QUIZ 1

Part B: Questions to Answer with our Data Software

To answer the following questions, download the CSV file and import it into your data software. The file is a monthly times series from January 1950 to December 2019. Organize your dataset as a time series and assume if needed that the series is a flow variable.

a. What is the average of the series over the whole period? Round your answer to the nearest first decimal.

31.59

b. Create a monthly growth rate series. Then, compute the average monthly growth rate over the whole period in percentage. Round your answer to the nearest second decimal.

0.33

c. Create an annualized monthly growth rate series using the exact formula. Then, compute the average monthly annualized growth rate over the whole period in percentage. Round your answer to the nearest second decimal.

39.80

d. Construct an index base 100 = January 2002. Then compute the average of all indices from October 1992 to January 1996. Round your answer to the nearest second decimal.

34.76

e. Using the log approximation, compute the average anualized growth rate in percentage from November 1976 to October 1980. Round your

Year	Month	Value
1950	1	20.2
1950	2	20.0
1950	3	21.3
1950	4	20.0
1950	5	20.4
1950	6	19.5
1950	7	19.6
1950	8	20.1
1950	9	21.8
1950	10	19.7
1950	11	21.9
1950	12	20.3
1951	1	21.5
1951	2	23.6
1951	3	20.6
1951	4	21.5
1951	5	19.4
1951	6	18.9
1951	7	19.3
1951	8	20.7
1951	9	21.3
1951	10	20.8
1951	11	20.1

November 1976 to October 1980. Round your answer to the nearest second decimal.

34.41

Hint: first, create the monthly growth rate using the log approximation, then annualize the rate using the exact formula)

1951	12	20.6
1952	1	21.0
1952	2	19.7
1952	3	20.7
1952	4	20.2
1952	5	21.6
1952	6	21.2
1952	7	20.9
1952	8	22.0
1952	9	19.7
1952	10	20.3
1952	11	21.6
1952	12	20.9
1953	1	19.7
1953	2	20.3
1953	3	22.3
1953	4	21.5
1953	5	22.1
1953	6	20.6
1953	7	22.3
1953	8	21.2
1953	9	20.8
1953	10	21.8
1953	11	21.7
1953	12	23.4
1954	1	21.7
1954	2	20.3
1954	3	21.2
1954	4	22.6
1954	5	20.7
1954	6	23.3
1954	7	20.2
1954	8	22.0
1954	9	22.4
1954	10	21.0
1954	11	21.0
1954	12	21.0
1955	1	20.1

1955	2	22.4
1955	3	22.4
1955	4	21.2
1955	5	20.4
1955	6	22.6
1955	7	21.8
1955	8	22.1
1955	9	21.2
1955	10	22.5
1955	11	21.5
1955	12	20.1
1956	1	21.9
1956	2	21.6
1956	3	22.3
1956	4	21.8
1956	5	21.3
1956	6	20.9
1956	7	21.8
1956	8	21.9
1956	9	22.2
1956	10	19.9
1956	11	21.0
1956	12	22.1
1957	1	22.9
1957	2	21.8
1957	3	22.7
1957	4	23.9
1957	5	22.4
1957	6	20.9
1957	7	21.4
1957	8	23.1
1957	9	21.6
1957	10	22.9
1957	11	22.5
1957	12	20.6
1958	1	21.6
1958	2	22.0
1958	3	22.7

1958	4	22.6
1958	5	22.8
1958	6	21.9
1958	7	20.5
1958	8	23.1
1958	9	21.8
1958	10	21.9
1958	11	22.9
1958	12	22.8
1959	1	24.5
1959	2	23.1
1959	3	23.5
1959	4	24.1
1959	5	23.3
1959	6	23.5
1959	7	21.5
1959	8	22.7
1959	9	23.6
1959	10	23.3
1959	11	21.1
1959	12	25.6
1960	1	21.7
1960	2	25.0
1960	3	23.7
1960	4	22.1
1960	5	23.5
1960	6	21.4
1960	7	23.2
1960	8	23.0
1960	9	22.2
1960	10	24.1
1960	11	20.9
1960	12	22.6
1961	1	23.2
1961	2	20.2
1961	3	22.0
1961	4	21.0

