What is an oo-category?	Bep-set
Def: 4 quasicategory 6 is a simplicial	l set such that for okien
we have born fillings:	• • • • • • • • • • • • • •
$\wedge^n_{i} \longrightarrow \mathcal{G}$	Fin(G,D) esset
	Funle, D) n= Homsset (X10, Y)
	D Kan => Fun(G,D) Kan
Where .	$\infty = 0 = cat = 2 + ca(C, D)$
Λ_{0}^{2}	Λ_2^2
	o <u>→ → 2</u>
Corresponds to 1-calegones through the tollow	
Thm: The nerve functor $N: Cat_1 \rightarrow sSet$ is full	ly faithful with essential
image given by those simplicial sets.	X where the horn fillings
are unique. Cot, E, Cod ~	morp = hmpt. classes of C1
One of the main differences between 1-cate	gonies and <i>w</i> -categories is
that we work with a hom-space instea	d of set the ob-cats with
Def GE Cotos, a, b c G. Then the Rom spo	discrete space of morphs
Homg (a,b)> Fo	$n(\Delta', G) =: A(C)$
· · · · · · · · · · · · · · · · · · ·	
(a,b)	‹Ç
When we say 'space' what we mean is	an "or groupoic!" / "anima"
which means that TE is a groupoid	every morphisms is an eq.
L's But just think space! _ from filling	g for all osish
Thus: ~ - groupoid iff Kan complex	v

Ex: DECat, ~, cD = D non-full subcategory spanned by isomorphisms
called the corr. D is obviously a groupoid. For GE Catoo we
define its core as the pullback
$\begin{array}{c} \mathcal{C} \longrightarrow \mathcal{C} \\ \mathcal{J} \stackrel{\bot}{\rightarrow} \mathcal{J} \\ \mathcal{N}(\iota(\pi \mathcal{C})) \longrightarrow \mathcal{N}(\pi \mathcal{C}) \end{array}$
Then <i>uG</i> is a space, and in fact the largest space contained in <i>G</i> .
Other than as venue of 1-categories our main source of
00-categories is through the so called coherent nerve:
Construction: Let G be "simplicially enriceded" category, i.e. Mape (a,b) esset.
The coherent nerve is the simplicial set given by
$(N_{\Delta}E)_{n} := Hom_{sCat_{1}}(C(\Delta), E)$
where C(S") is a "Hickening"
$C(\Delta^{e}) = 0$ $C(\Delta^{e}) = 0 \rightarrow 1$
$C(\Delta^2) = \sqrt[n]{n}$
The idea is that we this way encode the homotopies between maps.
Ex: • If Gescet st. Hz, y e & Mapg(X, y) is Kan
=> Noce Codo
• sset e scat:
Mapset (X,Y) = How sset (Dx X,Y) Esset
so in particular is Kan Esset, the full subcategory spanned by Kan complexes, simplicially enriched.

S:= Nation the op-category of spaces • qCatEsset ful subcategory of quasicategories	· · · ·													
• qCatEsSet full subcate gory of quasicategonies	· · · ·													
• qCatEsset full subcategory of quasicategories	•••													
\sim Cat _{es} := $N_{A}qCat$.														
