Upload your assignment to the Learning Hub at learn.bcit.ca before the end of lesson 6 into the Activities🡪Assignments🡪Assigment2 dropbox.

Ensure that every function is named as a verb, has DocString comments, follows good indentation and other style guidelines.

Create three python files named data.py, main.py, and assignment2.py, with the functionality as follows. The bottom of main.py must have the following guard code as the final two lines:

if \_\_name\_\_ == '\_\_main\_\_':

main()

# data.py

This script creates and populates the same three tuple variables that we used in the first project (plus an additional one). You can copy/paste the code from right here into your data.py script:

# START HERE AND PASTE INTO YOUR LAB IN YOUR IDE

countries\_and\_capitals = (['Afghanistan', 'Kabul'], ['Albania', 'Tirana (Tirane)'], ['Algeria', 'Algiers'], ['Andorra', 'Andorra la Vella'], ['Angola', 'Luanda'], ['Antigua and Barbuda', "Saint John's"], ['Argentina', 'Buenos Aires'], ['Armenia', 'Yerevan'], ['Australia', 'Canberra'], ['Austria', 'Vienna'], ['Azerbaijan', 'Baku'], ['Bahamas', 'Nassau'], ['Bahrain', 'Manama'], ['Bangladesh', 'Dhaka'], ['Barbados', 'Bridgetown'], ['Belarus', 'Minsk'], ['Belgium', 'Brussels'], ['Belize', 'Belmopan'], ['Benin', 'Porto Novo'], ['Bhutan', 'Thimphu'], ['Bolivia', 'Sucre'], ['Bosnia and Herzegovina', 'Sarajevo'], ['Botswana', 'Gaborone'], ['Brazil', 'Brasilia'], ['Brunei', 'Bandar Seri Begawan'], ['Bulgaria', 'Sofia'], ['Burkina Faso', 'Ouagadougou'], ['Burundi', 'Gitega'], ['Cambodia', 'Phnom Penh'], ['Cameroon', 'Yaounde'], ['Canada', 'Ottawa'], ['Cape Verde', 'Praia'], ['Central African Republic', 'Bangui'], ['Chad', "N'Djamena"], ['Chile', 'Santiago'], ['China', 'Beijing'], ['Colombia', 'Bogota'], ['Comoros', 'Moroni'], ['Congo, Democratic Republic of the', 'Kinshasa'], ['Congo, Republic of the', 'Brazzaville'], ['Costa Rica', 'San Jose'], ["Cote d'Ivoire (Ivory Coast)", 'Yamoussoukro'], ['Croatia', 'Zagreb'], ['Cuba', 'Havana'], ['Cyprus', 'Nicosia'], ['Czech Republic (Czechia)', 'Prague'], ['Denmark', 'Copenhagen'], ['Djibouti', 'Djibouti'], ['Dominica', 'Roseau'], ['Dominican Republic', 'Santo Domingo'], ['East Timor', 'Dili'], ['Ecuador', 'Quito'], ['Egypt', 'Cairo'], ['El Salvador', 'San Salvador'], ['England', 'London'], ['Equatorial Guinea', 'Malabo'], ['Eritrea', 'Asmara'], ['Estonia', 'Tallinn'], ['Eswatini (Swaziland)', 'Mbabana'], ['Ethiopia', 'Addis Ababa'], ['Federated States of Micronesia', 'Palikir'], ['Fiji', 'Suva'], ['Finland', 'Helsinki'], ['France', 'Paris'], ['Gabon', 'Libreville'], ['Gambia', 'Banjul'], ['Georgia', 'Tbilisi'], ['Germany', 'Berlin'], ['Ghana', 'Accra'], ['Greece', 'Athens'], ['Grenada', "Saint George's"], ['Guatemala', 'Guatemala City'], ['Guinea', 'Conakry'], ['Guinea-Bissau', 'Bissau'], ['Guyana', 'Georgetown'], ['Haiti', 'Port au Prince'], ['Honduras', 'Tegucigalpa'], ['Hungary', 'Budapest'], ['Iceland', 'Reykjavik'], ['India', 'New Delhi'], ['Indonesia', 'Jakarta'], ['Iran', 'Tehran'], ['Iraq', 'Baghdad'], ['Ireland', 'Dublin'], ['Israel', 