1961	5	21.2
1961	6	22.8
1961	7	23.6
1961	8	23.0
1961	9	24.2
1961	10	21.9
1961	11	24.2
1961	12	23.6
1962	1	22.6
1962	2	22.4
1962	3	23.1
1962	4	23.0
1962	5	21.1
1962	6	23.3
1962	7	25.0
1962	8	23.7
1962	9	24.5
1962	10	24.7
1962	11	23.6
1962	12	23.0
1963	1	23.0
1963	2	24.9
1963	3	23.4
1963	4	23.6
1963	5	24.4
1963	6	25.4
1963	7	24.2
1963	8	21.9
1963	9	24.2
1963	10	25.9
1963	11	24.0
1963	12	24.7
1964	1	22.9
1964	2	22.8
1964	3	22.5
1964	4	22.8
1964	5	23.1
1964	6	24.6

1964	7	25.5
1964	8	22.8
1964	9	23.9
1964	10	24.6
1964	11	22.7
1964	12	23.1
1965	1	26.0
1965	2	24.6
1965	3	24.8
1965	4	22.3
1965	5	26.3
1965	6	24.2
1965	7	25.8
1965	8	22.1
1965	9	25.1
1965	10	24.1
1965	11	23.3
1965	12	25.9
1966	1	23.9
1966	2	24.2
1966	3	22.4
1966	4	24.3
1966	5	22.6
1966	6	23.7
1966	7	24.5
1966	8	25.4
1966	9	23.0
1966	10	26.1
1966	11	22.4
1966	12	25.6
1967	1	25.3
1967	2	26.1
1967	3	22.4
1967	4	24.5
1967	5	23.6
1967	6	22.5
1967	7	27.3
1967	8	23.1

1967	9	24.0
1967	10	24.2
1967	11	25.3
1967	12	25.0
1968	1	22.8
1968	2	26.1
1968	3	28.2
1968	4	26.6
1968	5	26.2
1968	6	27.8
1968	7	24.5
1968	8	28.9
1968	9	24.8
1968	10	24.1
1968	11	23.7
1968	12	26.0
1969	1	25.4
1969	2	23.5
1969	3	25.3
1969	4	25.5
1969	5	28.4
1969	6	27.5
1969	7	28.1
1969	8	24.9
1969	9	26.2
1969	10	24.3
1969	11	24.6
1969	12	28.5
1970	1	24.4
1970	2	26.5
1970	3	25.7
1970	4	23.9
1970	5	23.7
1970	6	24.7
1970	7	25.8
1970	8	28.9
1970	9	24.6
1970	10	25.6

1970	10	23.6
1970	11	23.5
1970	12	25.0
1971	1	25.2
1971	2	25.9
1971	3	27.3
1971	4	26.3
1971	5	26.9
1971	6	26.7
1971	7	23.8
1971	8	23.6
1971	9	24.4
1971	10	25.8
1971	11	26.4
1971	12	25.4
1972	1	26.4
1972	2	25.7
1972	3	26.0
1972	4	26.8
1972	5	25.8
1972	6	25.2
1972	7	26.7
1972	8	24.9
1972	9	23.8
1972	10	26.5
1972	11	27.6
1972	12	25.5
1973	1	27.7
1973	2	28.1
1973	3	26.4
1973	4	27.9
1973	5	26.3
1973	6	27.0
1973	7	27.7
1973	8	26.3
1973	9	27.4
1973	10	27.1
1973	11	27.2