We will throughout need to assume G is stable which means														
1) It admits a zero object: 0														
2) Every morphism g: X->Y admits a	• • •													
tibration cohibration	• • •													
$\operatorname{ker}(q) \longrightarrow X \qquad X \xrightarrow{\mathfrak{S}} Y$	• • •													
$\frac{1}{2} - \frac{1}{2} = \frac{1}$	• • •													
$0 \longrightarrow \gamma$ $0 \longrightarrow coker(g)$	• • •													
3) Pulback <=> Pushout	• • •													
Every morphism is the coternel of its kernel	• • •													
and the kernel of its cohernel	• • •													
· · · · · · · · · · · · · · · · · · ·	• • •													
	• • •													
	• • •													
· · · · · · · · · · · · · · · · · · ·	• • •													
· · · · · · · · · · · · · · · · · · ·	• • •													
· · · · · · · · · · · · · · · · · · ·	• • •													
	• • •													
	• • •													
	• • •													
· · · · · · · · · · · · · · · · · · ·	- • •													

Arrow categories	· · · · · · · · · · · · · · ·
Construction: Twisted arrow category is the	simplicial set
$T_{\omega}A_{r}(C)_{n} := Hom_{sSet}((\Delta^{n})^{\circ P} *$	Δ, σ,
Instead of thinking of Enjop*[n]=[Inn] Join:	
$(O_{\mathcal{L}} \subset I_{\mathcal{L}} \subset \cdots \subset N_{\mathcal{L}} \subset (n-1)_{\mathcal{L}} \subset \cdots \subset \mathcal{L} \subset \mathcal{L}$	P 1 9 [Cp+1+9]
with (-) e and (-), the 'left" or "right" of simpli	icial sets:
· · · · · · · · · · · · · · · · · · ·	$(*Y)_{M} = \coprod X_{M, X} Y_{MZ}$
\mathcal{E}_{X} : $TwAr(\Delta^n)$	[w]= (w'] [] [w5]
Objects: Arrows in D"	· · · · · · · · · · · · · ·
We organize these into an upwards	pointing triangle
with rows 0,1,_, n from the both	to the top:
· Row i = arrows that go up by	i, i.e.
$(0 \rightarrow i), (1 \rightarrow i+1), \dots, ($	(n-i->n)
• Row 0= All the identities	· · · · · · · · · · · · · ·
• Rown = the one map (0->	м.)
	· · · · · · · · · · · · · · · · · · ·
	The rest of the
	morphismis can then
	be taken as composites.
	of these
· · · · · · · · · · · · · · · · · · ·	
· · · · · · · · · · · · · · · · · · ·	
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · ·

Def	The a	rion category	$A_r(e) := Fun(\Delta', C) \in Cat_{\infty}$	• • • •
<u>٤x</u> :	Ar(Dn) Objects	n &: 0-1	• • • •
		morphism	s in Δ :	
• • • •	• • • •			• • • •
• • • •	• • • •	0 1 2 3	n-ι νι	• • • •
• • • •	• • • •	$\bullet \rightarrow \bullet \rightarrow \bullet \rightarrow \bullet$	$\bullet \rightarrow \bullet \circ$	• • • •
• • • •	• • • •			• • • •
• • • •	• • • •			• • • •
• • • •	• • • •	$\bullet \rightarrow \bullet$	$\bullet \rightarrow \bullet z$	• • • •
• • • •	• • • •	· · · · · · · · · ·		• • • •
	• • • •			
• • • •		• • • • • • • •	$\bullet \longrightarrow \bullet h - i$	
• • • •	• • • •	• • • • • • • •	$ \begin{array}{c} \cdot \\ \bullet \end{array} $	• • • •
• • • •	• • • •	• • • • • • • •		• • • •
The i	dea is.	that we will !	se Twarle) to define the	• • • •
Q-co	nstructi	on and Arle	the Sconstruction for a stable	2
• • • •				· · · ·
				1
	ategory (y. As through	out our entire reading course we	e usill
oo-ci start	with	y. As through Sconstruction	out our entire reading course we	e usill
oo-ci start	with	5 construction	out our entire reading course we	
00-ci start <u>Prop:</u>	uith TwArl	1. As through S - construction $E) \cong cAr(E)$	out our entire reading course we	Jiran 3
oo-ci start <u>Prop:</u>	with TwAr(As through S - construction $e) \cong cAr(e)$	sut our entire reading course us	
oo-ci start <u>Prop</u> :	with TwAr(As through S - construction $e) \cong cAr(e)$	sut our entire reading course us	
oo-ci start <u>Prop</u> :	uith TwAr(As through S - construction $e) \cong cAr(e)$	out our entire reading course us	
oo-ci start <u>Prop</u> :	uith TwAc(S construction $e) \cong cAr(e)$	out our entire reading course us	
oo-ci start <u>Prop:</u>	uith TwAr(S - construction $e) \cong cAr(e)$	out our entire reading course us	
oo-c	uith TwAr(S construction $(e) \cong (Ar(e))$	out our entire reading course us	
