Syntax and Intimacy as Structure.

Mittelfelds des Satzes: defined by *..heute wegen des schones Wetter:* as by Thailand with Imperative Forms und Hauptsatz verbindende Konnektoren (*und, oder, aber, denn, sondern) mit* Nebensatz *und* Dass-Satz als Raum. Raum *wie: ich hoffe das wir uns bald wiedersehen.* Infinitive *mit -zu, ich hoffe zu gewinen (gagner).*

Hauptsatz: Intercourse as function defining Satzglieder als parties de phrases ordonnées. *Texte werden durch diese variation abwechslungsreich, und lesen sich flussich.* Mittelfeld des Satzes als Raum: defining Mittelfeld *als alle Satzteile auBer dem Verb sind in Hauptsatz on ihrer Position Variable.*

Negation: *als Satz und Satzteil, mit Artikeln Pronomen und Adverbien.*

Imperativ: mit !: als Funktion: *Alternativen: Durch den Zusatz des Wortes: bitte, oder die Werwendung des Konjunktives (Es ware schon..) wird aus einem Befehl eine freundliche oder holiche Aufforderung. Im erster Linie kommt es aber auf die Betonnung an Hauptsatzvervindende Konektoren: Aufzahlung als Kern, Alternative, Kontrast, Grund, Kontrast differnz nach Negation.*

Nebensatz: *(weil ich mude bin): ergenz einem Haptsatz.*

Dass-Satz: *Ich hoffe, dass wir uns bald widersehen: verberganzung.*

Relativsatz: *Der Mann, der niemand lachte. Zusatzinformation Verbindung um zwei Satzen Amsterdam.*

Aufzahlung: *und sowohl, als auch, nicht nur, sondern auch-weder,.. noch.. Bedeutungs gleich mit und es vermiedet die Widerholung von*: Germanity.

Temporalsatz: *Mehrere Handlungen-Zustande Gleichzeitig. Nicht Gleichzeitig: Mehrere Handlungen-Sachverhalte nacheinander. Natural nicht Gleich metrik:* West Berlin Amsterdam.

Kausalsatz: $x_i \rightarrow y_i$. Range in West Berlin Amsterdam.

Konditionalsatz: define *Bedingung*: Condition West Berlin.

Finalsatz: define *Absicht* Intention und *Ziel* But als West Berlin.

Konsekutivsatz: define *Folge*: $k \rightarrow \infty$. Amsterdam.

Konzesivsatz: define *Wiederspruch* Contradiction, *Gegensatz* Contraste West Berlin und Amsterdam.

Adversativsatz: define *Gegensatz* Contraste. Amsterdam.

Modalsatz: *Art und Weise* (façon) *Vergleich* (comparaison): Amsterdam West Berlin.

Men Harm Reduction: Space ressources in German: Why Learn German as Code Stability: *Satz Struktur Iteration mit Konektor 1* in Amsterdam und 2 Ins West Berlin.

Filiaire as Inner Product and Ends Meet: Sample Space and Domain on: Marie Antoinette: $\sum x_i y_i \rightarrow 0,$ Sissi: $\sum(x_i - y_i) \rightarrow 0$ (Metric Distance). Business Men (Trump) as $\sum(x_i - y_i) \rightarrow 0$. Mafia in NY as Antoinette for Italian Families: Real Estate and Nobility: $\sum x_i y_i \rightarrow 0$, Metric Distance: $(y_i - h_\vartheta(x_i))$ as Mafia Regulating Other. Job and *Poste.*

Agency from Ottawa.

The Syndicate and Insurance defined as: $x_i \rightarrow y_i$ Insurance at *i* in $y_i \rightarrow x_i$.

The Shear $\begin{bmatrix} x_n \\ x_{n+1} \end{bmatrix} \to \begin{bmatrix} y_n \\ y_{n+1} \end{bmatrix}$ or $\begin{bmatrix} x_n \\ x_{n+1} \\ x_{n+2} \end{bmatrix} \to \begin{bmatrix} y_n \\ y_{n+1} \\ y_{n+2} \end{bmatrix}$ is known from:
Feedback Return definition is: $\exists f_i$ tangent to E, a bordered convex set as a closed Loop or closed Sequence, this closing E, and determining it. Open Loop is defined as an Open Set and the same for Closed.

Determinism is defined: **The Hahn Banach and Separation at Medterrannean Sea** theorem introduce a Work function at π_i at $i = k$. For these, $\exists$Þ a Sphere as given around an Origin, and $P \notin$Þ, then $\exists \pi_k$ hyperplanes, with $P < \pi_k <$Þ.

Dialectics and **Duality** are regularly introduced as:

$$\min_{Þ}(P - Þ) = \max_{K \text{ to } Þ}(P_k - \pi_K(P)), \quad \forall \pi : P < \pi_K < Þ$$

It is seen as: from Shears we meet a Two Track Research Approach, and are the Work part of the Product.