1973	12	27.2
1974	1	25.1
1974	2	27.7
1974	3	25.7
1974	4	27.1
1974	5	27.7
1974	6	29.6
1974	7	27.1
1974	8	26.0
1974	9	27.3
1974	10	26.2
1974	11	29.4
1974	12	25.0
1975	1	27.0
1975	2	26.7
1975	3	28.8
1975	4	27.7
1975	5	26.6
1975	6	27.1
1975	7	28.1
1975	8	27.4
1975	9	24.4
1975	10	28.9
1975	11	27.0
1975	12	28.0
1976	1	26.0
1976	2	25.5
1976	3	27.7
1976	4	28.8
1976	5	27.9
1976	6	26.8
1976	7	27.7
1976	8	29.1
1976	9	26.7
1976	10	28.0
1976	11	29.4
1976	12	29.0
1977	1	27.6

1977	2	27.4
1977	3	29.7
1977	4	28.5
1977	5	27.8
1977	6	27.9
1977	7	27.2
1977	8	29.8
1977	9	29.0
1977	10	29.1
1977	11	28.9
1977	12	27.3
1978	1	28.3
1978	2	31.5
1978	3	28.0
1978	4	29.2
1978	5	26.4
1978	6	28.5
1978	7	25.3
1978	8	28.3
1978	9	25.2
1978	10	30.0
1978	11	27.6
1978	12	28.4
1979	1	27.8
1979	2	28.2
1979	3	27.4
1979	4	28.8
1979	5	29.3
1979	6	30.3
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1979	8	30.4
1979	9	28.3
1979	10	28.8
1979	11	26.2
1979	12	28.6
1980	1	27.7
1980	2	29.6
1980	3	32.4

1980	4	31.1
1980	5	31.4
1980	6	31.2
1980	7	28.8
1980	8	32.7
1980	9	30.9
1980	10	31.3
1980	11	28.3
1980	12	30.1
1981	1	29.2
1981	2	30.2
1981	3	27.6
1981	4	31.6
1981	5	28.2
1981	6	29.5
1981	7	28.8
1981	8	26.2
1981	9	30.2
1981	10	29.1
1981	11	28.8
1981	12	28.6
1982	1	26.7
1982	2	27.0
1982	3	29.6
1982	4	30.3
1982	5	29.7
1982	6	30.4
1982	7	29.5
1982	8	28.7
1982	9	32.0
1982	10	29.5
1982	11	31.5
1982	12	30.0
1983	1	31.7
1983	2	28.1
1983	3	30.3
1983	4	31.0
1983	5	28.8

1983	5	28.8
1983	6	31.1
1983	7	30.0
1983	8	30.9
1983	9	29.3
1983	10	31.0
1983	11	33.6
1983	12	30.5
1984	1	29.8
1984	2	29.5
1984	3	30.3
1984	4	35.2
1984	5	31.5
1984	6	33.3
1984	7	31.8
1984	8	29.9
1984	9	27.7
1984	10	31.0
1984	11	28.2
1984	12	29.6
1985	1	31.8
1985	2	31.5
1985	3	30.8
1985	4	32.8
1985	5	31.8
1985	6	28.5
1985	7	29.4
1985	8	30.8
1985	9	31.6
1985	10	29.8
1985	11	31.0
1985	12	28.1
1986	1	30.4
1986	2	30.0
1986	3	32.0
1986	4	30.1
1986	5	29.9
1986	6	30.9

1986	7	32.3
1986	8	31.7
1986	9	33.0
1986	10	32.1
1986	11	31.1
1986	12	32.2
1987	1	31.1
1987	2	33.1
1987	3	30.7
1987	4	31.2
1987	5	32.0
1987	6	32.8
1987	7	34.4
1987	8	33.3
1987	9	31.0
1987	10	33.1
1987	11	31.8
1987	12	30.7
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1988	5	31.4
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1988	12	31.5
1989	1	30.3
1989	2	30.9
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1989	4	28.6
1989	5	31.3
1989	6	33.0
1989	7	31.5
1989	8	31.8