'Jerusalem'], ['Italy', 'Rome'], ['Jamaica', 'Kingston'], ['Japan', 'Tokyo'], ['Jordan', 'Amman'], ['Kazakhstan', 'Nur-Sultan'], ['Kenya', 'Nairobi'], ['Kiribati', 'Tarawa Atoll'], ['Kosovo', 'Pristina'], ['Kuwait', 'Kuwait City'], ['Kyrgyzstan', 'Bishkek'], ['Laos', 'Vientiane'], ['Latvia', 'Riga'], ['Lebanon', 'Beirut'], ['Lesotho', 'Maseru'], ['Liberia', 'Monrovia'], ['Libya', 'Tripoli'], ['Liechtenstein', 'Vaduz'], ['Lithuania', 'Vilnius'], ['Luxembourg', 'Luxembourg'], ['Madagascar', 'Antananarivo'], ['Malawi', 'Lilongwe'], ['Malaysia', 'Kuala Lumpur'], ['Maldives', 'Male'], ['Mali', 'Bamako'], ['Malta', 'Valletta'], ['Marshall Islands', 'Majuro'], ['Mauritania', 'Nouakchott'], ['Mauritius', 'Port Louis'], ['Mexico', 'Mexico City'], ['Moldova', 'Chisinau'], ['Monaco', 'Monaco'], ['Mongolia', 'Ulaanbaatar'], ['Montenegro', 'Podgorica'], ['Morocco', 'Rabat'], ['Mozambique', 'Maputo'], ['Myanmar (Burma)', 'Nay Pyi Taw'], ['Namibia', 'Windhoek'], ['Nauru', 'No official capital'], ['Nepal', 'Kathmandu'], ['Netherlands', 'Amsterdam'], ['New Zealand', 'Wellington'], ['Nicaragua', 'Managua'], ['Niger', 'Niamey'], ['Nigeria', 'Abuja'], ['North Korea', 'Pyongyang'], ['North Macedonia (Macedonia)', 'Skopje'], ['Northern Ireland', 'Belfast'], ['Norway', 'Oslo'], ['Oman', 'Muscat'], ['Pakistan', 'Islamabad'], ['Palau', 'Melekeok'], ['Panama', 'Panama City'], ['Papua New Guinea', 'Port Moresby'], ['Paraguay', 'Asuncion'], ['Peru', 'Lima'], ['Philippines', 'Manila'], ['Poland', 'Warsaw'], ['Portugal', 'Lisbon'], ['Qatar', 'Doha'], ['Romania', 'Bucharest'], ['Russia', 'Moscow'], ['Rwanda', 'Kigali'], ['Saint Kitts and Nevis', 'Basseterre'], ['Saint Lucia', 'Castries'], ['Saint Vincent and the Grenadines', 'Kingstown'], ['Samoa', 'Apia'], ['San Marino', 'San Marino'], ['Sao Tome and Principe', 'Sao Tome'], ['Saudi Arabia', 'Riyadh'], ['Scotland', 'Edinburgh'], ['Senegal', 'Dakar'], ['Serbia', 'Belgrade'], ['Seychelles', 'Victoria'], ['Sierra Leone', 'Freetown'], ['Singapore', 'Singapore'], ['Slovakia', 'Bratislava'], ['Slovenia', 'Ljubljana'], ['Solomon Islands', 'Honiara'], ['Somalia', 'Mogadishu'], ['South Africa', 'Pretoria, Bloemfontein, Cape Town'], ['South Korea', 'Seoul'], ['South Sudan', 'Juba'], ['Spain', 'Madrid'], ['Sri Lanka', 'Colombo'], ['Sudan', 'Khartoum'], ['Suriname', 'Paramaribo'], ['Sweden', 'Stockholm'], ['Switzerland', 'Bern'], ['Syria', 'Damascus'], ['Taiwan', 'Taipei'], ['Tajikistan', 'Dushanbe'], ['Tanzania', 'Dodoma'], ['Thailand', 'Bangkok'], ['Togo', 'Lome'], ['Tonga', "Nuku'alofa"], ['Trinidad and Tobago', 'Port of Spain'], ['Tunisia', 'Tunis'], ['Turkey', 'Ankara'], ['Turkmenistan', 'Ashgabat'], ['Tuvalu', 'Funafuti'], ['Uganda', 'Kampala'], ['Ukraine', 'Kiev'], ['United Arab Emirates', 'Abu Dhabi'], ['United Kingdom', 'London'], ['United States', 'Washington D.C.'], ['Uruguay', 'Montevideo'], ['Uzbekistan', 'Tashkent'], ['Vanuatu', 'Port Vila'], ['Vatican City', 'Vatican City'], ['Venezuela', 'Caracas'], ['Vietnam', 'Hanoi'], ['Wales', 'Cardiff'], ['Yemen', "Sana'a"], ['Zambia', 'Lusaka'], ['Zimbabwe', 'Harare'])

