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Assignment 1 Solutions:

Problem 1:
The java implementation of this algorithm is in Problem1.java.
This is the algorithm for problem 1:
Let year = 0, interest = 0, balance = 1000, rate = 5%.

Repeat the following steps while year < 3:
	Add 1 to year (year++).
	Compute interest = balance * 0.05.
	Set balance = balance + interest.
	Print the balance for the current year.

Problem 2:
Let a_0 be the initial guess of a_0.
Let $a_1 = 0.5 * (a_0 + a / a_0)$ be the next guess.
Let $a_{k+1} = 0.5 * (a_k + a / a_k)$ be the next guess in the sequence $\{a_0, ..., a_k\}$.
Let a_n, a_{n+1} denote two consecutive guesses.

Let t be the tolerance for which $|a_{n+1} - a_n| < t$ allows us to deduce that our current
guess is "close enough".

Algorithm:
Decide on a "precision" or threshold that bounds the error of each consecutive guess.
Start with an initial guess of $a_0 = a/2$.

Start Guess Loop:
	Make the next guess being $a_{k+1} = 0.5 * (a_k + a / a_k)$.
	If $|a_{k+1} - a_k| < t$ (two consecutive guesses are close enough), then output a_{k+1}, our current guess.
	Otherwise, go to the top of the current loop.

Problem 6:

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double x = 2.5;
double y = -1.5;
int n = 17;
int m = 18;
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a)	x + n * y - (x + n) * y = 2.5 + 17 * (-1.5) - (2.5 + 17) * (-1.5)
	= 6.25

b) m / n + m % n = 18 / 17 % 17
	= 2

c) n % 2 + m % 2 = 17 % 2 + 18 % 2
	= 1

d) (m + n) / 2 = (17 + 18) / 2
	= 17

e) (m + n) / 2.0 = (17 + 18) / 2.0
	= 17.5

f) (int) (0.5 * (m + n)) = (int) (0.5 * (17 + 18))
	= 17

g) 1 - (1 - (1 - n)) = 1 - (1 - (1 - 17))
	= -16

h) n % 10 + (n - (n % 10)) = 17 % 10 + (17 - (17 % 10))
= 17