1989	9	32.6
1989	10	33.9
1989	11	31.0
1989	12	31.8
1990	1	31.9
1990	2	32.1
1990	3	32.5
1990	4	32.0
1990	5	30.6
1990	6	32.1
1990	7	35.0
1990	8	33.5
1990	9	32.3
1990	10	33.1
1990	11	35.8
1990	12	30.7
1991	1	34.1
1991	2	35.4
1991	3	30.7
1991	4	33.5
1991	5	35.3
1991	6	32.6
1991	7	32.1
1991	8	32.8
1991	9	33.0
1991	10	29.9
1991	11	33.3
1991	12	33.6
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1992	2	33.3
1992	3	32.6
1992	4	32.4
1992	5	32.8
1992	6	34.8
1992	7	36.8
1992	8	32.8
1992	9	32.9
1992	10	36.7

1992	11	34.0
1992	12	34.3
1993	1	35.0
1993	2	33.4
1993	3	35.6
1993	4	31.7
1993	5	34.3
1993	6	36.1
1993	7	32.5
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1993	9	31.6
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1993	12	34.8
1994	1	32.3
1994	2	34.6
1994	3	36.5
1994	4	36.3
1994	5	36.6
1994	6	32.0
1994	7	37.3
1994	8	34.7
1994	9	35.3
1994	10	36.3
1994	11	33.7
1994	12	34.0
1995	1	36.1
1995	2	37.3
1995	3	36.9
1995	4	35.6
1995	5	33.1
1995	6	35.1
1995	7	35.2
1995	8	33.4
1995	9	35.3
1995	10	36.4
1995	11	35.6

1995	12	36.3
1996	1	35.5
1996	2	32.8
1996	3	36.1
1996	4	34.5
1996	5	35.5
1996	6	36.9
1996	7	35.9
1996	8	35.7
1996	9	33.7
1996	10	36.7
1996	11	36.4
1996	12	36.1
1997	1	34.7
1997	2	36.0
1997	3	38.0
1997	4	37.0
1997	5	31.7
1997	6	30.5
1997	7	33.1
1997	8	33.3
1997	9	35.8
1997	10	35.3
1997	11	36.7
1997	12	35.4
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1998	2	39.1
1998	3	37.2
1998	4	35.1
1998	5	35.1
1998	6	35.0
1998	7	34.8
1998	8	37.2
1998	9	36.3
1998	10	32.9
1998	11	32.5
1998	12	34.0
1999	1	37.1

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1999	3	35.8
1999	4	36.6
1999	5	34.2
1999	6	35.3
1999	7	38.4
1999	8	34.5
1999	9	39.0
1999	10	38.6
1999	11	38.1
1999	12	38.4
2000	1	38.5
2000	2	34.6
2000	3	35.6
2000	4	32.5
2000	5	36.3
2000	6	33.5
2000	7	37.7
2000	8	39.0
2000	9	35.7
2000	10	36.5
2000	11	39.5
2000	12	38.2
2001	1	39.7
2001	2	36.1
2001	3	39.3
2001	4	36.1
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2001	8	38.1
2001	9	35.9
2001	10	37.1
2001	11	35.3
2001	12	43.5
2002	1	36.7
2002	2	37.6
2002	3	38.6

2002	4	36.6
2002	5	34.9
2002	6	38.5
2002	7	37.2
2002	8	34.6
2002	9	36.8
2002	10	37.6
2002	11	40.5
2002	12	39.0
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2003	2	40.1
2003	3	36.6
2003	4	40.7
2003	5	37.5
2003	6	34.6
2003	7	34.7
2003	8	39.1
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2004	5	40.8
2004	6	36.6
2004	7	40.1
2004	8	34.9
2004	9	36.3
2004	10	35.1
2004	11	38.0
2004	12	39.4
2005	1	39.4
2005	2	39.9
2005	3	40.3
2005	4	38.7
2005	5	38.3

