Given the following model:

\[ r = f \cdot p \quad \text{and} \quad p = \exp(a)/(1+i)^{f^\beta} \]

Where:
- \( r \) = Monthly revenue ($)
- \( p \) = No. of passengers/month
- \( i \) = rainfall (inches)
- \( f \) = fare ($), and
- \( a \) and \( \beta \) are parameters

Experience has shown that:
- @ \( i = 1.0'' \), \( f = $1.5 \) and \( p = 20,000 \) passengers/month
- @ \( i = 1.5'' \), \( f = $2.0 \) and \( p = 10,000 \) passengers/month

Develop all the model parameters.

2. The city has a policy that fare \( T \) must be contained within a range of $1.25 and $3.00. Next month expected rainfall is 0.75". Compute the expected revenue at \( f = $1.75 \).

3. What must be the fare if you want to double your revenue from problem 2? Is that fare implementable? What is the maximum possible revenue you can generate under the given fare policy?

4. Suppose you want to "fine tune" the above model as follows to account for 2 groups of passengers \( P_1 \) and \( P_2 \), as follows:

\[ p_1 = \exp(0.95 \cdot a)/(1+i)^{f^\beta} \]

\[ p_h = \exp(0.85 \cdot a)/(1+i)^{f^{0.75} \cdot \beta} \]

Use the \( a \) and \( \beta \) values already derived to compute the total revenue at \( i = 0.75'' \) and \( f = $1.75 \) (note: Subscripts 'l' and 'h' are for low and high income groups).

*Note: Late submissions will be penalized 20% per week.*
5. Establish your proposed fare if you want to double your revenue from problem
4. Is this implementable? What is the maximum revenue that you can
generate from the above 2 groups under the given fare policy?

6. Relate your approach to various stages of problem solving described through
figure 2.1 of your text.

7. For the goal of increasing the accessibility of the physically challenged to job
opportunities, develop and explain in detail four possible objectives and
corresponding MOE's.

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