Proposal and Work Situation as **Projection Role**: W is spanned by orthonormal $\{w_1, w_2, .. w_n\}$ with Situation defined as The Known Projection $T(v) = v' = \langle v_1, w_1 \rangle w_1 + \langle v, w_2 \rangle w_2 + \ldots + \langle v, w_n \rangle w_n$. Yet they have to be ordered. The degenerate functional at Work is $T(v) = \langle v, v_0 \rangle$ for given $v_0 \in \mathbb{R}^n$ (**representing functional**). The fundamental Law of Calculus presents $D[a;b]$ with $T(v)$ as a Derivative and relates to Norm for Work as this representation.

We know $\begin{bmatrix} x \\ y \end{bmatrix}$ $\in$Convex Set, and $\exists \begin{bmatrix} a & b \\ c & d \end{bmatrix} = A$ such that $Av = v'$ called **Plane or Spacial Tranformation**.

Symetricity and the Syndicate $(-x, y) \leftrightarrow (x, y)$ as $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -x \\ y \end{bmatrix}$ is a Reflection on Syndicates. We also have a **Rotation as (Colonial) Displacement** relating to $\begin{bmatrix} \cos\vartheta & -\sin\vartheta \\ \sin\vartheta & \cos\vartheta \end{bmatrix}$. There is also a **Reflection on the** x **axis** (regulation of y): $(x, y) \leftrightarrow (x, -y)$ as $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x \\ -y \end{bmatrix}$. **A meaningless syndicate is a Reflection on line** $y = x$, as $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$. The use of **Agents with Syndicates** is by the property; $T : \begin{bmatrix} 1 \\ 0 \end{bmatrix} \& \begin{bmatrix} 0 \\ 1 \end{bmatrix} \to \begin{bmatrix} k & 0 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x' \\ y' \end{bmatrix}$ and $\begin{bmatrix} 1 & 0 \\ 0 & k \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x' \\ y' \end{bmatrix}$. The **Shears are defined as Millenials Hiring**:

$\begin{bmatrix} 1 & k \\ 0 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x' \\ y' \end{bmatrix}$ and $\begin{bmatrix} 1 & 0 \\ k & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x' \\ y' \end{bmatrix}$. The **right Probability Estimate** is by: $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x+ky \\ y \end{bmatrix}$ or $\begin{bmatrix} x-ky \\ y \end{bmatrix}$. **Shrears with Millenials** is as: $T : \begin{bmatrix} x'' \\ y'' \end{bmatrix} = \begin{bmatrix} 1 & k \\ 0 & 1 \end{bmatrix}\begin{bmatrix} \cos\vartheta & -\sin\vartheta \\ \sin\vartheta & \cos\vartheta \end{bmatrix}\begin{bmatrix} x' \\ y' \end{bmatrix}$. **The Pharmacy Oracle is by the Symmetry** of these Transformations T_i (Symmetries, Rotations and Reflections and Shears...) known as $A = E_1^{-1}E_2^{-1}E_3^{-1} = \begin{bmatrix} 1 & 0 \\ 3 & 1 \end{bmatrix}\begin{bmatrix} 1 & 0 \\ 0 & -2 \end{bmatrix}\begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ $= T_i^{-1}$, and $E_1 = \begin{bmatrix} 1 & 0 \\ -3 & 1 \end{bmatrix}$, $E_2 = \begin{bmatrix} 1 & 0 \\ 0 & \frac{-1}{2} \end{bmatrix}$ and $E_3 = \begin{bmatrix} 1 & -2 \\ 0 & 1 \end{bmatrix}$.It is seen as: from **Shears we meet a Two Track Research Approach**, **and are the Work part of the Product**.

Ordering is defined: the Buble Sort Algorithm, with the **Influence as Job Specification** where $A : (a_{ij})$ is a Role **Data Shift** $E_1 \otimes E_2$ and is:

Projection$[E_2] \subset$ Projection$[E_1]$ with $x \leq A^{-1}b$ an **Orangeraie**

Othering is defined: **Venue is by Augmented Reality**: $x_{\cdot i}$ in $AX = B$ is a solution to $\min CX - d$ subject to $AX + B, X \geq 0$. We call $x_{\cdot i}$ a feature of Venue. **Work is the dual of the Augmented Reality**: $\max B^T U - d$ subject to $A^T U \leq C^T$, where $u_{\cdot i}$ is a feature of Work.

Repère is defined as Inflection Points among Critical Points.

Borderland is defined as: Fuzzy Logic with k nearest neighbor Algorithm.

Excessive firing on $x_i \to y_i$ is by a Scientific Border x_i to Over Determination y_i.

Network Border is defined as: The **stable** part of E provided by an inner product with: $a, b \in A \subset E$, with $a * b \in A \subset E$.

The **stable** part of set E with action $*$ of Ω on E, $(\alpha, x) \in \Omega \otimes A$, $\alpha * x \in A \subset E$. The **stable** part of f of $E \to E$: $P \subset E$, such that $f(P)$ of P by $f \subset P$. **Stationary** point : of an arc parametrized (I, f) of $\mathbb{R}^3$ of class C^k with $k \geq 2$ (not an ordinary point), $M \in arc$ such that $\frac{\partial \vec{M}}{\partial t} = \overrightarrow{f'(t)} = 0$. Here in this Border, Immigration by Walk is addressed.

