon01.1,1,
Kingdon01.2,Kingdon01.2&1,1,
Kingdon01.2&1,Kingdon01.2,1,
Kingdon01.4,Kingdon01.4&1,1,
Kingdon01.4&1,Kingdon01.4,1,
Kingdon01.4.2,Rowe.1,1,
Kingdon01.4.2.2,Pooke.1,1,1695
Kingdon01.4.2.2.1,Kingdon01.4.2.2.1&1,1,
Kingdon01.4.2.2.1&1,Kingdon01.4.2.2.1,1,
Kingdon01.4.2.2.1.2,Kingdon01.4.2.2.1.2&1,1,
Kingdon01.4.2.2.1.2&1,Kingdon01.4.2.2.1.2,1,
Kingdon01.4.2.2.1.4,Kingdon01.4.2.2.1.4&1,1,
Kingdon01.4.2.2.1.4&1,Kingdon01.4.2.2.1.4,1,
Kingdon01.4.2.2.1.4.1,Kingdon01.4.2.2.1.4.1&1,1,
Kingdon01.4.2.2.1.4.1&1,Kingdon01.4.2.2.1.4.1,1,
Kingdon01.4.2.2.1.5,Kingdon01.4.2.2.1.5&1,1,
Kingdon01.4.2.2.1.5&1,Kingdon01.4.2.2.1.5,1
Kingdon01.4.2.2.1.7,Kingdon01.4.2.2.1.7&1,1
Kingdon01.4.2.2.1.7&1,Kingdon01.4.2.2.1.7,1
Kingdon01.4.2.2.1.7.1,Kingdon01.4.2.2.1.7.1&1,1
Kingdon01.4.2.2.1.7.1&1,Kingdon01.4.2.2.1.7.1,1
Kingdon01.4.2.2.1.7.1.01,Kingdon01.4.2.2.1.7.1.01&1,1
Kingdon01.4.2.2.1.7.1.01&1,Kingdon01.4.2.2.1.7.1.01,1
Kingdon01.4.2.2.1.7.1.01.3,Kingdon01.4.2.2.1.7.1.01.3&1,1
Kingdon01.4.2.2.1.7.1.01.3&1,Kingdon01.4.2.2.1.7.1.01.3,1
Ln 14, Col 1
100%
Windows (CRLF)
UTF-8


Childes - Notepad
File Edit Format View Help
Kingdon01,Kingdon01.1,1,
Kingdon01,Kingdon01.2,2,
Kingdon01,Kingdon01.3,3,
Kingdon01,Kingdon01.4,4,
Kingdon01,Kingdon01.5,5,
Kingdon01,Kingdon01.6,6,
Kingdon01,Kingdon01.7,7,
Kingdon01,Kingdon01.8,8,
Kingdon01&1,Kingdon01.1,1,
Kingdon01&1,Kingdon01.2,2,
Kingdon01&1,Kingdon01.3,3,
Kingdon01&1,Kingdon01.4,4,
Kingdon01&1,Kingdon01.5,5,
Kingdon01&1,Kingdon01.6,6,
Kingdon01&1,Kingdon01.7,7,
Kingdon01&1,Kingdon01.8,8,
Kingdon01.1,Kingdon01.1.1,1,Default
Kingdon01.1&1,Kingdon01.1.1,1,Default
Kingdon01.4,Kingdon01.4.1,1
Kingdon01.4,Kingdon01.4.2,2
Kingdon01.4,Kingdon01.4.3,3
Kingdon01.4,Kingdon01.4.4,4
