--:! {field: []: (:smiley:} <- **Field Functions Library: Produce and Execute Field Plans** -> muse/docs/lib/field.md
--:neutral_face: field: *Fields are rectangular solids defined by a range (a `situation` pair with `fields` keyed properties).* -> field, _field
--:+ *Fields are made up of plots, each plot at least small enough to deal with turtle inventory limitations.*

--:# **Execution train runs from `field.make` to `field.plot` to `field.plan` to execute the plan**

--:: field.make(commands: fieldCommands, faced: ^:) -> *Load field files; return their `field.plot` calls* -> `report: ":" &:`

--:> fieldCommands: *For CLI* -> `:[fieldOpName: ":", ranger: ":", firstPlot: #:?, lastPlot: #:??]`
--:+ *The second entry, `ranger` in `fieldCommands` is a string which may simply be a name for a `range`, (a kind of `place`).*
--:+ *If so, the range name gets the range's features dictionary and the field file name to load (keyed as `features.fields`).*
--:+ *It could also be a string specifying the name of a farm and a farm field name in that farm (separated by a colon).*
--:+ *If so, the farm name specifies the farm's `range` and so the farm range's features dictionary.*
--:+ *The `fields` entry in that dictionary is itself a dictionary, keyed by the farm's field name to specify its range name.*
--:+ *With the proper range name in hand, either directly as above, or from the farm, the field file to load is specified.*

--:: field.plot(commands: field.plotSpan, fieldsOp: (:smiley:, fieldOpName: ":", plots: #:, offset: xyz?) -> *Plots* -> `report: ":" &: &!`
--:+ *Called by field files. Calls `fieldsOp` from field file (which calls `field.plan`).*

--:> field.plotSpan: *`{}` spans all plots; if only first, default plots after first* -> `:[_:, _:, first: #:?, last: #:??]`

--:: field.plan(planName: ":", fielding: fieldParameters, offset: xyz?) -> *Run plan, default offset {0,0,0}.* -> `report: ":" &: &!`
--:+ *Loads and executes the prototype plan (which calls `field.paths`) for each (odd, even, or last) level of a plot.*

--:> fieldParameters: *`bounds` (and materials to fill and replace)* -> `:[bounds, fieldParameters.fills?, fieldParameters.removeables??]`

--:> fieldParameters.fills: *Group or list of craft items for fill material* -> `group|craft[]`

--:> fieldParameters.removeables: *Material replaced by fill* -> `group|craft[]`

--:> craft: *Minecraft item `detail.name` without `minecraft:` prefix* -> `":"`

--:: field.extents(:bounds:, :strides:, faced: ":"?) -> *Plots placed* -> `field.count, field.count , eP, eP, striding, ^:, ^:`

--:+ Returns `nplots:[fieldOp #:}, slots:[fieldOp]: #:}, strides: eP, run: eP, striding, turn: ^:, back: ^:`
--:+ *Extents for `stride` (shorter) and `run` (longer) virtual axes for each `opName` in the `strides` entries unless `faced`.*

--:> field.count: _dictionary keyed by 'opName`for number of elements in field for that operation_ ->`[fieldOp]: #:`

--:> strides: *dictionary keyed by `opName` for the distance along the stride axis for a striding ->* `[fieldOp]: #:`

--:> striding: *dictionary keyed by `opName` of vectors incrementing game coordinate positions for `turn` ->* `[fieldOp]: xyz`

--:> eP: *pair of coordinates for extents ->* `:[xyz, xyz]`

--:> fieldOp: *Operation name in the set for a particular kind of field ->* ":"

--:# **Path generator: flying ox plow paths through given three dimensional rectangular bounds.**
--:+ *Ox plow paths minimize travel to plow a field. Flying oxen (aka turtles) do that in three dimensions.*

--:: field.paths(bounds: xyz[]) -> *Called by plan prototype file to generate plans for plot.* -> `paths, yDelta: #:, xzEdge: facing`

--:> paths: *_Flying ox traverse of three dimensional rectangular solid ->* `{start: ":"[], odd: ":"[], even: ":"[], last: ":"[]}`
--:+ *Returns paths, vertical traverse (`yDelta: #:`), and orientation of longest horizontal edge for bounded block.*

--:# **Cut, fill, till, and traverse points defining rectangular volumes** using `field.plan` to optimize traversal.

--:: field.cut(places: :[nearPlace: ":", farPlace: ":"]) -> *Quarry out blocks from one place to the other.* -> `":" &:`

--:- cut point point -> *Quarry out blocks bound by named points (defining a rectangular solid).*

--:: field.fill(parameters: :[nearPlace: ":", farPlace: ":", fill: ":", target: ":"?]) -> *Fill, Till, Replace.* -> `":" &:`

--:< *Filling and target may be one of the turtle categories or a Minecraft detail name without prefix* `minecraft:`

--:- fill point point filling ?target -> *Layer fill bounds by points; optionally swaps out only target blocks.*

--:: field.till(parameters: :[nearPlace: ":", farPlace: ":", seed: ":"]) -> *Till the seed from one place to the other.* -> `":" &:`

--:< *Seed may be one of the turtle categories or a Minecraft detail name without the prefix* `"minecraft:"`

--:- till point point seed -> *Till the seed bounds by named points (defining a rectangular solid).*

--:: field.fence(parameters: :[ranger: ":", fencing: ":"?]) -> *Put fencing using* `layer` *plan.* -> `":"`

--:- fence range [item] -> *Put item or available wooden fence from one point to another in range.*