Borderscape: imaginative frontier when using the Software.

Rebordering is defined as: **Commands in Optimal Time are close to Google Drive**.

$[x^i(t)]$ are Phase coordinates. $[u^i(t)]$ command coordinates. See $[x^i(t)] \in X$ the Phase Space, and the admissible Command $[u^i(t)]$ may lead to $[u^i] \in \mathbb{R}^r$, with the closed domain of Command Space $U \subset \mathbb{R}^r$.

The **energetic parameters** $[u^i(t)]_{t\in[t_0,t_1]}^{i=1,..,r}$ are initial with $[x^i(t)]_{t=t_0}^{i=1,..,n}$ with $i \in [1;n]$. $\exists \varphi : [x^i(t)]^{i=1,..,n} \to \rho \in \mathbb{R}$ and the Command Parameters $[u^i(t)]_{t\in[t_0,t_1]}^{i=1,..,r}$ are linked as $\varphi([u^i(t)]^{i=1,..,r}) = 0$. (binded).

In U, we may set: $u_1(t) = \cos\phi$ and $u_2(t) = \sin\phi$, for arbitrary ϕ, then $(u_1)^2 + (u_2)^2 = 1$ is U complementary to G and U called circonference. (and G a closed domain as a Phase Domain). The movement of $[x^i(t)]$ is inside G, and on ∂G. The movement of $G \to \partial G$, is done by diffraction. The **Law of Diffraction** is:

$$[x^i(t)]^{i=1,\ldots,n} \to [x^i *]^{i=1}_{t\in[1,2,..,k]} \in \mathbb{R}^n$$

We say $[x^i(t)]^{i=1,..,n}$ is governing where the position conditions the movement. These positions are $[u^i(t)]^{i=1,..,r} \in U$, or $\mathbb{R}^r$. We know that if $[u^i(t)]^{i=j} \in \mathbb{R}^r$, it may be $|u^j(t)| \leq 1$, $\forall j = 1,2,3,..,r$.

Point of Restauration. (Virtual Reality and Sales for Retirement on the East Coast).
Dual Spaces and Adjunct Operators.
Generalities on Functionals: $\exists V$, and $\phi : V \to \mathbb{R}$, $\forall a,b \in \mathbb{R}, u,v \in V$, $\phi(au+bv) = a\phi(u)+b\phi(v)$.
The Selective Linear Functional: $\pi_i : \mathbb{R}^n \to \mathbb{R}$, $\pi_i(a_i) = a_i$
The Vector Space on Polynomials over t: $J : V \to \mathbb{R}$, $J(p(t)) = \int_0^1 p(t)dt$ with $J(ap(t)+bp'(t)) = aJ(p(t)) + bJ(p'(t))$
We have Integration and Trace on Eigenvalues: $T : V \to \mathbb{R}$ $T(A) = a_{11}+a_{22}+\ldots+a_{nn}$, $(a_{ij}) = A$
About Spaces: If $\exists V, V'$, then $A : V \to V'$, $A = (a_{ij})$ is also a vector space $\|Hom(V,V')\| = nm$, $\|V\| = n$, $\|V'\| = m$.

Definitions: If $V = \mathbb{R}^n$, $\phi(a_1,..,a_n)$, $\phi : V \to V'$, $\phi : V \to V'$, $\phi(x_i) = (a_1,..,a_n)(x_i)$ a row and column. We call V^* **Dual** of V as $(a_1,..,a_n) \in V$ and $\phi \in V^*$. ϕ is called functional (and is a function $\phi(t)$).

Dual Basis: if $V = \mathbb{R}^n$, $\|V\| = n$, $\|V'\| = m$, $\|V^*\| = n$ as $V^* = V$ and there we have a **Dual Basis**.

If $\{v_i\} \;|_{i=1,..,n}$ spans V, and $\delta_{ij} = \left\{\begin{array}{c} 1 \text{ if } i=j \\ 0 \text{ if } i\neq j \end{array}\right\} = \phi_i(v_j)$ then $\{\phi_j\} \;|_{j=1,..,n}$ is a basis for V^*.

Example: if $\left\{\begin{bmatrix} 2 \\ 1 \end{bmatrix}, \begin{bmatrix} 3 \\ 1 \end{bmatrix}\right\}$ span $\mathbb{R}^2$, and expect functions $\{\phi_1,\phi_2\}$ span $\mathbb{R}^{2*}$ and we know that $\begin{bmatrix} a & b \\ c & d \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} \phi_1(x,y) \\ \phi_2(x,y) \end{bmatrix} = \{x,y\}$ with

$\delta_{11} = \phi_1(v_1) = \delta_{22} = \phi_{22}(v_2) = 1$, $\delta_{12} = \phi_1(v_2) = \delta_{21} = \phi_2(v_1) = 0$,