00-ci Start <u>Prop</u> :	uith TwAr(S construction (e) \cong construction	out our entire reading course us	
00-c	uith TwAr(S construction (e) \cong construction (e) \cong construction (e) \cong construction (e) \cong construction (f) \equiv construction (f	out our entire reading course us	
start <u>Prop</u> :	uith TwAr(S construction (e) \cong construction (e) \cong construction (e) \cong construction (e) \cong construction (f) \equiv construction (f	our entire reading course we	
start <u>Prop</u> :	uith TwAr(S construction (e) \leq LAr(e)	our entire reading course we	
oo-co start <u>Prop</u> :	uith TwAr(J. As through S construction (e) \leq LAr(e)	our entire reading course we	
Start <u>Prop</u> :	uith TwAr(S construction (e) \leq LAr(e)	our entire reading course we	
Start <u>Prop</u> :	uith TwAr(S construction (e) \leq LAr(e)	out our entire reading course we	

Ko of a stable co-category
We first see that for a ring R, we don't need a projective
module to define an object of Ko(R) - A perfect modure
is sufficient, i.e. MEMOd R which admits a finite projective
resolution $0 \rightarrow P_n \rightarrow P_{n-1} \rightarrow \dots \rightarrow P_0 \rightarrow M \rightarrow 0$
So for such M we can put
[M]:= $\sum_{i=0}^{n}$ (-1)' [P] $\in K_{o}(R)$ of choice of resolution
Def. Z(R) := No Ch(R) the as-category of chai
Decre (R) = D(R) full sub a-category spanned by the finite
comptexes of finite projective R-modules
Thus: Sending a perfect complex (Pn->Pn-1->>P_m) to it's
"Eveler characteristic" $\sum_{i=-m} (-1)^i [P_i]$ defines an isomorphism
The solt coust (The CDPert (R)) / ~ Ka(R)
The set of connected component Behere " ~ ext" is the equivalence relation generated by
To ~ set of connected componentialhere "~ ext" is the equivalence relation generated by B~ext A@C for all fibre sequences
To ~ set of connected componentiable re " \sim_{ext} " is the equivalence relation generated by $B \sim_{ext} A \oplus C$ for all fibre sequences $A \rightarrow B \rightarrow C$ in $D^{perf}(E)$.
To ~ set of connected component tablere "~ext" is the equivalence relation generated by B~ext A@C for all fibre sequences A -> B -> C in Dperf(2). Def: For a stade 00-category C:
To ~ set of connected componentiable re " \sim_{ext} " is the equivalence relation generated by $B \sim_{ext} A \oplus C$ for all fibre sequences $A \rightarrow B \rightarrow C$ in $OPerf(P)$. Def: For a stable co-category G: $K_0(C) := (TT_0 CC) / Northermore the sequence of th$
To ~ set of connected componentable re "~ext" is the equivalence relation generated by $B \sim_{ext} A \otimes c$ for all fibre sequences $A \rightarrow B \rightarrow c$ in $OPerf(P)$. Def: For a stable ∞ -category G: $K_0(c) := (TT_0 cG) / Next$ where again "~ext" is the equivalence generated by $D \sim_{ext} ciOc$
To ~ set of connected componentiable re "~ v_{ext} " is the equivalence relation generated by $B \sim_{ext} A \otimes C$ for all fibre sequences $A \rightarrow B \rightarrow C$ in $O^{perf}(P)$. Def: For a stable co-category G: $K_0(C) := (TT_0 CC) / v_{ext}$ where again "~ ext " is the equivalence generated by $b \sim_{ext} a \otimes C$ for all fibre sequences $a \rightarrow b \rightarrow c$ in C.
To ~ set of connected componentialhere "~ext" is the equivalence relation generated by B~ext A⊕C for all fibre sequences A→B→C in Operf(P). Def: For a stade ∞-category G: K_(C) := (TocC)/~ext where again "~ext" is the equivalence generated by b~ext a. for all fibre sequences a→b→c in G. So we don't frame to group - complete, instead we "split all
To ~ set of connected component to have " v_{ext} " is the equivalence relation generated by $B \sim_{ext} A \otimes C$ for all fibre sequences $A \rightarrow B \rightarrow C$ in $OPerf(P)$. Def: For a stade ∞ -category G : $K_0(C) := (TT_0 \cdot C) / v_{ext}$ where again " v_{ext} " is the equivalence generated by $b \sim_{ext} a \otimes C$ for all fibre sequences $a \rightarrow b \rightarrow c$ in C . So we don't have to group - complete, instead we "split all fibre sequences".