countries = ('Afghanistan', 'Albania', 'Algeria', 'Andorra', 'Angola', 'Antigua and Barbuda', 'Argentina', 'Armenia', 'Australia', 'Austria', 'Azerbaijan', 'Bahamas', 'Bahrain', 'Bangladesh', 'Barbados', 'Belarus', 'Belgium', 'Belize', 'Benin', 'Bhutan', 'Bolivia', 'Bosnia and Herzegovina', 'Botswana', 'Brazil', 'Brunei', 'Bulgaria', 'Burkina Faso', 'Burundi', 'Cambodia', 'Cameroon', 'Canada', 'Cape Verde', 'Central African Republic', 'Chad', 'Chile', 'China', 'Colombia', 'Comoros', 'Congo, Democratic Republic of the', 'Congo, Republic of the', 'Costa Rica', "Cote d'Ivoire (Ivory Coast)", 'Croatia', 'Cuba', 'Cyprus', 'Czech Republic (Czechia)', 'Denmark', 'Djibouti', 'Dominica', 'Dominican Republic', 'East Timor', 'Ecuador', 'Egypt', 'El Salvador', 'England', 'Equatorial Guinea', 'Eritrea', 'Estonia', 'Eswatini (Swaziland)', 'Ethiopia', 'Federated States of Micronesia', 'Fiji', 'Finland', 'France', 'Gabon', 'Gambia', 'Georgia', 'Germany', 'Ghana', 'Greece', 'Grenada', 'Guatemala', 'Guinea', 'Guinea-Bissau', 'Guyana', 'Haiti', 'Honduras', 'Hungary', 'Iceland', 'India', 'Indonesia', 'Iran', 'Iraq', 'Ireland', 'Israel', 'Italy', 'Jamaica', 'Japan', 'Jordan', 'Kazakhstan', 'Kenya', 'Kiribati', 'Kosovo', 'Kuwait', 'Kyrgyzstan', 'Laos', 'Latvia', 'Lebanon', 'Lesotho', 'Liberia', 'Libya', 'Liechtenstein', 'Lithuania', 'Luxembourg', 'Madagascar', 'Malawi', 'Malaysia', 'Maldives', 'Mali', 'Malta', 'Marshall Islands', 'Mauritania', 'Mauritius', 'Mexico', 'Moldova', 'Monaco', 'Mongolia', 'Montenegro', 'Morocco', 'Mozambique', 'Myanmar (Burma)', 'Namibia', 'Nauru', 'Nepal', 'Netherlands', 'New Zealand', 'Nicaragua', 'Niger', 'Nigeria', 'North Korea', 'North Macedonia (Macedonia)', 'Northern Ireland', 'Norway', 'Oman', 'Pakistan', 'Palau', 'Panama', 'Papua New Guinea', 'Paraguay', 'Peru', 'Philippines', 'Poland', 'Portugal', 'Qatar', 'Romania', 'Russia', 'Rwanda', 'Saint Kitts and Nevis', 'Saint Lucia', 'Saint Vincent and the Grenadines', 'Samoa', 'San Marino', 'Sao Tome and Principe', 'Saudi Arabia', 'Scotland', 'Senegal', 'Serbia', 'Seychelles', 'Sierra Leone', 'Singapore', 'Slovakia', 'Slovenia', 'Solomon Islands', 'Somalia', 'South Africa', 'South Korea', 'South Sudan', 'Spain', 'Sri Lanka', 'Sudan', 'Suriname', 'Sweden', 'Switzerland', 'Syria', 'Taiwan', 'Tajikistan', 'Tanzania', 'Thailand', 'Togo', 'Tonga', 'Trinidad and Tobago', 'Tunisia', 'Turkey', 'Turkmenistan', 'Tuvalu', 'Uganda', 'Ukraine', 'United Arab Emirates', 'United Kingdom', 'United States', 'Uruguay', 'Uzbekistan', 'Vanuatu', 'Vatican City', 'Venezuela', 'Vietnam', 'Wales', 'Yemen', 'Zambia', 'Zimbabwe')

