Stat 346 Homework #9

Homework Questions

1. Policy A was written prior to 2010. Policy C was written on 01/01/2011, but individuals purchase 1 year policies at any time during the year. Find the following using the claim detail from the table below:

   - AY 2010 reported (incurred) claims @ 12/31/2010
   - AY 2010 reported (incurred) claims @ 12/31/2011
   - CY 2011 reported (incurred) claims
   - PY 2010 reported (incurred) claims @ 12/31/2011

Accident Date	Transaction Date	Claim Status	Payment	Case Reserve
Claim 1 (Policy A)				
01/01/2010	01/20/2010	Open	$500	$1000
	02/05/2010	Open	$1000	$1000
	01/10/2011	Closed	$1500	
Claim 2 (Policy A)				
01/15/2011	01/25/2011	Open	$300	$800
	02/15/2011	Open	$200	$800
	08/05/2011	Open	$400	$500
Claim 3 (Policy C)				
04/01/2011	09/15/2011	Open	$600	$1200
	10/10/2011	Open	$700	$700
	11/05/2011	Open	$800	$400
	12/10/2011	Open	$900	
	01/05/2012	Closed	$1000	

2. You know that reported claims for the last few years follow this claims triangle: You also know the

Claims Triangle			
Accident Year	**DY0**	**DY1**	**DY2**
2022	120	180	240
2023	150	200	
2024	170		

   following:

   - The permissible loss ratio is 80%.
   - The trend factor for exponential claims growth is $\delta = 0.07$.
   - The first two loss development factors for losses are estimated to be 1.35 and 1.30.
   - Assume no additional losses from years prior to 2022 and no tail factor.

   What should the rate be based on the loss cost method for a new one-year policy starting in 2025?

3. The following earned premiums were calculated for the specific years given in the table:

Calendar Year	Earned Premium ($)
2017	1,800,000
2018	2,000,000
2019	2,200,000

During this time, rates were subjected to the following rate changes:

Rate Change	Effective Date	Percentage Change
1	September 1, 2017	10%
2	April 1, 2018	15%

Table 1: Rate changes during the calendar years

Assume that rate changes are applied proportionally to the remaining part of the year from the date they take effect and that all policies are 1-year policies. Other actuaries have determined that expected effective losses for 2020 are 1,600,000 and fixed expenses are 150,000. The permissible loss ratio is 80%. The current average rate per exposure unit is 1100. Based on this information, use the loss ratio method to determine rates for the 2020 year.

4. You are given the following information:

Item	**Value**
Expected Effective Losses (Trended and Developed)	$500,000
Exposure Units	10,000
Earned Premium at Current Rates	$700,000
Current Average Premium	$70
Fixed Expenses	$100,000
Fixed Expenses per Exposure Unit	$10
Permissible Loss Ratio	80%

You need to find the new rate based on the loss cost method and the loss ratio method.