Practical 1 : Elements of Programs

Question One: Fast but not Furious

Write a program that inputs the initial velocity of a car, its acceleration, and time and then output its final velocity. The equation of motion to calculate this is: $v = v_0 + at$

Question Two: Volume Calculator

Write a program that inputs the radius and the length of a cylinder and then calculates and outputs the volume of the cylinder. The volume of a cylinder is given by:

$$area = radius^2 \times \pi$$
$$volume = area \times length$$

Use $\pi = 3.14$

Question Three: Weighty Issues

Write a program that converts pounds to kilograms. Your program should input the number of pounds from the user and should output the equivalent number of kilograms. One pound is 0.454 kilograms.

Question Four: Farming

A farmer has a field *B* meters wide, *L* meters long.
The field yields *C* cubic meters of grain per hectare (1 hectare = 10000 square meters). The farmer has a number of cylindrical grain silos, *R* meters in radius, *H* meters in height in which he stores the harvest. Write a program which reads *B*, *L*, *C*, *R*, *H* and outputs the number of completely filled silos and the height of grain in any unfilled silo.

Question Five: Debt

In order to pay off in *N* years a mortgage of *P* on which interest is charged at an annual rate of *R*% and computed annually, *A* must be repaid every year where:

$$A = \frac{P \times (1+r)^N \times r}{(1+r)^N - 1} \text{ and } r = \frac{R}{100}$$

Write a program which reads in *P*, *N* and *R* and outputs *A*.

Question Six: Holiday Time

It is possible to name the days 0 through 6 where day 0 is Sunday and day 6 is Saturday. If you go on a wonderful holiday leaving on day number 3 (a Wednesday) and you return home after 10 nights, then you would return on Saturday. Write a general version of the program which asks for the starting day number, and the length of your stay, and it will tell you the number of day of the week you will return on.
HINT: Use the % operator.