Tabricio Ilencos

202106009

Tarea I: reducción de datos

Roblema 1:

$$\Delta x = \sum_{i=1}^{n} \frac{\partial x}{\partial U_{i}} \Delta U_{i}$$

a) Sea $x = AU$, entonces $\Delta x = A\Delta U$

Tenemos que: $\partial x = \frac{\partial (AU)}{\partial U_{i}}$
 $\partial x = \frac{\partial x}{\partial U_{i}} \Delta U_{i}$
 $\partial x = \frac{\partial x}{\partial U_{i}} \Delta U_{i}$
 $\partial x = A\Delta U$
 $\partial x = A\Delta U$

b) Sea
$$\chi = Au + Bv$$
, entonces $\Delta \chi = A\Delta u + B\Delta v$

Tenemos que:
$$\frac{\partial x}{\partial U_i} = \frac{\partial}{\partial U_i} (AU + BY)$$
 $\frac{\partial x}{\partial U_i} = A \frac{\partial U}{\partial U_i} + B \frac{\partial Y}{\partial U_i}$

• Por lo tanto:
$$\Delta x = \sum_{i=1}^{n} \frac{\partial x}{\partial U_{i}} \Delta U_{i}$$
• $\Delta x = \sum_{i=1}^{n} \left[A \frac{\partial U}{\partial U_{i}} + B \frac{\partial v}{\partial U_{i}} \right] \Delta U_{i}$

$$\Delta \chi = \left[A \sum_{i=1}^{n} \frac{\partial U}{\partial U_{i}} \Delta U_{i} \right] + \left[B \sum_{i=1}^{n} \frac{\partial \gamma}{\partial U_{i}} \Delta U_{i} \right]$$

() Sea
$$x = uy$$
, entonces $\frac{\Delta x}{x} = \frac{\Delta u}{u} + \frac{\Delta v}{v}$

$$\Delta \mathcal{X} = \left[\mathcal{A} \underset{i=1}{\overset{\sim}{\searrow}} \frac{\partial U}{\partial U_{i}} \Delta U_{i} \right] + \left[\mathcal{B} \underset{i=1}{\overset{\sim}{\searrow}} \frac{\partial Y}{\partial U_{i}} \Delta U_{i} \right]$$

$$\Delta \mathcal{X} = \mathcal{A} \Delta U + \mathcal{B} \Delta Y \bullet$$

Tenemos que:
$$\Delta \chi = \sum_{i=1}^{n} \left[\gamma \frac{\partial U}{\partial U_i} + U \frac{\partial \gamma}{\partial U_i} \right] \Delta U_i$$

$$\Delta \chi = \left[\sum_{i=1}^{n} \gamma \frac{\partial U}{\partial U_{i}} \Delta U_{i} + U \frac{\partial \gamma}{\partial U_{i}} \Delta U_{i} \right]$$

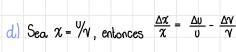
Moternos que U y
$$V$$
 Se puede reescribir de la Signiente Jorma: $U = \frac{x}{V}$, $V = \frac{x}{U}$. Por lo tanto

escribir de la Sigui
$$\Delta X = \frac{X}{\Delta} \Delta I$$

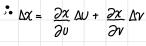
$$\Delta x = \gamma \Delta u + u \Delta \gamma$$

$$\Delta x = \frac{\chi}{v} \Delta u + \frac{\chi}{v} \Delta v$$

 $\frac{\Delta x}{x} = \left(\frac{v}{v}\right)\left(\frac{1}{v}\right)\Delta v - \frac{v}{v^2}\left(\frac{v}{v}\right)\Delta v$

