1. Evaluate $\text{Comp}[\text{plus}, \ p_3^3, \ C_{10}^3](3, 5, 7)$

2. Evaluate $\text{Comp}[\text{mult}, \ Comp[\text{succ}, \ p_7^2], \ Comp[\text{succ}, \ p_2^3]](7, 2)$

3. Evaluate $\text{Pr}[p_4^1, \ Comp[\text{succ}, \ p_2^3]](10, 20)$

4. Evaluate $\text{Pr}[C_8^2, \ Comp[\text{plus}, \ p_2^4, \ p_4^1]](4, 3, 2)$

5. Show that monus$(x^2, 5x)$ is primitive recursive by writing it in canonical notation.

6. Write a program to compute Ackermann’s function, as described in problem 3.3.1c in the textbook, and test it on some very small arguments.

   Scheme is an excellent choice for writing this program, and Prolog is a good second choice, if you remember these languages. My Scheme solution was 4 lines long, and my Prolog solution was 3 clauses long. On our system, scheme48 is able to handle larger arguments than SWI-Prolog before it runs out of stack space. What happens when you run your program on $(3, 5)$? on $(4, 1)$?

   I will give discussion-home work credit to each student who turns in a printed program listing and sample run for this problem. (Please work alone on this problem.)

7. Solve problem 3.3.6 from the textbook.

8. Solve problem 3.3.8 from the textbook.

   Note: Taylor uses the term partial function to mean a function that is undefined somewhere, and the term total function to mean a function that is defined everywhere. (See the definitions on p. 11 of the textbook.) Earlier in the semester, I gave you a slightly different definition of partial function: a partial function may be undefined somewhere (but does not need to be undefined anywhere). Unfortunately, both definitions are in use in the literature. For this problem, use Taylor’s definition.