To ~ set of connected componentalhere " \sim_{ext} " is the equivalence relation generated by $B \sim_{ext} A \otimes C$ for all fibre sequences $A \rightarrow B \rightarrow C$ in $OPerf(P)$. Def: For a stable co-category G: $K_0(E) := (TT_0 \cdot C) / v_{ext}$ where again " \sim_{ext} " is the equivalence generated by $b \sim_{ext} c_{i} \otimes c$ for all fibre sequences $a \rightarrow b \rightarrow c$ in C. So we don't liave to group - complete, instead we "split all fibre sequences":
To serve connected componentiable re " \sim_{ext} " is the equivalence relation generated by $B \sim_{ext} A \otimes C$ for all fibre sequences $A \rightarrow B \rightarrow C$ in $OPerf(P)$. $Def:$ For a stable ∞ -category $G:$ $K_0(e) := (TT_0 \cdot C) / \sim_{ext}$ where again " \sim_{ext} " is the equivalence generated by $b \sim_{ext} c_{\infty} \circ C$ for all fibre sequences $a \rightarrow b \rightarrow c$ in C . So we don't liave to group - complete, instead we "split all fibre sequences".

The S construction
Construction: Let G be a stable a-category. For all Inje 12° we let
$S_n(c) \in Fun(Ar(Cu3), C)$
be the full sub-a-category of those functors F: Ar(Cn]) -> C
satistying
1) F(i < i) = 0 4 = 0, -, N
2) AU 'squares' in Ar(["]) go to a pushout/pullback square
in G
$\mathbf{O} = \mathbf{O} = $
$0 \rightarrow \bullet \dots \bullet \rightarrow \bullet 2$
$0 \cdots = 0 = 3$
$0 \xrightarrow{i} \phi \phi^{-i}$
\tilde{o}
It can be shown that
$S_n(e) \cong F_{un}(E_{n-1},G)$
which gives us it is stable again. Furthermore, we have that
Fun (Ar([M]), E) is functional in both (M] and E, and one can
check that the full subcortegories Sn(C) are preserved under the
face and degeneracy maps in 12°P.
S(C): Dep → Cat st Simplicial stable ao-categories
Steble 00-cetegone
∧ S: Cat St → SCat St _∞
· · · · · · · · · · · · · · · · · · ·

Unraveling the definition $S_0(e) \cong *$, $S_1(e) \cong C$, $S_2(e) \cong Ar(c)$
but we mainly think of a typical element of Sz(C) as a
diagram
$0 \rightarrow q \rightarrow b$
$\sigma \rightarrow a/b$
Cotton the analysis of the Part Has P
intref. Than an arrows a -10. We have the face maps.
$S_2(e) \cong Ar(e) \longrightarrow S_1(e) \cong C$
$a \rightarrow a \rightarrow b$ $\stackrel{d_{a}}{\longmapsto} a/b$
$\int \mathbf{F} \cdot \mathbf{F} \cdot \mathbf{A} $
$\int \frac{dz}{dz} dz$
· · · · · · · · · · · · · · · · · · ·
\mathcal{D}
. Det: . For a stable of caregoig. G we define the augebraic. A theory.
Space. Ke is reserved for
space ke := stable binne the acquation version
Space. EG := SILSICII Ke is reserved for the spectrum version Thm: There are canonical isomorphisms
Space $k_{C} := \Omega I S C I K C := \Omega K $
Space Space $k_{C} := \Omega I_{L} S(C) I$ K_{C} is reserved for the spectrum version Thus: There are canonical isomorphisms $K_{O}(C) \cong T_{O} k(C) \cong T_{I} (I(CI)).$ I = Can be shown that $k(C)$ admits the structure of a commutative
Det: For a stable as-catagoig & we derive the angulataic k-theory Space $\& G := SLISICI \\ Ke is reserved for the spectrum version Thus: There are canonical isomorphisms K_0(G) \cong T_0 \& (C) \cong T_1 (I \cdot CI).It can be shown that \& (C) admits the structure of a commutativegroupoid structure over \$ functur X: N(Fin_1) \cong -\$ s.t. Xo G t: D^{\circ P} = \$is a Cartesian group$
Det: For a stable as-categoig is we define the angebraic k-theory. Space ket := space ket is reserved for the spectrum version Thus: There are canonical isomorphisms K ₀ (E) = To k(E) = The (1 (C1)). It can be shown that R(C) admits the structure of a commutative groupoid structure over S functor X: N(Fin,) = -S st × out: D ^{or} - S is a Cartesian group Lo ive it is an E ₀₀ -group since To k(C) = Ko(C) is an ordinary.