Kingdon01.4,Kingdon01.4.5,5
Kingdon01.4,Kingdon01.4.6,6
Kingdon01.4,Kingdon01.4.7,7
Kingdon01.4,Kingdon01.4.8,8
Kingdon01.4&1,Kingdon01.4.1,1
Kingdon01.4&1,Kingdon01.4.2,2
Ln 31, Col 1
100%
Windows (CRLF)
UTF-8

These three CSV files were then copied to the Ubuntu (Linux) environment where after reformatting (using `dos2unix` *`filename`*) they were uploaded to the MySQL database by means of Bash script <FamilyDBSetup.sh>:

```
#! /bin/bash
#
# What: Bash script FamilyDBSetup.sh
# Where: FamilyDB
# When: 8 March 2022
# Who: Roger Kingdon
# Why: Script to create and populate FamilyDB tables
# How: ./FamilyDBSetup.sh [rtn]
#
echo -e "SET GLOBAL local_infile = 1;" > tmp1.bat
echo -e "USE FamilyDB;\n"\
"CREATE TABLE Persons (PerID VARCHAR(50) PRIMARY KEY, Mnemonic VARCHAR(50) NOT
NULL, "\
"Surname VARCHAR(50) NOT NULL, KnownAs VARCHAR(50) NOT NULL, GivenNames
VARCHAR(50) NOT NULL, "\
"Male BOOLEAN NOT NULL, Birth VARCHAR(50) DEFAULT '', Death VARCHAR(50) DEFAULT
'');\n"\
"CREATE TABLE Spouses (PerID VARCHAR(50) NOT NULL, SpID VARCHAR(50) NOT NULL, "\
"Seq INTEGER NOT NULL, Notes VARCHAR(50) DEFAULT '');\n"\
"CREATE TABLE Childes (PerID VARCHAR(50) NOT NULL, ChID VARCHAR(50) NOT NULL,
"\
"Seq INTEGER NOT NULL, Notes VARCHAR(50) DEFAULT '');\n"\
"LOAD DATA LOCAL INFILE 'Persons.csv' INTO TABLE Persons FIELDS TERMINATED BY
',';\n"\
"LOAD DATA LOCAL INFILE 'Spouses.csv' INTO TABLE Spouses FIELDS TERMINATED BY
',';\n"\
"LOAD DATA LOCAL INFILE 'Childes.csv' INTO TABLE Childes FIELDS TERMINATED BY
',';"\
> tmp2.bat
mysql --local_infile=1 -u Genealogist < tmp1.bat
mysql --local_infile=1 -u Genealogist < tmp2.bat
rm tmp*.bat
```

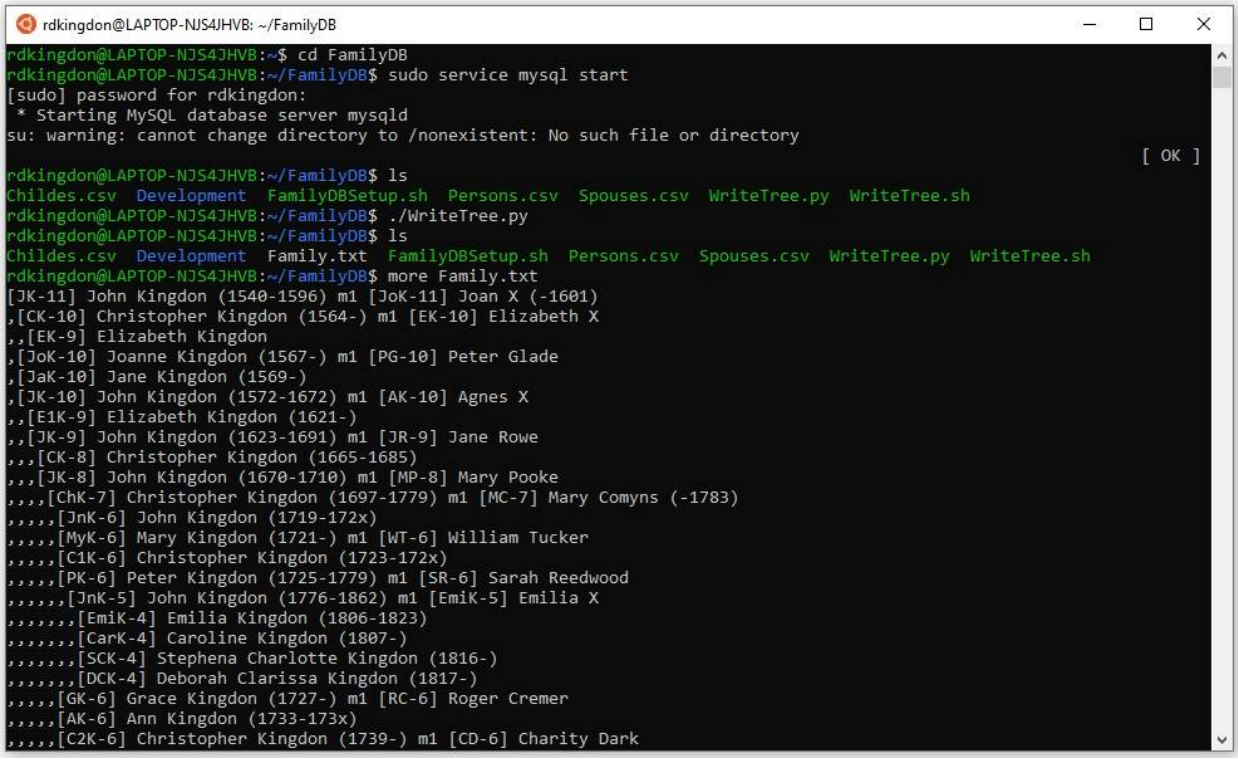
Appendix 3. <WriteTree.py> script

