REAL LIFE Applications Assignment – (with technology)

In this activity, you will analyse data from Canadian statistics.

Instructions:
Google E-STAT or go to: www.statcan.gc.ca/estat/licence-eng.htm
Accept (the licence agreement) and Enter
Search CANSIM in E-STAT
Once you've selected the right options, make it give you the table with "CSV - time as rows" so that the table is vertical and can be opened in Excel.

For each of the three topics (see chart below):

1. *Create a scatter plot of the data set using technology*
2. *Find the best regression model for your data, with regression coefficient as close to 1 as you can get it.*
3. *Explain why your data behaves the way it does based on real-world happenings.*

Here are the topics: (Make sure you select the right info from the options provided by the website)

Topic	Years	CANSIM Table Number
Gross Federal Debt	1955 to 1997	385-0010
Consumer Price Index for Food in Ontario	1979 to 2005	326-0002
Gasoline and Motor Fuel Taxes (provincial – Ont)	1989 to 2009	385-0002

Note: if data is given monthly find the YEARLY average before you perform regression.

Some ANSWERS

Governm	Gross federal government debt
1955	17561
1956	18698
1957	17962
1958	18030
1959	19708
1960	20399
1961	20864
1962	22775
1963	24494
1964	26212
1965	26838
1966	27738
1967	29844
1968	32008
1969	34355
1970	35820
1971	39930
1972	43762
1973	46211
1974	49057
1975	55125
1976	61928
1977	69735
1978	82355
1979	100492
1980	110611
1981	127665
1982	144505
1983	173091
1984	209304
1985	250515
1986	284037
1987	318277
1988	349894
1989	379993
1990	406606
1991	444557
1992	476104
1993	514357
1994	557604
1995	595877
1996	634939
1997	651124

Commodi	Food
1979	52.9
1980	58.6
1981	65.1
1982	69.8
1983	73.2
1984	78.1
1985	80.1
1986	83.6
1987	87.3
1988	89.7
1989	93.5
1990	97.3
1991	101.4
1992	100
1993	102.8
1994	102.5
1995	105.8
1996	106.6
1997	107
1998	108.5
1999	110.4
2000	112
2001	117.1
2002	120.7
2003	122.7
2004	125
2005	128.9

Revenue a	Gasoline and motive fuel taxes
1989	1534
1990	1700
1991	1759
1992	1993
1993	2274
1994	2364
1995	2447
1996	2472
1997	2477
1998	2567
1999	2731
2000	2793
2001	2768
2002	2816
2003	3034
2004	2945
2005	3004
2006	3010
2007	3034
2008	3094
2009	3069

Chart 1 (Gross federal government debt):
$y = 10.101x^3 - 59232x^2 + 1E+08x - 8E+10$
$R^2 = 0.9943$

$y = 4E-80e^{0.0983x}$
$R^2 = 0.9693$

$y = -0.7203x^4 + 5703.3x^3 - 2E+07x^2 + 2E+10x - 1E+13$
$R^2 = 0.9977$

$y = 647.93x^2 - 3E+06x + 3E+09$
$R^2 = 0.9885$

Legend: Series1, Expon. (Series1), Poly. (Series1), Poly. (Series1), Poly. (Series1)

Chart 2 (Food):
$y = 0.0065x^3 - 38.862x^2 + 77520x - 5E+07$
$R^2 = 0.9959$

$y = 2.5458x - 4974.9$
$R^2 = 0.9617$

$y = -0.0531x^2 + 214.26x - 215837$
$R^2 = 0.9819$

Legend: Series1, Linear (Series1), Poly. (Series1), Poly. (Series1)

Chart 3 (Gasoline and motive fuel taxes):
$y = 0.1645x^3 - 990.75x^2 + 2E+06x - 1E+09$
$R^2 = 0.9833$

$y = -4.0525x^2 + 16276x - 2E+07$
$R^2 = 0.9797$

$y = 73.621x - 144602$
$R^2 = 0.9002$

Legend: Series1, Linear (Series1), Poly. (Series1), Poly. (Series1)