Det: for a should as-calleding to we define the anglotaic to theory space $k_{C} := \Omega I_{L} S(C) I$ the spectrum version Thus: There are canonical isomorphisms $K_{0}(C) \cong T_{0} k(C) \cong T_{1} (I(C)).$ It can be shown that $k(C)$ admits the structure of a commutative groupoid structure over S functor $X: N(Fin_{1})^{o} \rightarrow S$ st. $X \cdot C + M^{o} - S$ is a Cartesian group Lo i.e. it is an E_{∞} -group since $T_{0} k(C) \cong K_{0}(C)$ is an ordinary abelian group
Space Space KE is reserved for the spectrum version Thus: There are canonical isomorphisms K ₀ (E) = To k(C) & The (1 (C1)). It can be shown that R(C) admits the structure of a commutative groupoid structure over S functor X: N(Fin,) = -3 st. ×o (ut: 1) ^{of} - 3 is a Cartesian group Lo i.e. it is an E ₀₀ -group since To k(C) & Ko(C) & Ko(C) & Cordinary abelian group ~> UE obtain a functor
Space. Space. EG := S211SLCII KG is reserved for the spectrum version Thum: There are canonical isomorphisms Ko(G) = To R(C) + The (1 (C1)). It can be shown that R(C) admits the structure of a commutative groupoich structure over S functor X: N(Fin,) = 3 st. Xo (it: 2) = 3 is a Cartesian group Lo ine it is an Exo-group since To R(C) + Ko(C) is an ordinary abelian group Me obtain a functor Re: Cates - > CGrp(S)
Der: For a stable as-caregoing & we define the argentaic. Attracting Space RE:= S212S1C11 Re spectrom version There are canonical isomorphisms K ₀ (G) = Tro R(C) = The (1 (C1)). It can be shown that R(C) admits the structure of a commutative groupoid structure over 3 functor X: N(Fin_1) = 3 st × out 20° = 3 is a Cartesian group is in a Cartesian group when this an Exposure since To R(C) = Role) is an ordinary abelian group ME obtain a functor Re: Calson -> CGrp(S) To understand this better we need to compare it to an op-catego-
Space Space $kG := \Omega[ISIC]$ $KG := reserved for the spectrum version Thus: There are canonical isomorphisms K_0(G) \cong T_0 k(C) \cong T_1 (I(CI)).The can be shown that k(C) admits the structure of a commutativegroupoid structure over S functor X: N(Fin, 19^{-3} - 3)is a Cartesian groupL_2 i.e. it is an E_{\infty}-group since T_0 k(C) \cong K_0(C) is an ordinaryabelian groupM_0(G) \cong T_0 k(C) \cong K_0(C)k_0(C) \cong T_0 k(C) \cong K_0(C)L_2 i.e. it is an E_{\infty}-group since T_0 k(C) \cong K_0(C) is an ordinaryabelian groupM_0(G) \cong Catego \longrightarrow CGrp(S)To understand this better we need to compare it to an \infty-catego-rical version of the Q-construction.$

Q - Construction , Note: We don't need to assume stable
Construction: Let G be any as-category and let
$Q_n(e) \in Fun(TwAr(Eng)^{op}, G)$
be the full subcategory spanned by those functors which
takes every "square" in Twar([-]) to pullback squares
G
The Qn(e) assemble into a simplicial as-category
Q(e): 12 - cata Quillen Q-construction
To see this we first note that
$F_{UN}(T_{UV}A_{f}(-)^{U}, \mathcal{C}): \Delta^{UV} \longrightarrow C_{Cat}_{\infty}$
gives a functor, since
TwAr(-): sset -> sset
is the right adjoint to
(-)° ^p * (-): sSet -> sSet
One then has to prove that all the boundary and degeneracy maps
preserves the full subcategory Qn(C).
