

CalculatedRisk.java

Polynomials are used as models of plenty of risky behaviors. How many AIDS cases in the US are likely in 2017? If an hour has passed, what is the concentration of a specific drug in my blood? What will be the US population in 2020? How much toxin is present at a point downstream from a factory (depending on the hour of the day)? etc.

Your teacher will assign you a polynomial to work with in class.

- A. estimated no of AIDS cases = $345.14t^2 - 1705.7t + 42904$
t = time since a population is exposed (years)
- B. concentration of drug in blood = $0.003x^3 - 0.093x^2 + 0.504x$.
x = time since drug was taken (hours). Drug concentration is in mg/dL.
- C. pop of disease-ridden birds = $0.002x^3 + 0.024x^2 - 5.3x + 9.2$
x = days since the disease began in the population
- D. Number of lung cancer cases per 1000 females = $0.00028t^3 - 0.011t^2 + 0.23t + 0.93$
t = years since 1930 (t = 0 in 1930)
- E. Toxin concentration = $-0.006x^4 + 0.23x^3 - 0.07x^2 + 0.03x$
x = hour of the day (a value between 0 and 24), concentration is in ppm
- F. Concentration of radioactive dye in blood = $-0.006x^4 + 0.140x^3 - 0.53x^2 + 1.79x$
x = time (seconds) since dye was injected. Concentration is in mg/dL.
- G. pop in US (in millions) = $0.008597t^2 + 1.1738t + 76.41$
t = years since 1900

In general, write variable/method names using appropriate naming conventions, including meaningful names!

- Write main – you should have a variable to receive the value when you call your input method, then pass that value to the calculation method, which will return the calculated number. (You need to receive that number). Then both these numbers will be sent to a method that will print a clear sentence.
- Write a method for obtaining input. Be sure to use Scanner with the appropriate method for reading the input then return the value to main.
- Write a method for the outcome (dependent variable) when the independent variable (input) is provided. This method will calculate the outcome using the parameter that was passed. Use constants (no magic numbers). Use a method from the Math class as described on your handout in class.
- Write a method that clearly prints with context, using reasonable formatting (printf only!) based on your type of information.

This program uses only local variables. There are no field variables.

Your program needs thorough documentation (pseudocode). Include a testing plan with specific sample values and thorough coverage of data types you would use in testing. A natural question is: Should the output number be a decimal or an int? Answer: It depends on your topic and what makes sense!

Sample output for G. Input is in bold.

This estimates the population of the US after 1990.
Enter the number of years since 1900: **117.8**

The population of the US in 117.80 years after 1990 is about 57.44 million.