Repetition Assignment

Marks: 20

Due:

The following set of programs are to completed by the end of class on the due date. They are to uploaded all at once. They must include good comments.

1. Write a program that continues to ask for a password until the right password is given, then gives some comment. (3 marks)
2. Given that the current world population is 8.017 billion and increasing at the rate of 0.9% per year, calculate the number of years it would take for the world population to double at the current rate. (3 marks)

3. Write a program that displays a fast-food menu. The last option should be exit. Your program will calculate the total of all the food purchases. Also, get your program to ask, "Would you like fries with that?" before exiting, if they did not already buy fries (5 marks)

   It should look something like this when run.

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---- HEART ATTACKS ON A BUN -----
1.    The Big MOO Combo . . . 5.99
2.    Big MOO . . . . . . . . 3.99
3.    Spring Surprise . . . . 1.99
4.    Fries . . . . . . . . . 1.29
5.    Pop . . . . . . . . . . 1.19
6.    Exit
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What would you like? 2
What would you like? 3
What would you like? 6
Would you like any fries with that [y/n] ? n
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   Your total is $5.98

4. Multiplying the digits of an integer and continuing the process gives the surprising result that the sequence of products always arrives at a single-digit number. For example:

   $715 \rightarrow 35 \rightarrow 15 \rightarrow 5$

   $88 \rightarrow 64 \rightarrow 24 \rightarrow 8$

   $27 \rightarrow 14 \rightarrow 4$

   The number of products necessary to reach the single-digit number is called the **persistence number** of that integer. Thus 715 and 88 have a persistence number of 3, while 27 has persistence 2.
   Make a program to find the only two-digit number with persistence greater than 3? (5 marks)

5. From a collection of 10,000 cannonballs, a square-based pyramid is built with a single cannonball on top and a square number on each layer. How many layers can be made? How many cannonballs are left over? (This question is hard, start by doing some problem solving. Make a chart that tracks all important information as you would try to develop the pyramid from scratch) (4 marks)