$\begin{bmatrix} a & b \\ c & d \end{bmatrix}\begin{bmatrix} 2 \\ 1 \end{bmatrix} = \left\{\begin{array}{c} 2a+b = \delta_{11} \\ 2c+d = \delta_{21} \end{array}\right\}$, $\phi_1\begin{bmatrix} 2 \\ 1 \end{bmatrix} = \begin{bmatrix} 2a+b = 1 \\ 2c+d = 0 \end{bmatrix}$ where $a = -1, b = 3$. $\begin{bmatrix} a & b \\ c & d \end{bmatrix}\begin{bmatrix} 3 \\ 1 \end{bmatrix} = \left\{\begin{array}{c} 3a+b = \delta_{12} \\ 3c+d = \delta_{22} \end{array}\right\}$,

$\phi_2\begin{bmatrix} 3 \\ 1 \end{bmatrix} = \begin{bmatrix} 2c+d = 0 \\ 3c+d = 1 \end{bmatrix}$ where $c = 1, d = -2$.

$$\phi_1\begin{bmatrix} x \\ . \\ y \end{bmatrix} = -x+3y,\quad \phi_2\begin{bmatrix} x \\ . \\ y \end{bmatrix} = x-2y,\ \text{and } \{\phi_i\} \text{ span } \mathbb{R}^{2*}.$$

$$A = \begin{bmatrix} 2 & 3 \\ 1 & 1 \end{bmatrix} \leftrightarrow A^{-1} = \begin{bmatrix} -1 & 3 \\ 1 & -2 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} \text{or differently } Ax \leftrightarrow \phi = A^{-1}x$$

A Résumé for Adjunct: If $\{v_i\}$ span V, $\{\phi_i\}$ span V^*, $u \in V$, $u = \phi_1(u)v_1 + \phi_2(u)v_2 + .. + \phi_n(u)v_n$.

$\sigma \in V^*$, $\sigma = \sigma(v_1)\phi_1 + \sigma(v_2)\phi_2 + \ldots + \sigma(v_n)\phi_n$, $\sigma(v_i) \in \mathbb{R}$, ϕ_i is a function.

The Inner Product on $\mathbb{R}^n$: $\langle u,v\rangle = u^T v$.

The definition of the Adjunct Operator: $T : V \to V$, $\exists T^*$ adjunct as $\langle Tu,v\rangle = \langle u,T^*v\rangle$, $u,v \in V$.

Integration and Trace on Eigenvalues: T is square and n dimensional, then $\langle Tu,v\rangle = \langle u,T^Tv\rangle$, and $T^T = T$.

If $V = \mathbb{R}^n$, $\phi = (a_1,..,a_n)$, $\phi : V \to V'$, $\phi(x_i) = (a_1,..a_n)(x_i)$, we call V^* dual of V as $(a_1,a_2,..a_n) \in V$ and $\phi \in V^*$. ϕ is also called functional (and is a function $\phi(t)$).

If $\{v_i\}\ |_{i=1,..,n}$ spans V, and $\delta_{ij} = \left\{\begin{array}{l} 1 \text{ if } i = j \\ 0 \text{ if } i \neq j \end{array}\right\} = \phi_i(v_j)$ then $\{\phi_j\}\ |_{j=1,..,n}$ is a basis for V^*.

Inner product space V, if $u \in V$, $\exists \hat{u} : \mathbb{R}^n \to \mathbb{R}$, by $\hat{u}(v) = \langle v,u\rangle$. We call $\hat{u}$ a linear functional on V, $\hat{u} \in V^*$.

Example of inner product space V and $\hat{u}$ a linear functional on V.

$$\begin{bmatrix} 3 & 4 & -5 \\ 2 & -6 & 7 \\ 5 & -9 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = F\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{matrix} F_1. = \begin{bmatrix} 3 & 4 & -5 \end{bmatrix} \\ F_2. = \begin{bmatrix} 2 & -6 & 7 \end{bmatrix} \\ F_3. = \begin{bmatrix} 5 & -9 & 1 \end{bmatrix} \end{matrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} \hat{u}_1 \\ \hat{u}_2 \\ \hat{u}_3 \end{bmatrix}$$

$$F^T = \begin{bmatrix} 3 & 4 & 5 \\ 4 & -6 & 7 \\ -5 & +7 & 1 \end{bmatrix}\begin{bmatrix} \hat{u}_1 \\ \hat{u}_2 \\ \hat{u}_3 \end{bmatrix} = \begin{bmatrix} 3u_1 + 4u_2 + 5u_3 \\ 4u_1 - 6u_2 + 7u_3 \\ 7u_2 - 5u_1 + u_3 \end{bmatrix}$$

$\langle Ax,y\rangle = \langle x,A^Ty\rangle$

$\langle u,y\rangle = \langle A^{-1}u,A^Ty\rangle = \langle x,A^Ty\rangle$

Droit de representation:

c in $a < c < b$, is intermediary (procedural) by Rollé's theorem: f continuous on I, $f(a)$ and $f(b)$ contrary sign, then $\exists f(c) = 0$ on $a < c < b$. If $f : A \to B$,

$$X,Y \subset B \quad \text{then} \quad \exists f^{-1}(X \cup Y) = f^{-1}(X) \cup f^{-1}(Y)$$

and X increment to Y, then

$$\exists f^{-1}(X \cap Y) = f^{-1}(X) \cap f^{-1}(Y)$$

Recall that Injectivity ($f(a_1) = f(a_2) \to a_1 = a_2$)(one to one) and Surjectivity on all B, lead to **Bijectivity**.