```
#! /usr/bin/python3
#
# What: Python script WriteTree.py
# Where: FamilyDB
# When: 8 March 2022
# Who: Roger Kingdon
# Why: Writes family tree for nominated person to nominated output file
# How: Specify user-defined parameters; ./WriteTree.py [rtn]
#
# User-defined parameters
# blnTree = True or False generates family tree headed by an ancestor or a
descendant respectively
# strHead is the head person ID (e.g. "Kingdon01" or "Kingdon06.1.2.2.2" for
blnTree = True or False respectively)
# strFile is the output file name
#
blnTree = True
strHead = "Kingdon01"
strFile = "Family.txt"
#
# End of user-defined parameters
#
#
# Spouses: Returns a text string naming nominated person and their spouse(s)
#
def Spouses(strID):
  strQ = "SELECT * FROM Persons WHERE Persons.PerID='" + strID + "'"
  cursor.execute(strQ)
  strRT = cursor.fetchall()
  for strR in strRT:
    strS = "[" + strR[1] + "] " + strR[4] + " " + strR[2]
    strB = strR[6]
    strD = strR[7]
    blnBD = False
    if (strB != ""):
      strB = strB[-4:]
      blnBD = True
    if (strD != ""):
      strD = strD[-4:]
      blnBD = True
    if (blnBD):
      strS = strS + " (" + strB + "-" + strD + ")"
#
  strQ = "SELECT Persons.*, Spouses.Seq FROM Spouses INNER JOIN Persons ON
Spouses.SpID = Persons.PerID WHERE Spouses.PerID='" + strID + "' ORDER BY
Spouses.Seq"
  cursor.execute(strQ)
  strRT = cursor.fetchall()
  for strR in strRT:
    strS = strS + " m" + str(strR[8]) + " [" + strR[1] + "] " + strR[4] + " " +
strR[2]
    strB = strR[6]
    strD = strR[7]
    blnBD = False
    if (strB != ""):
      strB = strB[-4:]
      blnBD = True
    if (strD != ""):
      strD = strD[-4:]
      blnBD = True
    if (blnBD):
```

