a/s/m

Actuarial Study Materials

Learning Made Easier

Flashcards for SOA Exam SRM

2nd Edition

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Introductory Note for ASM Flashcards for Exam SRM

These flashcards will help you remember important formulas and concepts for Exam SRM. This introduction discusses the features of the cards.

On the back of each card, the left header states the broad topic for the card's content.

The left footer provides a cross-reference to the lesson number, page number, and table or formula number where applicable, of the second edition of the ASM SRM manual.

On both the front and the back of each card, the right header indicates the importance of the card. The rating system is given in Table 1.

These flashcards are based on the ASM SRM manual 2nd edition. The pagination of the 1st edition (both printings) is different, but the lessons and formula numbers are the same.

While flashcards are a useful study aid, they do not replace working out tons of exercises. Flashcards are limited to formulas or concepts that can be expressed briefly on a card. The number of flashcards for a topic

depends on the number of formulas for that topic, but is not necessarily a measure of the importance of a topic.

If you find any errors in these cards, check the errata list at

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When you send errata in, identify this publication as "SRM Flashcards, 2nd edition".

Table 1: Rating system

Exam SRM is fairly new, so ratings are somewhat speculative.

★★★★★	Essential—appears repeatedly on every exam
★★★★	Important—appears on every exam
★★★	Average importance—regularly appears on exams
★★	Not so important—appears occasionally on exams, or easy to derive as needed
★	Obscure—on syllabus, but unlikely to appear on exam. No released exam uses this formula or concept, and students have never reported a question from an unreleased exam requiring this formula or concept.

★★★

Three types of variables

1. *Continuous*
2. *Categorical*
3. *Count*

★★

Box-Cox transformation

$$Y^* = \begin{cases} \dfrac{Y^\lambda - 1}{\lambda} & \lambda \neq 0 \\ \ln Y & \lambda = 0 \end{cases}$$

★★★

Homoscedasticity

The variance of error term of a linear regression is the same.

★★★

Formula for $\hat{\beta}_0$ and $\hat{\beta}_1$ of linear regression

$$\hat{\beta}_1 = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2} \quad (2.1)$$

$$\hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \bar{x} \quad (2.2)$$

★★

Formula for $\hat{\beta}_1$ of linear regression in terms of variance and covariance

$$\hat{\beta}_1 = \frac{cv_{xy}}{s_x^2}$$

★★★

Formula for $\hat{\beta}_1$ of linear regression in terms of correlation

$$\hat{\beta}_1 = r_{xy}\frac{s_y}{s_x}$$

★★

Formula for $\hat{\boldsymbol{\beta}}$ in multiple regression

$$\hat{\boldsymbol{\beta}} = (\mathbf{X}'\mathbf{X})^{-1}\mathbf{X}'\mathbf{y}$$

★★

Formula for $\hat{\boldsymbol{\beta}}$ in weighted least squares

$$\hat{\boldsymbol{\beta}}^{*} = (\mathbf{X}'\mathbf{W}\mathbf{X})^{-1}\mathbf{X}'\mathbf{W}\mathbf{y}$$

★★★

Residual sum of squares

$$Error\ SS = \sum_{i=1}^{n} (y_i - \hat{y}_i)^2$$

★★★

Total sum of squares

$$Total\ SS = \sum_{i=1}^{n}(y_i - \bar{y})^2 = \sum_{i=1}^{n} y_i^2 - n\bar{y}^2$$