Recall that there are definitions as least upper bound and great lower bound.

Finding Roots.

f continuous on I, bounded and closed, then $\exists_{x \in I} x,\ f(x) = M$, more precisely $m = f(x) = M$ atteigning its boundaries.

Piecewise continuous is seen as there are limits to the right or left.

We define: **Uniform Continuity** as if I closed and bounded, and $\forall \epsilon > 0, \exists \delta > 0$ such that $|f(x_1) - f(x_2)| < \epsilon \to |x_1 - x_2| < \delta,\ x_1, x_2 \in I$.

The Sequence: $\mathbb{N} \to \mathbb{R}$. The WeierstraB result is known as: $\exists M$ a bound to $\{s_n\} \uparrow$ increasing then convergent else not. If $\{s_n - s_{n+1}\} \to 0$ we call it Cauchy. If $\{s_n\} \to 0$ then $\sum_{n=1}^{\infty} \{s_n\}$ is a convergent series. (Money motivation and falsitude)(non negative terms and non alternating)

Utilities. Def: l^2 class of series as if $\{s_n\} \in l^2$ if $\sum_{n=1}^{\infty} s_n^2 < \infty$, where the Schwartz inequality $u \cdot v \leq \|u\| \|v\|$ and Minkovsky inequality $\|u + v\| \leq \|u\| + \|v\|$. Recall that the Triangle inequality is $\rho(x,y) \leq \rho(x,z) + \rho(z,y)$.

Def l^{∞} as $\exists \rho(x,y) = lub_{n \in \mathbb{N}} |x_n - y_n|$. In this regard there is an occurrence with the Baboushka, where it is: least upper bound and greater lower bound as root in restauration. The **Dissociation** is defined as: G_A of A is Open of $\langle A, \rho \rangle \Leftrightarrow \exists G_M$ of $\langle M, \rho \rangle$ such that $G_A = A \cap G_M$. Here G_M is a covering of M, and $\|f(x)\| \leq \|y\|_{\infty}$, and $f : x_i \to y_i$ is of $(l^1)^*$.

Def **Metric Space**: $\langle M, \rho \rangle : \exists \rho$, and

the Open Set is def: $\forall x \in B \subset M \to Ball(x, \epsilon) \subset B$ and the Closed Set as $\forall x_n \to L \Rightarrow \forall L \in B \subset M$.

Connectedness of Spaces (**mainly in Business**).

$\langle A, \rho \rangle \subset \langle M, \rho \rangle$, then $\neg \exists A_1, \neg \exists A_2$ such that $A = A_1 \cup A_2, \overline{A_1} \cap A_2 = 0, A_1 \cap \overline{A_2} = 0$, A is connected. If $A \subset \mathbb{R}$ connected$\Leftrightarrow a, b \in A, a < b,\ \exists c \in A$ such that $a < c < b$. If f is continuous on A connected,$f : A \to B$, then B is connected.

If f is *continuous* on $I = [a;b]$ then $\forall c,\ a < c < b$ and $f(c)$ exists $\forall c$.

$A_1 \& A_2$ are *connected*, and $\subset M,\ A_1 \cap A_2 \neq 0$ then $A_1 \cup A_2$ is connected.

We know A_k covers $A,\ A = \bigcup_{k=1}^{\infty} A_k$. If $diam A_k < \epsilon$ then A is *totally bounded* as $n < \infty$. Regularly bounded : $\forall x, y \in A, \rho(x,y) < L$. If $\exists y$ such that $\rho(x,y) < \epsilon, \forall x,$ then the set $x, y \in A$ is dense.

If $A \subset M$, A *totally bounded*, then $x_i \in A$ has a Cauchy subsequence.

If $x_i? \to ?x_{\infty}$, and is a Cauchy sequence then $x_{\infty} \in M$.

If M complete and $A \subset B$, A Open, then A Complete.

For Compactedness: M complete and *totally* bounded. If $x_i \in M$, has a convergent subsequence in M, then it is compact. (If A closed then compact).

For the Heine Borel Property: A a subsequence of coverings is finite (in M)$\Leftrightarrow$ M

compact.

$$f: \begin{vmatrix} A \\ M_1 \end{vmatrix} \to \begin{vmatrix} B \\ M_2 \end{vmatrix}, \quad \begin{vmatrix} A \\ M_1 \end{vmatrix} \text{ compact, } f \text{ continuous} \to B \text{ compact, with } f(A)$$

compact in B.

