

Municipal Engineering – Engi 8713
Assignment #1

Census Canada determined that the combined metropolitan areas in Canada had populations of 17,164,331, 18,413,521 and 19,620,366 for the years 1991, 1996 and 2001 respectively. Use this data to solve the problems 1 to 4.

- 1) Use the arithmetic method to estimate the 2011 population for the combined metropolitan areas in Canada.
- 2) Use the constant percentage method to estimate the 2011 population for the combined metropolitan areas in Canada.
- 3) Use the logistic method to estimate the 2021 population and the 2031 population for the combined metropolitan areas in Canada.
- 4) Use the declining growth method to estimate the 2011 population for the combined metropolitan areas in Canada.
- 5) Statistics related to utility connections, school enrollment and telephone connections for City X are given for the years 2000 and 2006 in the first table below. The second table below contains the census records for populations for a number of cities that are similar in economic background, transportation system, time period and location.
 - A) Estimate the population for City X for 2006 based on the statistical data contained in the first table and using a ratio method.
 - B) Using the curvilinear method and the answer obtained in part A) to estimate the population of City X for the years 2016, 2021, 2026 and 2031.

	2000	2006
Utility connections	7,152	8,633
School enrollment	4,478	5,398
Telephone connections	5,589	6,748

Year	City X	City A	City B	City C	City D
1900	1,683		6,908	14,445	
1910	2,029		8,069	20,686	
1920	2,216	5,155	10,400	26,425	9,957
1930	3,291	5,713	12,085	38,500	15,494
1940	4,102	5,036	17,113	52,848	43,132
1950	6,390	13,766	28,256	55,982	51,497
1960	8,908	24,502	38,968	84,706	74,246
1970	12,622	40,050	51,230	97,808	137,969
1980	17,878	45,547	57,770	95,326	144,396
1990	23,583	62,762	70,508	101,261	149,230
2000	28,209	80,215	84,628	108,215	156,815

- 6) The population of a city in 1965, 1985 and 2005 was 15,200, 98,600 and 324,000 respectively. Use the logistic method to estimate the population of this city in 2015. Use logistic graph paper to verify that the logistic method is appropriate for these calculations and that your answer is correct.