CSE547

Chapter 2, Problems 8

Chapter 2, Problem 8
Question.

What is the value of 0^m,

when m is a given integer?

Chapter 2, Problem 8
Definition of $x^{\underline{m}}$ and $x^{\underline{-m}}$

- $x^{\underline{m}} = x(x-1)...(x-m+1)$

  From: (2.43) Concrete Mathematics

  A Foundation for Computer Science

  Graham, Knuth, Patashnik

- $x^{\underline{-m}} = 1/[(x+1)(x+2)...(x+m)]$

  From: Lecture Notes 9

Chapter 2, Problem 8
For m >= 1

- For m>=1 we use the definition $x^{\underline{m}} = x(x-1)...(x-m+1)$.

- x = 0 will always give us a product of 0.

$$0 = 0(0-1)\ldots(0-m+1)$$

Chapter 2, Problem 8
For m <= 0

- For m>=1 we use the definition x^{-m} = 1/[(x+1)(x+2)...(x+m)].

- 0^{-m} = 1/[(0+1)(0+2)...(0+|m|)]
  = 1/[1*2*...*|m|]
  = 1/(|m|!)

Chapter 2, Problem 8 Conclusion.

What is the value of $0^{\underline{m}}$,

when m is a given integer?

0, if m>=1;

1/(|m|!), if m<=0.