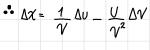




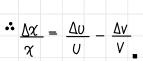
























Cuando expandimos el binomio obtenemos:
$$\frac{1}{2} \int_{-\infty}^{\infty} \left(\frac{1}{2} \right)^{\frac{1}{2}} \left(\frac{1}{2} \right)^{\frac{$$

$$\stackrel{\bullet}{\longrightarrow} \underset{N \to \infty}{\text{lim}} \left[\frac{1}{N} \sum_{i=1}^{N} \left(\frac{\partial x}{\partial u} \Delta u \right)^{2} + \left(2 \frac{\partial x}{\partial u} \Delta u \frac{\partial x}{\partial v} \Delta v \right) + \left(\frac{\partial x}{\partial v} \Delta v \right)^{2} \right]$$

$$\frac{\partial \chi}{\partial U} \int_{N \to \infty}^{2} \frac{1}{\sin \frac{1}{N}} \frac{1}{N} \Delta U^{z} + \left(\frac{\partial \chi}{\partial V}\right)^{2} \lim_{N \to \infty} \left[\frac{N}{\sin \frac{1}{N}} \frac{1}{N} \Delta V^{z}\right] + \frac{2}{N} \frac{\partial \chi}{\partial U} \frac{\partial \chi}{\partial V} \lim_{N \to \infty} \left[\frac{N}{\sin \frac{1}{N}} \frac{1}{N} \Delta V \Delta U\right]$$

$$\frac{\partial \chi}{\partial U} \int_{N \to \infty}^{N} \frac{1}{\sin \frac{1}{N}} \frac{1}{N} \Delta V \Delta U$$

$$\frac{\partial \chi}{\partial U} \int_{N \to \infty}^{N} \frac{1}{N} \frac{1}{N} \Delta V \Delta U$$

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$$\sigma_{\chi}^{2} = \left(\frac{\partial \chi}{\partial U}\right)^{2} \sigma_{v}^{2} + \left(\frac{\partial \chi}{\partial V}\right)^{2} \sigma_{v}^{2} + 2 \sigma_{vv}^{2} \left(\frac{\partial \chi}{\partial U}\right) \left(\frac{\partial \chi}{\partial V}\right)$$

 $\Delta u = (u - \overline{u})$

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$$t = 6.29 + 6.37 + 6.35 + 6.62 + 6.23 + 6.39 + 6.4 + 6.29$$

$$\overline{t} = 6.3675$$

$$\overline{\xi} = 6.3675$$

$$S_{\xi} = \sqrt{\frac{1}{8-1}} \left[(6.29 - 6.4)^{2} + (6.37 - 6.4)^{2} + ... + (6.29 - 6.4)^{2} \right]^{1}}$$

$$\Rightarrow S_t = 0.117$$

$$\vec{a} = 10.06 + 10.02 + 10.09 + 10.05 + 9.78 + 9.99 + 9.69 + 9.85$$

$$S_{4} = \sqrt{\frac{1}{8-1}} \left[(10.06 - 9.9)^{2} + (10.02 - 9.9)^{2} + ... + (9.85 - 9.9)^{2} \right]$$

$$S_{4} = 0.118$$

$$\frac{\overline{d}}{\overline{t}} \qquad \frac{9.99}{6.36} = 1.56$$

$$\vec{\nabla} = \frac{\vec{d}}{\vec{t}}$$

$$\frac{9.99}{6.36} = 1.56$$

$$\vec{\nabla} = \sqrt{S_t^2 \left(\frac{\partial V}{\partial t}\right)^2 + S_d^2 \left(\frac{\partial V}{\partial d}\right) + 2S_{dt}^2 \left(\frac{\partial V}{\partial t}\right) \left(\frac{\partial V}{\partial d}\right)}$$

$$S_{v} = \sqrt{S_{t}^{2} \left(-\frac{1}{t^{2}}\right)^{2} + S_{d}^{2} \left(\frac{1}{t}\right)^{2} + 2S_{dt}^{2} \left(\frac{1}{t}\right)\left(-\frac{1}{t^{2}}\right)^{2}}$$

$$S_{dt}^{2} = \frac{1}{8-1} \left[(6.29 - 6.4)(10.06 - 9.9) + ... + (6.29 - 6.4)(10.02 - 9.9) \right]$$

$$S_{at}^{2} = \frac{1}{7}(-0.0321) = -0.00458$$

$$\sqrt{(0.117)^2 \left(-\frac{1}{(0.4)^2}\right)^2 + (0.148)^2 \left(\frac{1}{(0.4)^2}\right)^2 + 2(-0.00458) \left(-\frac{1}{(0.4)^2}\right) \left(\frac{1}{(0.4)^2}\right)^2}$$

$$V = 1.56 \pm 0.02$$

- $S_{\nu} = 0.0233$