capitals = ('Kabul', 'Tirana (Tirane)', 'Algiers', 'Andorra la Vella', 'Luanda', "Saint John's", 'Buenos Aires', 'Yerevan', 'Canberra', 'Vienna', 'Baku', 'Nassau', 'Manama', 'Dhaka', 'Bridgetown', 'Minsk', 'Brussels', 'Belmopan', 'Porto Novo', 'Thimphu', 'Sucre', 'Sarajevo', 'Gaborone', 'Brasilia', 'Bandar Seri Begawan', 'Sofia', 'Ouagadougou', 'Gitega', 'Phnom Penh', 'Yaounde', 'Ottawa', 'Praia', 'Bangui', "N'Djamena", 'Santiago', 'Beijing', 'Bogota', 'Moroni', 'Kinshasa', 'Brazzaville', 'San Jose', 'Yamoussoukro', 'Zagreb', 'Havana', 'Nicosia', 'Prague', 'Copenhagen', 'Djibouti', 'Roseau', 'Santo Domingo', 'Dili', 'Quito', 'Cairo', 'San Salvador', 'London', 'Malabo', 'Asmara', 'Tallinn', 'Mbabana', 'Addis Ababa', 'Palikir', 'Suva', 'Helsinki', 'Paris', 'Libreville', 'Banjul', 'Tbilisi', 'Berlin', 'Accra', 'Athens', "Saint George's", 'Guatemala City', 'Conakry', 'Bissau', 'Georgetown', 'Port au Prince', 'Tegucigalpa', 'Budapest', 'Reykjavik', 'New Delhi', 'Jakarta', 'Tehran', 'Baghdad', 'Dublin', 'Jerusalem', 'Rome', 'Kingston', 'Tokyo', 'Amman', 'Nur-Sultan', 'Nairobi', 'Tarawa Atoll', 'Pristina', 'Kuwait City', 'Bishkek', 'Vientiane', 'Riga', 'Beirut', 'Maseru', 'Monrovia', 'Tripoli', 'Vaduz', 'Vilnius', 'Luxembourg', 'Antananarivo', 'Lilongwe', 'Kuala Lumpur', 'Male', 'Bamako', 'Valletta', 'Majuro', 'Nouakchott', 'Port Louis', 'Mexico City', 'Chisinau', 'Monaco', 'Ulaanbaatar', 'Podgorica', 'Rabat', 'Maputo', 'Nay Pyi Taw', 'Windhoek', 'No official capital', 'Kathmandu', 'Amsterdam', 'Wellington', 'Managua', 'Niamey', 'Abuja', 'Pyongyang', 'Skopje', 'Belfast', 'Oslo', 'Muscat', 'Islamabad', 'Melekeok', 'Panama City', 'Port Moresby', 'Asuncion', 'Lima', 'Manila', 'Warsaw', 'Lisbon', 'Doha', 'Bucharest', 'Moscow', 'Kigali', 'Basseterre', 'Castries', 'Kingstown', 'Apia', 'San Marino', 'Sao Tome', 'Riyadh', 'Edinburgh', 'Dakar', 'Belgrade', 'Victoria', 'Freetown', 'Singapore', 'Bratislava', 'Ljubljana', 'Honiara', 'Mogadishu', 'Pretoria, Bloemfontein, Cape Town', 'Seoul', 'Juba', 'Madrid', 'Colombo', 'Khartoum', 'Paramaribo', 'Stockholm', 'Bern', 'Damascus', 'Taipei', 'Dushanbe', 'Dodoma', 'Bangkok', 'Lome', "Nuku'alofa", 'Port of Spain', 'Tunis', 'Ankara', 'Ashgabat', 'Funafuti', 'Kampala', 'Kiev', 'Abu Dhabi', 'London', 'Washington D.C.', 'Montevideo', 'Tashkent', 'Port Vila', 'Vatican City', 'Caracas', 'Hanoi', 'Cardiff', "Sana'a", 'Lusaka', 'Harare')

