R300 Econometrics

Metrics Enjoyers

Michaelmas Term, 2023-2024

Contents

1 Lecture 1: Basic Probability. Conditional expectation function.

1.1 Review of continuous distributions

Definition 1.1.1: Cumulative distribution function

The cumulative distribution function of X is defined as $F_X(x) \equiv P(X \leq x)$. By the Fundamental Theorem of Calculus, $\frac{d}{dx}F_X(x) = f_X(x)$ for a continuous r.v. at continuity points of f_X. A function F is a cdf iff:

1. $\lim_{x\to-\infty} F(x) = 0$ and $\lim_{x\to\infty} F(x) = 1$;
2. $F(\cdot)$ nondecreasing;
3. $F(\cdot)$ right-continuous; i.e., $\forall x_0$, $\lim_{x\downarrow x_0} F(x) = F(x_0)$.

1.2 Conditional expectation function (CEF)

1.2.1 Conditional quantile function

2 Causal interpretation of regression. Least Squares.

2.1 Regression and causality

2.2 Estimating population regression by least squares

Theorem 2.2.1. This is a theorem.

Proof. This is a proof. □

Example. This is an example.

Proof. This is an explanation. □

Claim 2.2.1. This is a claim.

Corollary 2.2.1. This is a corollary.

Proposition 2.2.1. This is a proposition.

Lemma 2.2.1. This is a lemma.

Question 1

This is a question.

Solution:-

This is a solution.

Question 2

This is another question.

Solution:-

This is another solution.

Exercise 2.2.1. This is an exercise.

Definition 2.2.1: Test

This is a definition.

Note:-

This is a note.