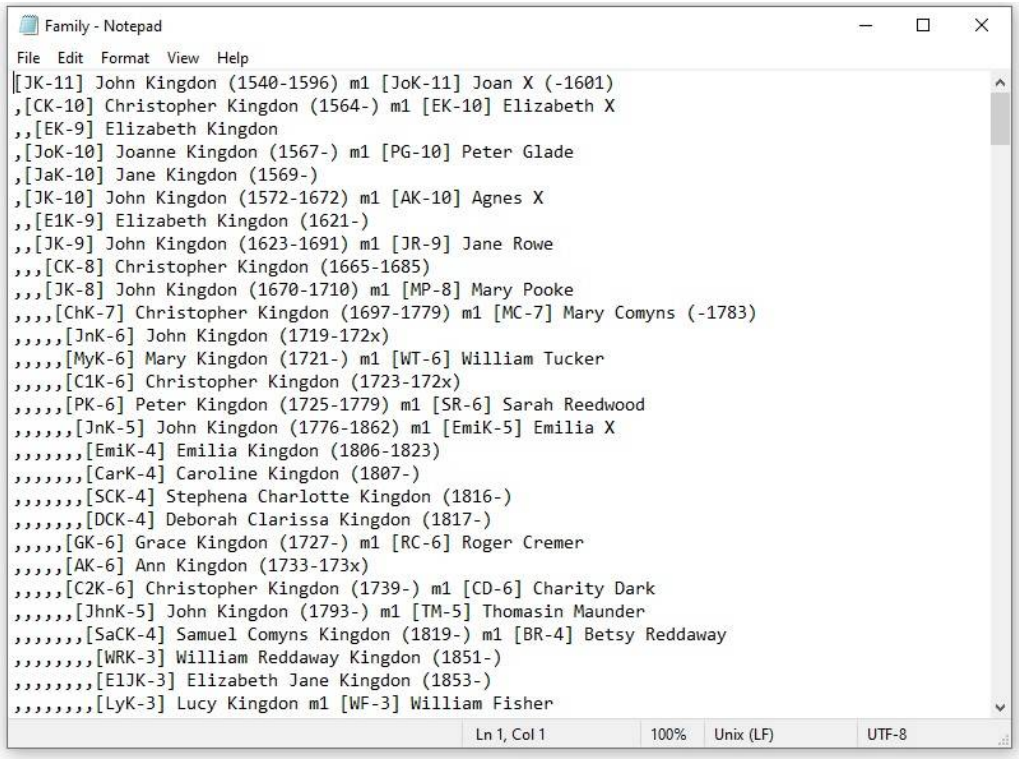
```
      strS = strS + " (" + strB + "-" + strD + ")"
#
  return strS
#
# End of Spouses
#
#
# WriteGens: Recursively writes related generations of nominated person to
nominated output file
#
def WriteGens(strGen0, strID0):
  strGen = strGen0 + ","
  if (blnTree):
    strQ = "SELECT Childes.ChID FROM Childes WHERE Childes.PerID='" + strID0 +
"' ORDER BY Childes.Seq"
  else:
    strQ = "SELECT Childes.PerID FROM Childes INNER JOIN Persons ON
Childes.PerID = Persons.PerID WHERE Childes.ChID='" + strID0 + "' ORDER BY
Persons.Male DESC"
  cursor.execute(strQ)
  strRT = cursor.fetchall()
  for strR in strRT:
    strID = strR[0]
    txtOut.write(strGen + Spouses(strID) + "\n")
    WriteGens(strGen, strID)
#
# End of WriteGens
#
#
# Start of WriteTree.py execution
#
from mysql.connector import connect
connection = connect(host="localhost", user="Genealogist", database="FamilyDB")
cursor = connection.cursor()
txtOut = open(strFile, "a+")
#
strGen = ""
strQ = "SELECT PerID FROM Persons WHERE Persons.PerID='" + strHead + "'"
cursor.execute(strQ)
strRT = cursor.fetchall()
for strR in strRT:
  strID = strR[0]
  if (strID == strHead):
    txtOut.write(strGen + Spouses(strID) + "\n")
    WriteGens(strGen, strID)
#
txtOut.close()
cursor.close()
connection.close()
#
# End of WriteTree.py execution
#
```

Appendix 4. Sample output

Running Python script <WriteTree.py> generates output file <Family.txt>:

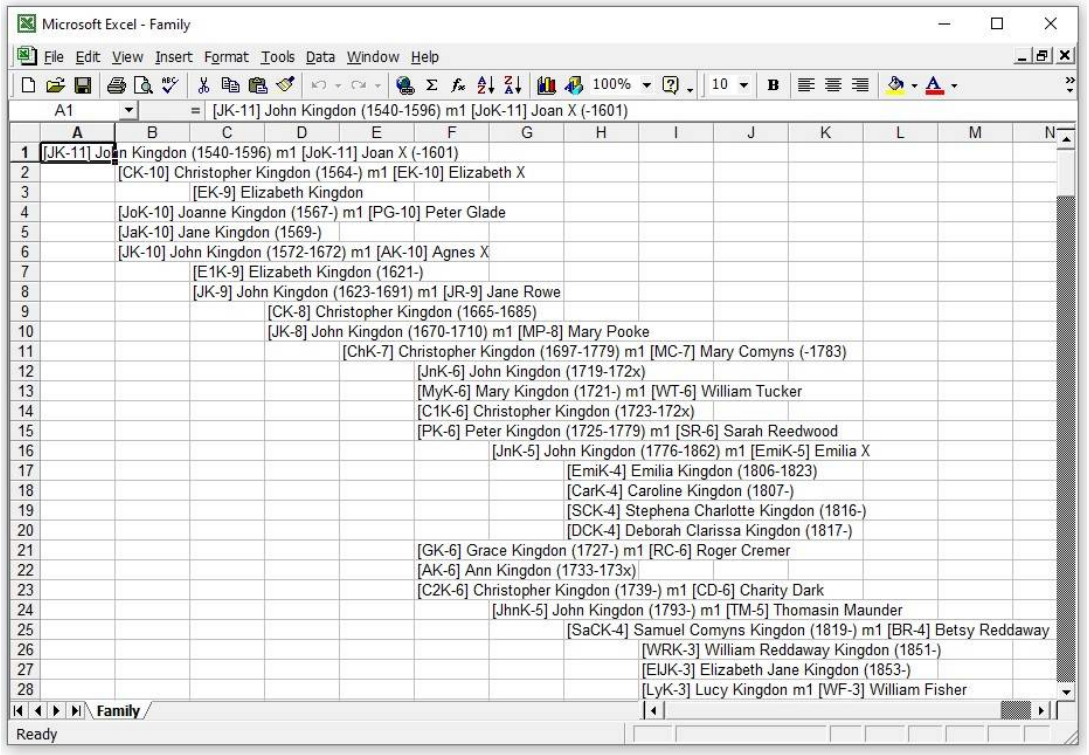


```
rdkingdon@LAPTOP-NJS4JHVB: ~/FamilyDB
rdkingdon@LAPTOP-NJS4JHVB:~$ cd FamilyDB
rdkingdon@LAPTOP-NJS4JHVB:~/FamilyDB$ sudo service mysql start
[sudo] password for rdkingdon:
 * Starting MySQL database server mysqld
