Title

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November 13, 2021

1 PDF CDF and Survival Function

$$h(t) = \frac{f(t)}{S(t)} \tag{1}$$

$$f(x) = PDF \quad F(x) = CDF \quad S(x) = 1 - F(x) \tag{2}$$

$$F(x) = \sum_{i=1}^{t} P(X = t) \tag{3}$$

$$P(X = 1) = \frac{1}{6} \tag{4}$$
$$P(X = 2) = \frac{1}{6} \tag{5}$$
$$P(X = 3) = \frac{1}{6} \tag{6}$$
$$P(X = 4) = \frac{1}{6} \tag{7}$$
$$P(X = 5) = \frac{1}{6} \tag{8}$$
$$P(X = 6) = \frac{1}{6} \tag{9}$$

$$F(X = 1) = \frac{1}{6} \tag{10}$$
$$F(X = 2) = \frac{2}{6} \tag{11}$$
$$F(X = 3) = \frac{3}{6} \tag{12}$$
$$F(X = 4) = \frac{4}{6} \tag{13}$$
$$F(X = 5) = \frac{5}{6} \tag{14}$$
$$F(X = 6) = 1 \tag{15}$$

$$F(x) = \int_{-\infty}^{x} f(t)dt \tag{16}$$

$$Y = X\beta + \epsilon \tag{17}$$

$$\begin{pmatrix} y_1 \\ \vdots \\ y_n \end{pmatrix} = \begin{pmatrix} x_{11} & \dots & x_{p1} \\ \vdots & \ddots & \vdots \\ x_{1n} & \dots & x_{pn} \end{pmatrix}^T \times \begin{pmatrix} \beta_1 \\ \vdots \\ \beta_p \end{pmatrix} + \begin{pmatrix} \epsilon_1 \\ \vdots \\ \epsilon_n \end{pmatrix} \tag{18}$$

$$y_1 = x_{11} \times \beta_{11} + x_{12} \times \beta_2 \dots x_{p1} \times \beta_p + \epsilon_1 = \sum_{i=1}^{p} \beta_i \times x_{i1} + \epsilon_1 \tag{19}$$

$$h(t) = h_0(t) \times e^{X\beta+\epsilon} \tag{20}$$

$$= h_0(t) \times e^{X\beta} \times e^{\epsilon} \qquad e^{a+b} = e^a \times e^b \tag{21}$$

$$= h_0'(t) \times e^{X\beta} \qquad h_0'(t) = h_0(t)e^{\epsilon} \tag{22}$$

$$\frac{h(t)}{h_0'(t)} = e^{X\beta} \tag{23}$$

$$\ln\left(\frac{h(t)}{h_0'(t)}\right) = \ln e^{X\beta} = X\beta \qquad log_e^{e^a} = a \tag{24}$$