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3.3-3.5, 6.1 Journal

1. The code for four recursive programs are on the following pages:

      a. • fact() on page 118

      b. • rabbit() on page 137

      c. • binarySearch() on page 147

      d. • solveTowers() on page 156

Review the code for each recursive program above, and answer the following questions.

a. What is the greatest similarity among all four recursive programs? Briefly explain you answer.

The greatest similarity is that they all use a base case (a condition that is checked at the beginning of a recursive function call).

b. What is the greatest difference among all four recursive programs? Briefly explain you answer.

The greatest difference is that they are different types of problems. Factorial and Fibonacci are mathematical algorithms, and the other two are problem solving algorithms.

c. For each, identify the "base case" as described in the Key Concepts box on page 116.

For factorial the base case is when n is equal to 0, for rabbit the base case is when n is less than or equal to 2, for binarySearch the base case is when the size of the array is 1, and for solveTowers the base case is when count is equal to 1.

2. The Eight Queens Problem is described in section 6.1. Clearly explain why it is a good candidate for a recursive solution. (You might consider using the four questions on page 116 as a guide.)

It is a good candidate because according to the questions provided on page 116, the problem can be divided into smaller subproblems, each recursive call solves a smaller subproblem, each recursive call

makes progress towards the case case, and the algorithm ensures that the base case will eventually be reached.