2005	5	38.3
2005	6	40.9
2005	7	38.7
2005	8	38.6
2005	9	35.5
2005	10	40.3
2005	11	36.7
2005	12	39.1
2006	1	37.1
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2006	3	39.6
2006	4	43.7
2006	5	42.3
2006	6	38.9
2006	7	38.5
2006	8	44.2
2006	9	41.5
2006	10	37.8
2006	11	44.3
2006	12	43.2
2007	1	38.9
2007	2	40.4
2007	3	39.1
2007	4	40.8
2007	5	38.9
2007	6	38.8
2007	7	38.2
2007	8	41.7
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2007	11	39.2
2007	12	42.1
2008	1	38.6
2008	2	42.6
2008	3	39.7
2008	4	42.7
2008	5	40.1
2008	6	40.8

2008	7	40.9
2008	8	39.9
2008	9	39.9
2008	10	39.7
2008	11	39.5
2008	12	41.9
2009	1	40.2
2009	2	36.6
2009	3	41.3
2009	4	41.3
2009	5	41.0
2009	6	45.5
2009	7	47.0
2009	8	44.7
2009	9	41.5
2009	10	42.8
2009	11	41.8
2009	12	42.8
2010	1	43.2
2010	2	38.8
2010	3	41.4
2010	4	41.6
2010	5	39.2
2010	6	42.1
2010	7	44.6
2010	8	43.9
2010	9	39.8
2010	10	45.6
2010	11	43.8
2010	12	38.9
2011	1	40.5
2011	2	42.3
2011	3	42.1
2011	4	41.0
2011	5	43.5
2011	6	40.7
2011	7	42.8
2011	8	45.9

2011	9	44.4
2011	10	45.3
2011	11	44.0
2011	12	39.8
2012	1	44.3
2012	2	38.6
2012	3	45.1
2012	4	40.6
2012	5	43.5
2012	6	46.3
2012	7	40.9
2012	8	41.4
2012	9	45.9
2012	10	41.5
2012	11	39.8
2012	12	40.9
2013	1	44.1
2013	2	45.7
2013	3	43.0
2013	4	45.6
2013	5	42.3
2013	6	42.0
2013	7	46.3
2013	8	45.0
2013	9	40.4
2013	10	41.4
2013	11	43.7
2013	12	44.3
2014	1	45.5
2014	2	46.6
2014	3	46.3
2014	4	44.9
2014	5	39.4
2014	6	46.3
2014	7	42.9
2014	8	43.0
2014	9	43.6
2014	10	42.8

2014	11	42.4
2014	12	42.5
2015	1	44.4
2015	2	43.3
2015	3	42.0
2015	4	45.2
2015	5	44.1
2015	6	43.2
2015	7	45.7
2015	8	43.5
2015	9	42.9
2015	10	42.0
2015	11	42.1
2015	12	42.3
2016	1	48.6
2016	2	46.6
2016	3	43.6
2016	4	46.6
2016	5	45.6
2016	6	42.5
2016	7	44.4
2016	8	45.6
2016	9	47.3
2016	10	42.5
2016	11	46.1
2016	12	42.9
2017	1	44.7
2017	2	44.7
2017	3	42.8
2017	4	47.4
2017	5	42.9
2017	6	43.5
2017	7	49.3
2017	8	47.2
2017	9	43.4
2017	10	43.2
2017	11	41.5
2017	12	45.8

2017	12	45.8
2018	1	44.4
2018	2	42.6
2018	3	46.7
2018	4	47.3
2018	5	45.7
2018	6	46.3
2018	7	48.6
2018	8	42.9
2018	9	44.8
2018	10	45.4
2018	11	48.1
2018	12	46.6
2019	1	45.0
2019	2	44.6
2019	3	47.0
2019	4	47.5
2019	5	47.8
2019	6	46.8
2019	7	45.3
2019	8	41.7
2019	9	44.0
2019	10	48.2
2019	11	47.3
2019	12	47.3