Homework Questions

1. Given the partial paid claims triangle below, fill in the missing parts using the chain ladder method. Assume claims develop over a period of four years and that development factors are consistent over time. To find loss development factors, use an arithmetic mean.

Accident Year	Year 1	Year 2	Year 3	Year 4
2016	10,000	5,000	3,000	1,000
2017	12,000	5,500	2,000	-
2018	13,000	6,000	-	-
2019	14,000	-	-	-

2. For the cumulative claims triangle below, calulate the loss development factor for going from development year 1 to development year 2 using three different methods: volume weighted mean [1.535], xHiLow mean [1.580], and geometric mean [1.520].

Accident Year	Year 1	Year 2	Year 3	Year 4	Year 5
2016	9,000	15,000	18,000	21,000	22,000
2017	12,000	19,000	22,500	24,000	-
2018	13,000	20,500	24,500	-	-
2019	15,000	20,000	-	-	-
2020	15,000	-	-	-	-

3. The loss development factors are shown for four years in the following table.

Development Year Ratio	LDF
1/0	1.5
2/1	1.3
3/2	1.15
4/3	1.1
$\infty/4$	1.02

We know the following Given the following data:

- Expected loss ratio: 60%
- Earned premiums for the current year: $1,500,000
- Total paid for losses in the current calendar year: $410,000

Using the chain ladder method [621,594], expected claims method [490,000], and Bornhuetter-Ferguson method [542,301], calculate the reserves needed for the current year.

4. This table outlines payments made and case reserves set aside for accident years across different calendar years.

Calendar Year	Accident Year	Payments Made	Case Reserves
2015	2015	$50,000	$20,000
2016	2015	$10,000	$15,000
2016	2016	$60,000	$36,000
2017	2015	$6,000	$10,000
2017	2016	$30,000	$14,000
2017	2017	$55,000	$32,000
2018	2015	$5,000	$5,000
2018	2016	$10,000	$10,000
2018	2017	$20,000	$18,000
2018	2018	$70,000	$25,000

Create 2 different claims triangle based on this information. One for reported claims, one for paid claims.

5. Discuss the differences between a claims triangle that uses paid claims data versus one that uses reported claims data. What is the difference between what you would call the unknown parts of the claims triangle.