Let’s also create a dictionary in which the country name is the key, and the capital city is the value, as follows:

countries\_capitals\_dictionary = dict(zip(countries, capitals))

# END HERE

# main.py

This script imports data.py and its variables; it also imports **assignment2.py** and **re**, as follows:

**import assignment2**

**import re**

It also has a main function which calls **write\_countries\_capitals\_to\_file(“0123456789.txt”),** then calls **save\_capitals()**.

# assignment2.py

This script imports data.py and its variables, as follows:

**from data import countries\_and\_capitals, countries, capitals, countries\_capitals\_dictionary  
import re**

This script defines the following functions.

def write\_countries\_capitals\_to\_file (filename)

This function takes one parameter: a filename. The filename is first validated by using a regular expression. Valid filenames must follow these rules:

Must contain only letters or digits.

Must be of length 1-8 characters, plus a “.txt” file extension. For example, these are all valid filenames:

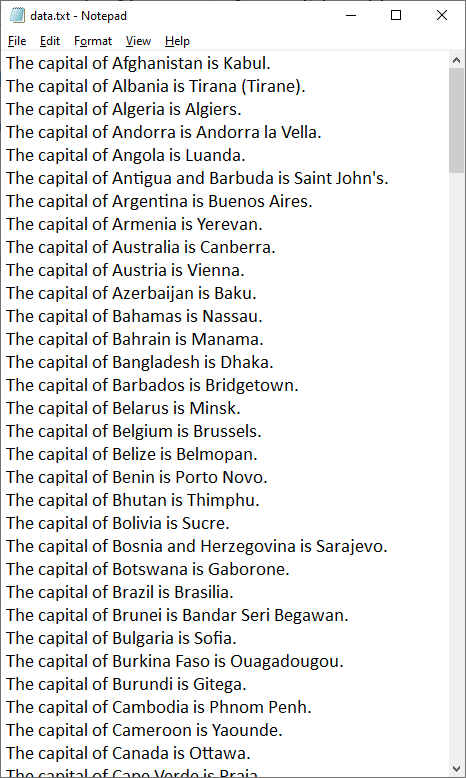
a.txt

5x.txt

AbcE123z.txt

If the filename is not valid, prompt the user for another filename inside the function. This process must continue over and over until the user enters a valid filename. Use a regular expression to validate the filename.

Once the user has entered a valid filename, open the file for writing only, and process the countries\_capitals\_dictionary variable. Use a for/in loop to process the dictionary (**for country, capital in countries\_capitals\_dictionary.items():**) We will use it to write that data in the following format, to the file named by the user:



Then close the file.

def save\_capitals()

This function opens files for writing only. Use regular expressions to find all the capital cities that meet the following patterns, and write them to the files with the following names. Close each file when it’s finished.

|  |  |
| --- | --- |
| **Filename** | **Capitals to store in the file** |
| vowel\_vowel\_vowel.txt | Contain three consecutive vowels |
| cons\_cons\_cons.txt | Contain three consecutive consonants |
| i\_before\_e.txt | Contain i somewhere before e. For example: Ireland |
| a\_a.txt | Start with a, and end with a |
| end\_with\_vowel.txt | End with a vowel |
| weird.txt | Contains apostrophe, space, or x |
| not\_start.txt | Does not start with a-e, l-p, or s |