su: warning: cannot change directory to /nonexistent: No such file or directory
                                                                                [ OK ]
rdkingdon@LAPTOP-NJS4JHVB:~/FamilyDB$ ls
Childes.csv  Development  FamilyDBSetup.sh  Persons.csv  Spouses.csv  WriteTree.py  WriteTree.sh
rdkingdon@LAPTOP-NJS4JHVB:~/FamilyDB$ ./WriteTree.py
rdkingdon@LAPTOP-NJS4JHVB:~/FamilyDB$ ls
Childes.csv  Development  Family.txt  FamilyDBSetup.sh  Persons.csv  Spouses.csv  WriteTree.py  WriteTree.sh
rdkingdon@LAPTOP-NJS4JHVB:~/FamilyDB$ more Family.txt
[JK-11] John Kingdon (1540-1596) m1 [JoK-11] Joan X (-1601)
,[CK-10] Christopher Kingdon (1564-) m1 [EK-10] Elizabeth X
,,[EK-9] Elizabeth Kingdon
,[JoK-10] Joanne Kingdon (1567-) m1 [PG-10] Peter Glade
,[JaK-10] Jane Kingdon (1569-)
,[JK-10] John Kingdon (1572-1672) m1 [AK-10] Agnes X
,,[E1K-9] Elizabeth Kingdon (1621-)
,,[JK-9] John Kingdon (1623-1691) m1 [JR-9] Jane Rowe
,,,[CK-8] Christopher Kingdon (1665-1685)
,,,[JK-8] John Kingdon (1670-1710) m1 [MP-8] Mary Pooke
,,,,[ChK-7] Christopher Kingdon (1697-1779) m1 [MC-7] Mary Comyns (-1783)
,,,,,[JnK-6] John Kingdon (1719-172x)
,,,,,[MyK-6] Mary Kingdon (1721-) m1 [WT-6] William Tucker
,,,,,[C1K-6] Christopher Kingdon (1723-172x)
,,,,,[PK-6] Peter Kingdon (1725-1779) m1 [SR-6] Sarah Reedwood
,,,,,,[JnK-5] John Kingdon (1776-1862) m1 [EmiK-5] Emilia X
,,,,,,,[EmiK-4] Emilia Kingdon (1806-1823)
,,,,,,,[CarK-4] Caroline Kingdon (1807-)
,,,,,,,[SCK-4] Stephena Charlotte Kingdon (1816-)
,,,,,,,[DCK-4] Deborah Clarissa Kingdon (1817-)
,,,,,[GK-6] Grace Kingdon (1727-) m1 [RC-6] Roger Cremer
,,,,,[AK-6] Ann Kingdon (1733-173x)
,,,,,[C2K-6] Christopher Kingdon (1739-) m1 [CD-6] Charity Dark
```



```
Family - Notepad