$f : A \to B$, continuous, A closed bounded, $A, B \subset \mathbb{R}$, then $\exists \beta$ with $f < \beta$ on A. (has a maximum)

f injective (1-1), continuous , $f : A \to B$, A compact, f^{-1} continuous, has f as homeomorphism.

The Rollé Procedure: f continuous on closed and bounded $[a;b]$, and $f(a) = f(b) = 0$, then $\exists c$, $a < c < b$ such that $f(c) = 0$.

The **Aquisition** is an Hypothesis and Residual Claim on Scene known as relating to Sonia Benezra and the Indigenous McGill Programme.. The **Cash Flow** is Ambient with Slack Values. From Mean μ, **Median** Elles and Mode m in the **Right Top Corner**,- it has Constraints and there is **Shift** in spite of Slack Values. **The Europeanism** when no Partition is defined and Sets are Open (no Point on Boundary) leads to defining a Graph that should *keep its vertices* that are Connected. The South African paradox is in Competition and Memory. In Colonialism: the function $f(P) \subset P$ in the Linear Programming tableau, has half many (upper triangular part)- as many Pivots and seen as constrained Dual in the Tableau. The corrective exercise to orthogonalize matrix A, meaning $A^{-1} = A^T$, and is known to relate to Slack Values as $A^T = A$, also called Symetric in $\langle x, A^T y\rangle = \langle Ax, y\rangle$. **Orthogonal** is defined: row vectors of A are orthonormal with column vectors of A. The Neo Impressionism is known as: *Die Revue Blanche und die Nabis* (München 1959).

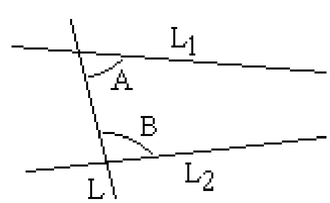
Conformity of the Corridor and the Associate.

We consider the same $f : C \to C$ and from complex analysis we have a conformal point z_0, on a threshold if the derivative $D^1(f(z_0)) \; |_{z_0}$ who conserves oriented angles (most of time mornings). In mid-day the associations comes from $f : \mathbb{R}^m \to \mathbb{R}^m$, in the canonical base $(1, i)$, $\exists \alpha, \beta$ such that $\exists \begin{bmatrix} \alpha & -\beta \\ \beta & \alpha \end{bmatrix}$ (syndicate) The $\begin{bmatrix} -\beta \\ \alpha \end{bmatrix}$ is French Speed.

Collation: the polar coordinates present ellipses where the sum is constant from the radiuses. It is clear that phone calls before the collation are troubling.

Ableitung (dérivation) and Abbildung (illustration) for 1st to 5th Euclid's Postulate for w and z.

1. L_1 from $t_0 = f_1$
2. *Mediatrice* →*Bissectrice*.
3. $d_c(f^* - c$(centre of polytope) $\geq$ Hyperplane and No Vertex.
4. No *Bissectrice* if this is a Right triangle.
5. Angles A and B determine L_2 as from *Bissectrice* and *Mediatrice*. (picture below)



If the sum of the interior angles A and B is less than 180°, the two straight lines, produced indefinitely, meet on that side.

In geometry, the parallel postulate, also called Euclid's fifth Postulate.

The Media Game.

$\exists(s_i, y_i)$, where s_i wait, $\exists x_1, x_2, .., x_k$ such that $f : x_1$ or $x_k \to y_i$ ($x_{k\pm l}$ is called **contingency**) with $f(g(x_i)) = f \circ g(x_i)$ with $g(x_1), g(x_2), \ldots, g(x_n)$ passing with a discrete representation. Here f is *abnormal in effect* and g *corrector*. The **Money Constraint** f is money leveraging in the aim to have more, and one should not have wrong relationship for it.

Divergence comes by lack of match, and administrative bounds. Divergence on the soil is defined as $\nabla \cdot F$, where F is $\mathbb{R}^n \to D$ (a function space). It is sustainable if $\exists \nabla \cdot \nabla F$. (the Laplacian) One has to reduce (r, ϑ). We consider susceptibility as one looks for a Lump Sum at Home. (If the $\exists \nabla \cdot \nabla F$ then we are likely). The step we are at is Auto Determination and Occurrence. Geopolitics and Geodesics.

We know **data** as $x_i \to y_i$. **Short term Cost is fixed** and Long Term is variable.

And also $n \in \mathbb{N}$ leading to x_1. we define Risk as being present to $y_i \to x_i$. Where we manage y_i to x_i, from $w_i \to y_i \to z_i \to x_i$. Clearly by the **Actuarial Perspective** we have the exercise of Finance to find y_i and z_i.

We see with **BroadbasedFunds**:

$$\frac{\partial(f^{-1})}{\partial x}(y) = \frac{1}{f'(x)} = \frac{\partial x}{\partial f(x)}$$ is a Chain Rule as **Lodging** with Displacement at x.

$f = \int f'(x)dx$ is known as Flip allowing Cash Flow. $f = A = E_1^{-1}E_2^{-1}E_3^{-1}$.

