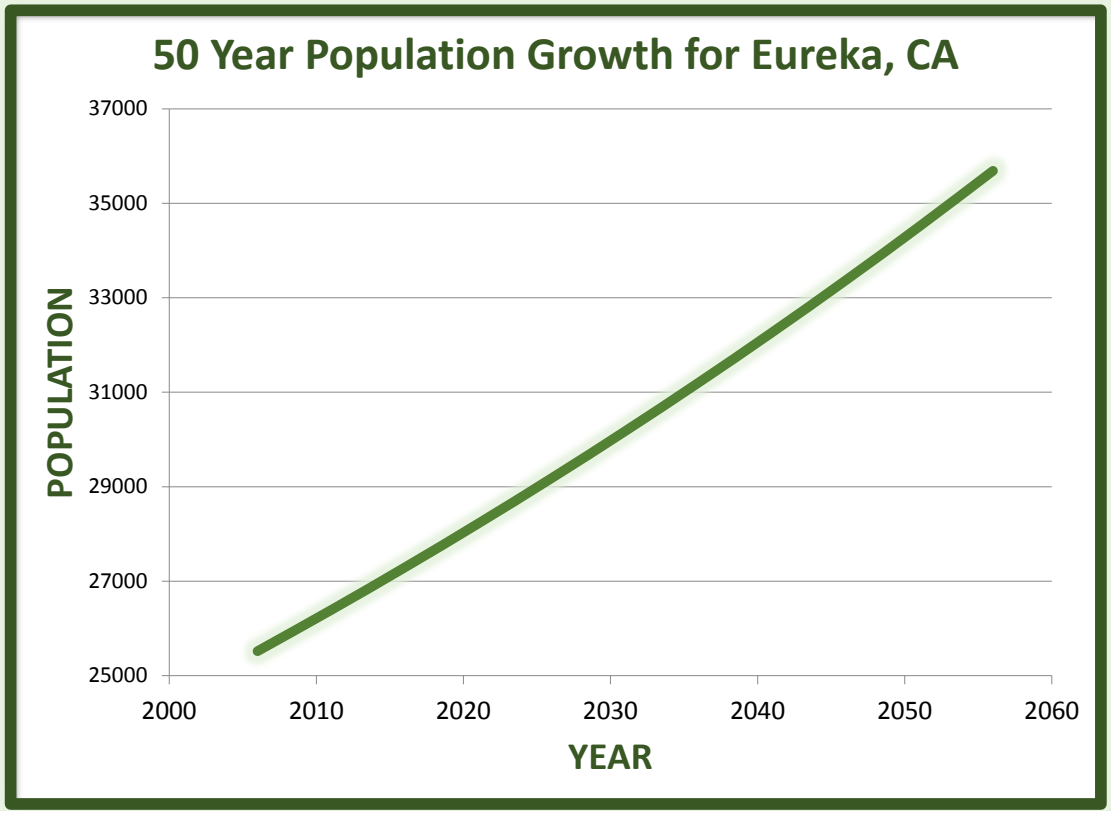
Keann Kline
ENGR 115
2/2/2017
Population Growth Model for Eureka, CA

Input Parameters	
Data Reference	www.wolframalpha.com
Location	Eureka, CA
Model Start Year	2006
Population at Start year (P_0)	25518
Model End Year	2014
Population at End year (Pt)	26925
Delta t	8
Growth Rate (r)	0.0067
Model Time Increment (years)	5

MODEL

Time (actual year)	Time (model year)	Model Population
2006	0	25,518
2011	5	26,389
2016	10	27,289
2021	15	28,220
2026	20	29,182
2031	25	30,178
2036	30	31,207
2041	35	32,272
2046	40	33,373
2051	45	34,511
2056	50	35,689


50 Year Population Growth for Eureka, CA
37000
35000
33000
31000
29000
27000
25000
POPULATION
2000
2010
2020
2030
2040
2050
2060
YEAR

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ENGR 115
42768
Population Growth Model for Eureka, CA

Input Parameters	
Data Reference	https://www.wolframalpha.com/input/?i=eureka,+CA+population+20
Location	Eureka, CA
Model Start Year	2006
Population at Start year (P_0)	25518
Model End Year	2014
Population at End year (Pt)	26925
Delta t	=B12-B10
Growth Rate (r)	=+LN(B13/B11)/B14
Model Time Increment (years)	5

MODEL

Time (actual year)		**Time (model year)**	**Model Population**
=B10	=A20-$A$20		=+$B$11*EXP($B$15*B20)
=A20+$B$16	=A21-$A$20		=+$B$11*EXP($B$15*B21)
=A21+$B$16	=A22-$A$20		=+$B$11*EXP($B$15*B22)
=A22+$B$16	=A23-$A$20		=+$B$11*EXP($B$15*B23)
=A23+$B$16	=A24-$A$20		=+$B$11*EXP($B$15*B24)
=A24+$B$16	=A25-$A$20		=+$B$11*EXP($B$15*B25)
=A25+$B$16	=A26-$A$20		=+$B$11*EXP($B$15*B26)
=A26+$B$16	=A27-$A$20		=+$B$11*EXP($B$15*B27)
=A27+$B$16	=A28-$A$20		=+$B$11*EXP($B$15*B28)
=A28+$B$16	=A29-$A$20		=+$B$11*EXP($B$15*B29)
=A29+$B$16	=A30-$A$20		=+$B$11*EXP($B$15*B30)

QUESTIONS	ANSWERS
1) Use your model to determine the doubling time (rounded to the nearest year) at the growth rate you calculated above. You may need to increase the number of years Excel calculates to determine this on your model page. Check your model prediction with the hand calculation you did at the beginning of lab. State the doubling time from your hand calculation and the double time provided by your model. Does the doubling time from your model match the doubling time from your hand calculation?	The doubling time from my hand calculation was 103 years. When I adjusted my model data to determine the doubling time, it showed that this would occur in the year 2109. Therefore, my hand calculation and model both predict the exact same doubling time.
2) What growth rate would you recommend for your chosen place? Justify your recommendation as much as possible using the information you have on your chosen area and simulations you run using your spreadsheet model. One way to start could be by suggesting a carrying capacity for your place and adjusting the growth rate so that the capacity is not exceeded over a 50-year period. Be sure to include this carrying capacity value in your justification	I would recommend the current growth rate of 0.0067 for Eureka, CA. This growth rate is incredibly small. Given the fact that it will take 103 years for the population of Eureka, CA to double, I certain cannot justify a reason to lower it.
3) Does an exponential growth model seem like a reasonable model for human population growth? Why or why not?	I believe that an exponential growth model is a reasonable model for human population **only** when measuring localized regions. There are a number of factors that can influence the model. These factors will greatly affect the growth rate when the data is modeling a larger population. For example, with a breakthrough in medicine affecting pneunomia patients, my model and growth rate for Eureka, CA will not change much because the number of people surveyed is so small. However, the model for a larger population, say the whole United States, would change drastically.