File  Edit  Format  View  Help
[JK-11] John Kingdon (1540-1596) m1 [JoK-11] Joan X (-1601)
,[CK-10] Christopher Kingdon (1564-) m1 [EK-10] Elizabeth X
,,[EK-9] Elizabeth Kingdon
,[JoK-10] Joanne Kingdon (1567-) m1 [PG-10] Peter Glade
,[JaK-10] Jane Kingdon (1569-)
,[JK-10] John Kingdon (1572-1672) m1 [AK-10] Agnes X
,,[E1K-9] Elizabeth Kingdon (1621-)
,,[JK-9] John Kingdon (1623-1691) m1 [JR-9] Jane Rowe
,,,[CK-8] Christopher Kingdon (1665-1685)
,,,[JK-8] John Kingdon (1670-1710) m1 [MP-8] Mary Pooke
,,,,[ChK-7] Christopher Kingdon (1697-1779) m1 [MC-7] Mary Comyns (-1783)
,,,,,[JnK-6] John Kingdon (1719-172x)
,,,,,[MyK-6] Mary Kingdon (1721-) m1 [WT-6] William Tucker
,,,,,[C1K-6] Christopher Kingdon (1723-172x)
,,,,,[PK-6] Peter Kingdon (1725-1779) m1 [SR-6] Sarah Reedwood
,,,,,,[JnK-5] John Kingdon (1776-1862) m1 [EmiK-5] Emilia X
,,,,,,,[EmiK-4] Emilia Kingdon (1806-1823)
,,,,,,,[CarK-4] Caroline Kingdon (1807-)
,,,,,,,[SCK-4] Stephena Charlotte Kingdon (1816-)
,,,,,,,[DCK-4] Deborah Clarissa Kingdon (1817-)
,,,,,[GK-6] Grace Kingdon (1727-) m1 [RC-6] Roger Cremer
,,,,,[AK-6] Ann Kingdon (1733-173x)
,,,,,[C2K-6] Christopher Kingdon (1739-) m1 [CD-6] Charity Dark
,,,,,,[JhnK-5] John Kingdon (1793-) m1 [TM-5] Thomasin Maunder
,,,,,,,[SaCK-4] Samuel Comyns Kingdon (1819-) m1 [BR-4] Betsy Reddaway
,,,,,,,,[WRK-3] William Reddaway Kingdon (1851-)
,,,,,,,,[E1JK-3] Elizabeth Jane Kingdon (1853-)
,,,,,,,,[LyK-3] Lucy Kingdon m1 [WF-3] William Fisher
Ln 1, Col 1   100%   Unix (LF)   UTF-8
```

Once it has been copied to the Windows environment <Family.txt> may be opened in Microsoft Excel (with comma-delimited fields) to display the family tree as a transposed generation table:



This is the required output.