The **Extended Stay in Lodging with Amenities in Resort** (**Hysteresis and Team**) could define Luxury as necessity. The Projections on Activities (*metiers*) is the distance from Point P, to plane π at $\pi(P) \in \pi \cap K$ a Convex Set where $x, y \in K \to \lambda x + (1-\lambda)y \in K$ known as Estimation. As $\pi_i \to \pi(P)$ is a sequence, it also has for $i \geq k$ a Colonial Explanation.

The problem of the $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ is that there is a single eigenvector and is a loss, and therefore not accounted. The Store Front and Show Case are One. The requirement seems to be **Mahala** (City outskirts Market). The Market Counter is piecewise inversion of transcendent $\sin nx \leftrightarrow \cos nx$ in the $[0;1]$ strip. Known with $y = nx$. From Broadbased Funds we have this commercial benefit as a Work Situation Projection Role. The definition of Proposal and Work Situation as Projection Role lead to: W is spanned by orthonormal $\{w_1, w_{2,}..w_n\}$ with Situation defined as The Known Projection $T(v) = v' = \langle v_1, w_1\rangle w_1 + \langle v, w_2\rangle w_2 + \ldots + \langle v, w_n\rangle w_n$. Yet they have to be ordered. The degenerate functional at Work is $T(v) = \langle v, v_0\rangle$ for given $v_0 \in \mathbb{R}^n$ (**representing functional**). The fundamental Law of Calculus presents $D[a;b]$ with $T(v)$ as a Derivative and relates to Norm for Work as this representation.

Kleinste Quadrate und das N*a*herungspolynom. The approximation polynomial $Q_n(x) = a_0 + a_1x +, .., a_nx^n$ with

$$|f(x) - Q_n(x)|_2 = \sqrt{\int_a^b [f(x) - Q_n(x)]^2 dx} \rightarrow \min \phi(a_0, a_1, .., a_n) = \min J(\vartheta_i)$$

The analytical description for Montreal is

$$\min \phi(a_0, a_1, .., a_n) = \min J(\vartheta_i) = \int_a^b f^2(x)dx - 2\sum_{i=0}^{n} a_i \int_a^b x^i f(x)dx + \sum_{i=0}^{n}\sum_{j=0}^{n} a_i a_j \int_a^b x^{i+1} dx$$

a quadratic function in variables a_i. The minimum $J(\vartheta_i)$ of $\phi_n(a_0, a_1, .., a_n)$ is such that $\frac{\partial \phi(a_0,a_1,..,a_n)}{\partial a_k} \mid_{a=\widehat{a}} = 0$. We have:

$$0 = \frac{\partial \phi}{\partial a_k} \mid_{\widehat{a}} = 0 - 2\int_a^b x^k f(x)dx + \sum_{i=0}^{n} \widehat{a_i} \int_a^b x^{i+k} dx + \sum_{j=0}^{n} \widehat{a_i} \int_a^b x^{k+1} dx = 2\left[\sum_{i=0}^{n} a_i \int_a^b x^{i+k} dx - \int_a^b x^n f(\right.$$

$\forall k = 0, 1, 2, .., n$. This is a system $\sum_{j=1}^{n} h_{ij}\widehat{a}_j = c_i$. $\forall i = 10, 1, 2, .., n$.

$H_{n+1}(a; b) = (h_{ij}) = \left(\int_a^b x^{i+1} dx \right)$ and $c_i = \int_a^b x^i f(x)dx$. Here H_{n+1} is non singular. Tos how the matrix H_{n+1} is non singular, we look at $(c_k) = (c_0, c_1, .., c_n)$. It is possible to find polynomial $f(x)$ such that $\int_a^b x^k f(x)dx = c_k$, $\forall k = 0, 1, 2..., n$. This degree is almost n.

(namely if $f(x) = \sum_{i=0}^{n} a_i x^i$ and $2\left[\sum \widehat{a}_i \int_a^b x^{i+k} dx - \int_a^b x^k f(x)dx \right]$ has solution $\widehat{a}_i = a_i$, $\forall i = 0, 1, 2, .., n.$, therefore $\sum_{j=0}^{n} h_{ij} a_j = c_j$ with $i = 0, 1, 2, .., n$, is a system that has at least one solution. $H_{n+1}(0,1) = \begin{bmatrix} 1 & \frac{1}{2} & .. & \frac{1}{n+1} \\ \frac{1}{2} & .. & .. & .. \\ .. & .. & .. & .. \\ \frac{1}{n+1} & .. & .. & \frac{1}{2n+1} \end{bmatrix} = (h_{ij}) = \frac{1}{i+j-1}$. $\forall i,j = 1, 2, 3, .., n + 1$.