This books alot like a collection of "spans', which explains
the following
Thm: Let & be a stable co-category. The simplicial space
$\mathcal{L}Q(e): \Delta^{e_p} \longrightarrow \mathfrak{Z}$

it to a functor
Span (B) - Or category of spans in G
with fiber over [1] being Qn(e).
Fact: 10 Pel 2 Ispan El
Comparison theorem We have a functor
$Tw Ar([n]^{\circ p}) \longrightarrow Ar([n] * [n]^{\circ p})$
$(i \leq j) \longrightarrow (i_{\ell}, j_{\tau})$
Case N=2;
$TwAr(\mathbb{D})^{p}) \longrightarrow Ar(\mathbb{D}^{p})^{v} Ar(\mathbb{D})$
$(0_{\ell} \in 1_{\ell}) (0_{\ell} \in 2_{\ell}) (0_{\ell} \in 2_{\ell}) (0_{\ell} \in 1_{\ell}) (0_{\ell} \in 1$
$(0_{0} \leq 0_{0})(0 \leq 0) \bigcirc \rightarrow \bullet \rightarrow$
$(o \leq 1) \qquad (1 \leq 2) \qquad $
$(2 \leq 2 \ell)$ $(2 = 2)$ $(2 = 2)$ $(2 = 2)$ $(2 = 2)$
$(2_{r} \leq 2_{r}) (3 \leq 3) 0 \rightarrow \bullet \rightarrow \bullet 3 (3 \leq 5) (2_{r} \leq 0_{r}) \downarrow \downarrow \downarrow \downarrow$
$(1_r \in 1_r) (1_r \in 0_r)$
(0, 40,) 0 5 (354)
We have a functor
$\mathbb{D}^{op} \longrightarrow \mathbb{D}^{op}$ $\dots (-)^{esd} : s^{g} \longrightarrow s^{g}$ subdivision
There is a $T_{\nu} \Delta \sigma (T_{\nu} T)^{\rho} \rightarrow \Delta \sigma (T_{\rho} T + \Gamma_{\rho})^{\rho}$ with the lab
The map while the second of th
fun(t, c), to a map $controuvariant$ $S(e)^{esd} \xrightarrow{\sim} Q(c)$
So we get ILSGIZILSC end IZILQUEN ZISpan(e)
we get that k(C) ~ RISpan(C)1

Results
We have a functor
$\mathcal{C} \cong Hom_{\mathrm{Spen}(e)}(0,0) \longrightarrow Hom_{\mathrm{Spen}(e)}(0,0) \cong \mathcal{Q} \operatorname{Spen}(e) \mathbb{Q} \oplus \mathbb{Q}$
Using $k(e)$ is an E_{o} -group this map factors over an E_{o} -group map $(\iota c)^{o_{o}-o_{f}} \rightarrow k(c)$
Which through the inclusion Proj(R) = LOD ^{Perf} (R) in particular gives a
map
k(R) = Proj (R) → (1 Dperf(R)) → k(Dperf (R))
which turns out to be an equivalence
- Hobls in Righer generality:
Thm: If G is a stable co-category with an "exhausted weight
structure, then 2 full subcate ganies
$c(\mathcal{C}^{\otimes})^{\otimes} \mathcal{J}^{p} \cong k(\mathcal{C})$
Résolution theorem?