(The Hilbert Segment matrix)

For the Leats Squares Proof we have $Q_n(x) = \sum c_j P_j(x)$ with

$J_{(\vartheta_i = c_i = 0,1,2..,n)} = \int_a^b [f(x) - Q_n(x)]^2 dx \rightarrow$ min. (it is quadratic in c_k).

$$0 = \frac{\partial J}{\partial c_k} = 0 - 2\int_a^b P_k(x)f(x)dx + 2\sum_{j=0}^{n} c_j \int_a^b P_j(x)P_k(x)dx.$$

The Normal System $\sum_{j=0}^{n} c_j \int_a^b P_j(x)P_k(x)dx = \int_a^b P_k(x)f(x)dx, \forall k = 0,1,2,..,n$. The solution is to find $P_k(x)$. Here $\delta_{ij} = \int_a^b P_j(x)P_k(x)dx$. This coefficient matrix is diagonal (even better identity): $c_j = \int_a^b P_j(x)f(x)dx$. (orthonormality and Ottawa). We want a suite $P_k(x)$. One advantage for the expansion $Q_n(x) = \sum_{j=0}^{n} c_jP_j(x)$ is to improve it by adding an extra term (Gain at Dominion Square) $c_{n+1}P_{n+1}(x)$ by recomputing for $n+1$ and not n to 0. From $Q_n(x) = \sum_{j=0}^{n} c_jP_j(x)$ and $c_j = \int_a^b P_j(x)f(x)dx$ and from δ_{ij} and

$0 = \frac{\partial J}{\partial c_k} = 0 - 2\int_a^b P_k(x)f(x)dx + 2\sum_{j=0}^{n} c_j \int_a^b P_j(x)P_k(x)dx$, it follows that

$J_{(c_0,c_1,..,c_n)} = \int_a^b f^2(x)dx - \sum_{j=0}^{n}(c_j)^2 \geq 0$, with $\lim_{j\to\infty} c_j = 0$. This is the Bessel's Equation. So we saw: $\lim_{j\to\infty} J_j = \lim_{n\to\infty} \int_a^b [f(x) - Q_n(x)]^2 dx \to 0$ and we have the Parseval's Equality: $\int_a^b f^2(x)dx = \sum_{j=0}^{n}(c_j)^2$. The Proof is: Assume $\lim_{j\to\infty} J_j = \delta > 0$. Pick $\epsilon > 0, \epsilon^2 = \frac{\delta}{2(b-a)}$. By the WeierstraB theorem, there is a unique $P_m(x)$ with $|f(x) - P_m(x)| \leq \epsilon, a < x < b$.

$\int_a^b [f(x) - Q_n(x)]^2 dx \leq \epsilon^2(b-a) = \frac{\delta}{2}$. By Bessel's Inequality

$\frac{\delta}{2} \geq \int_a^b [f(x) - Q_n(x)]^2 dx \geq \delta \to \delta = 0$. QED.

This result comes from approximating on $Q_n(x)$, of $f(x)$. (also called mean convergence and not point convergence), $Q_n(x)$ may be a support. About pointwise convergence: if $P_j(x)$ is orthonormal and $Q_n(x)$ approxiamtes $f(x)$, the estimate $R_n(x) = f(x) - \sum_{j=0}^{n} c_jP_j(x)$, where $c_j = \int_a^b P_j(x)f(x)dx$ has

$$f(x) - \sum_{j=0}^{n} c_jP_j(x) = f(x) - \sum_{j=0}^{n} P_j(x)\int_a^b P_j(\xi)f(\xi)d\xi = f(x) - \int_a^b G_n(x,\xi)f(\xi)d\xi \quad \text{with} \quad G_n(x,\xi) = \sum_{j=0}^{n} P_j(x)P_j(\xi).$$

From the orthogonality property: $\int_a^b G_n(x,\xi)d\xi = 1$, $R_n(x) = \int_a^b G_n(x,\xi)[f(x) - f(\xi)]d\xi$. We want $R_n(x) \to 0$ if $n \to \infty$. This is the nature of the kernel G_n and f. If the sequence $Q_n(x) = \sum_{j=0}^{n} c_j P_j(x) \to_{mean} f$ and converges uniformly on $[a;b]$. We define $g(x) = \lim_{n\to\infty} Q_n(x)$, $g(x)$ being continuous and a uniform limit, (occupation), as $\int_a^b [f(x) - g(x)]^2 dx \to 0$. Here $g(x)$ has jumps.

The Rest: $R_n(x) = f(x) - P_n(x) = \frac{(x-x_0)^{n+1} f^{n+1}(\xi)}{(n+1)!}$ with $|x - x_0| \leq a$ and f has $n + 1$ derivatives. The problem with the alternating series: $P_n(x) = 1 - x + x^2 - \ldots (-1)^n x^n$ and presents the rest $R_n(x) = \frac{(-1)^{n+1} x^{n+1}}{1+x}$. **The existence for P_n for f (The WeierstraB theorem)**, $\exists m, M$ such that $m \leq \sum_{i=1}^{n} b_i x^i \leq M$ and $\sum_{i=1}^{n} (b_i)^2 = 1. \to \exists P_n \approx f$. ($f$ continuous)

As Pointwise $|f(x) - P_n(x)| < \epsilon$ then $\exists n \uparrow$ such that $P_n(x)$ good. If P_n and Q_n, are equal for x_i interpolating we have $P_n(x_i) = Q_n(x_i)$ and then $P_n = Q_n$.