Universal Additive invariant
Blumberg - Gepner - Tabuada additive & factors over (S)
Thm: k: Cats -> S is the initial group like functor which admits
a natural transformation ((-)=>k=Cat st -> chion(3)
More precisely:
The inclusion Additive: F(0)= final object
Fundre (Cat st , CGrp (3)) = Funded (Cat st , 3) I
admits a reft adjoint
$(-)^{g(p)} = (-)^{g(p)} = (-)$
and Region (-) Note: c is additive but not group-live

•	-	A <u>d</u>	di	hi	fic	Y	<u> </u>	he	201		M.	_	Ţ	- (Ça	ta	۲ [.] –	-)	S		zre	por	بال	r.e	.=	-)	Ŧ(A			ج	FC	E)	λŦ	FC	2)	•
٠	۰	٠	۰	Ċ	·		•	•	b		Å) ¥	k		•) •	x k	żĹ	Ċ		•	•	•	•	•	•	•	٠	•	•	•	٠	•	۰	•	•
•	•	•	•	•	•	•	•	•			•			•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	٠	٠	٠	٠	٠	•	•	•	٠	٠	•	•	٠	٠	•	•	•	٠	•	•	٠	•	•	•	•	٠	•	•	•	٠	٠	٠	٠	•	•	•	•
٠	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	٠	٠	•	٠	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	٠	٠	٠	٠	•	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•
•	٠	٠	•	•	٠	•	•	•	٠	٠	•	•	٠	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	0	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	٠	۰	•	•	٠	•	•	٠	٠	٠	•	•	•	•	٠	•	٠	•	•	•	٠	•	٠	•	•	٠	٠	•	٠	٠	٠	•	•	•	•	•	•
•	•	٠	٠	٠	•	•	•	•	•	•	٠	•	•	•	•	٠	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•
٠	٠	٠	٠	٠	٠	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	٠	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	0	٥	•	٠	٠	•	٠	•	٠	•	•	•	•	0	٠	•	•	٠	•	۰	•	•	•	•	٠	۰	•	•	•	•	٠	•	0	•	•
٠	٠	٠	۰	٠	٠	•	•	•	٠	٠	•	•	٠	٠	٠	٠	•	•	•	•	٠	•	٠	٠	•	٠	•	•	•	٠	٠	٠	٠	•	•	•	•
•	٠	٠	•	•	٠	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	٠	٠	۰	۰	•	•	•	•	۰	٠	٠	•	•	•	٠	۰	٠	•	•	•	٠	•	•	•	•	•	•	۰	•	•	•	•	۰	•	•	•	•
٠	٠	۰	•	•	٠	٠	•	٠	٠	٠	•	٠	٠	٠	٠	•	•	٠	•	•	٠	•	٠	٠	•	٠	٠	٠	٠	٠	٠	٠	•	٠	•	•	•
٠	•	٠	٠	٠	•	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•
٠	٠	۰	٠	٠	٠	•	•	٠	٠	٠	•	•	•	•	٠	٠	٠	•	•	•	٠	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
٠	•	٠	۰	۰	•	•	٠	٠	٠	٠	٠	•	•	•	٠	٠	٠	•	•	٠	•	۰	•	•	•	•	٠	٠	٠	•	•	•	٠	٠	•	•	٠
•	٠	٠	٠	٠	٠	•	•	•	٠	٠	•	•	•	٠	•	•	•	•	•	•	٠	•	•	•	•	•	•	٠	•	٠	•	•	٠	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	٠	٠	•	٠	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	0	۰	•	٠	٠	•	٠	٠	٠	•	•	•	•	•	٠	•	•	٠	•	۰	•	•	•	•	٠	٠	•	•	•	•	٠	•	•	٠	•
٠	٠	٠	۰	۰	•	•	٠	٠	٠	٠	٠	•	•	٠	٠	۰	٠	•	•	٠	٠	۰	•	•	•	•	٠	٠	٠	•	•	•	٠	٠	•	•	٠
•	٠	٠	٠	٠	٠	•	•	٠	٠	٠	•	٠	٠	٠	٠	•	•	٠	•	•	٠	٠	•	٠	•	٠	٠	٠	٠	٠	٠	٠	٠	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
•	٠	٠	•	•	٠	•	•	•	٠	•	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	٠	٠	•	•	•	•	•	•
٠	٠	۰	٠	٠	٠	•	•	٠	٠	٠	•	•	•	٠	٠	٠	٠	٠	•	•	٠	٠	٠	•	•	٠	٠	٠	٠	٠	٠	٠	٠	•	•	•	•
•	•	٠	۰	٠	٠	•	•	٠	٠	•	٠	•	•	•	٠	•	٠	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•	٠	•	•	•	•
٠	•	٠	۰	۰	•	•	•	•	•	•	٠	•	•	•	•	٠	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•