

Planetary Simulation

This report will run a simulation that assigns system information for every planet in the `planets.xml` database so that we can examine how well the simulation produces socio-industrial codes, population, and the like.

First, we read in the XML file. In order to assign colonization variables, we need to know the:

- distance from Terra
- faction type: Inner Sphere, Major Periphery, Minor Periphery, Clan
- year colony founded

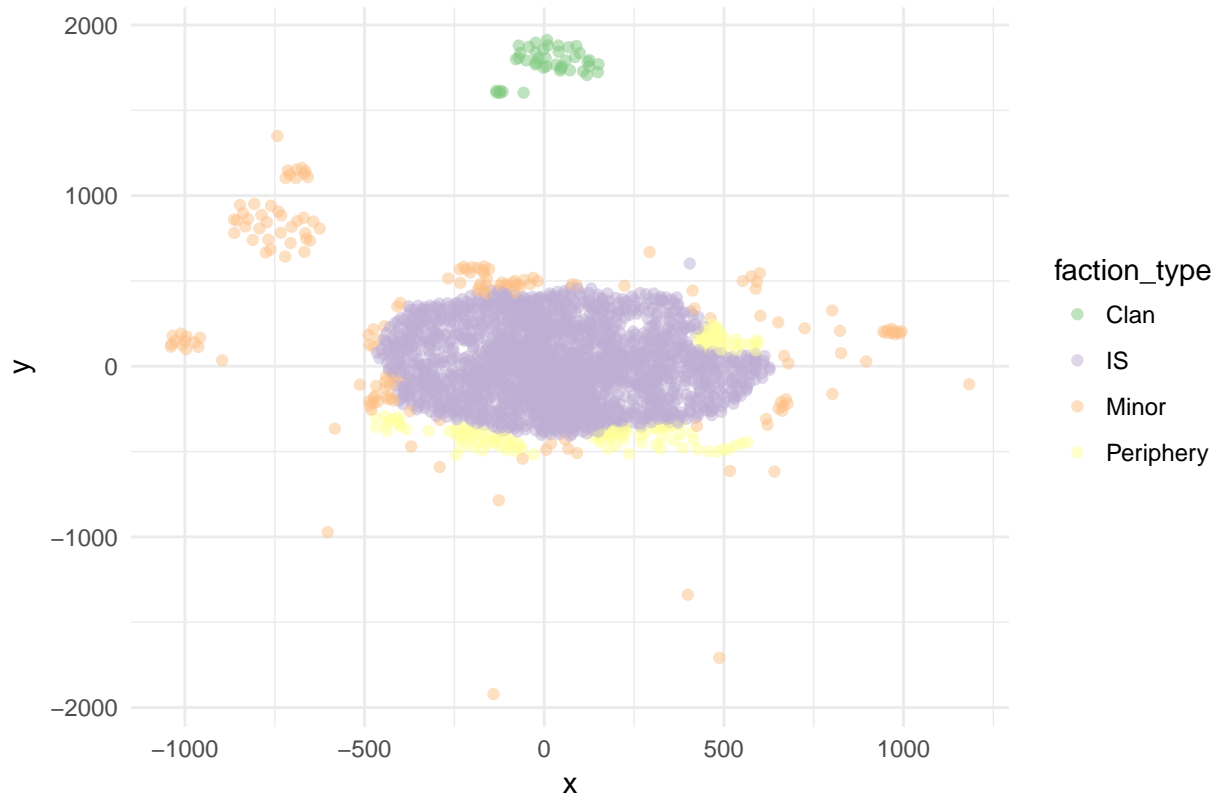
We pull data from year 3047, so that we can derive clan factions by original foundings. We determine original year of colony founding by the first faction change from the default faction of `UND`. We code faction type from specific faction codes. The method used here is not safe to be used if the date is changed from 3047 as we only code factions that existed in 3047, not all possible factions. We remove all factions that were `ABN` (abandoned), `UND`, and `NONE`. This removes all of the Exodus Road planets.

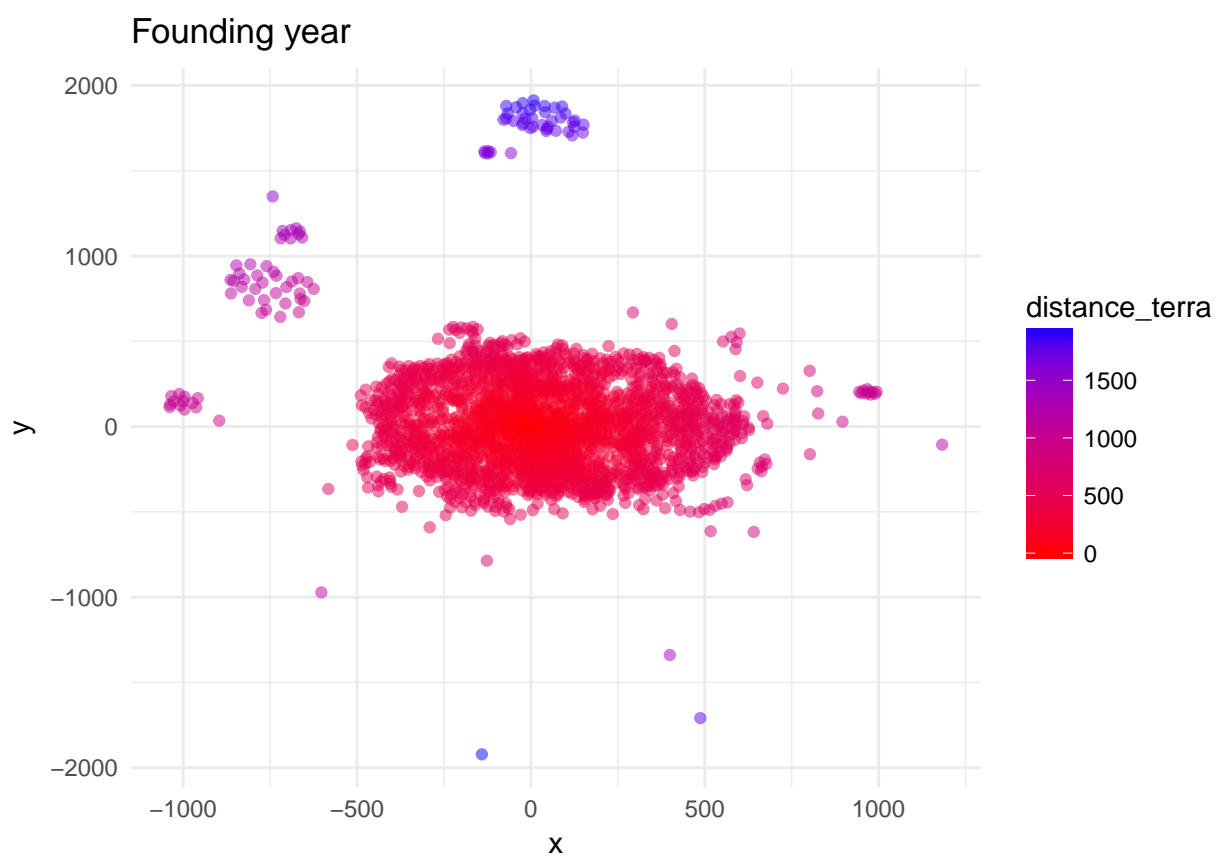
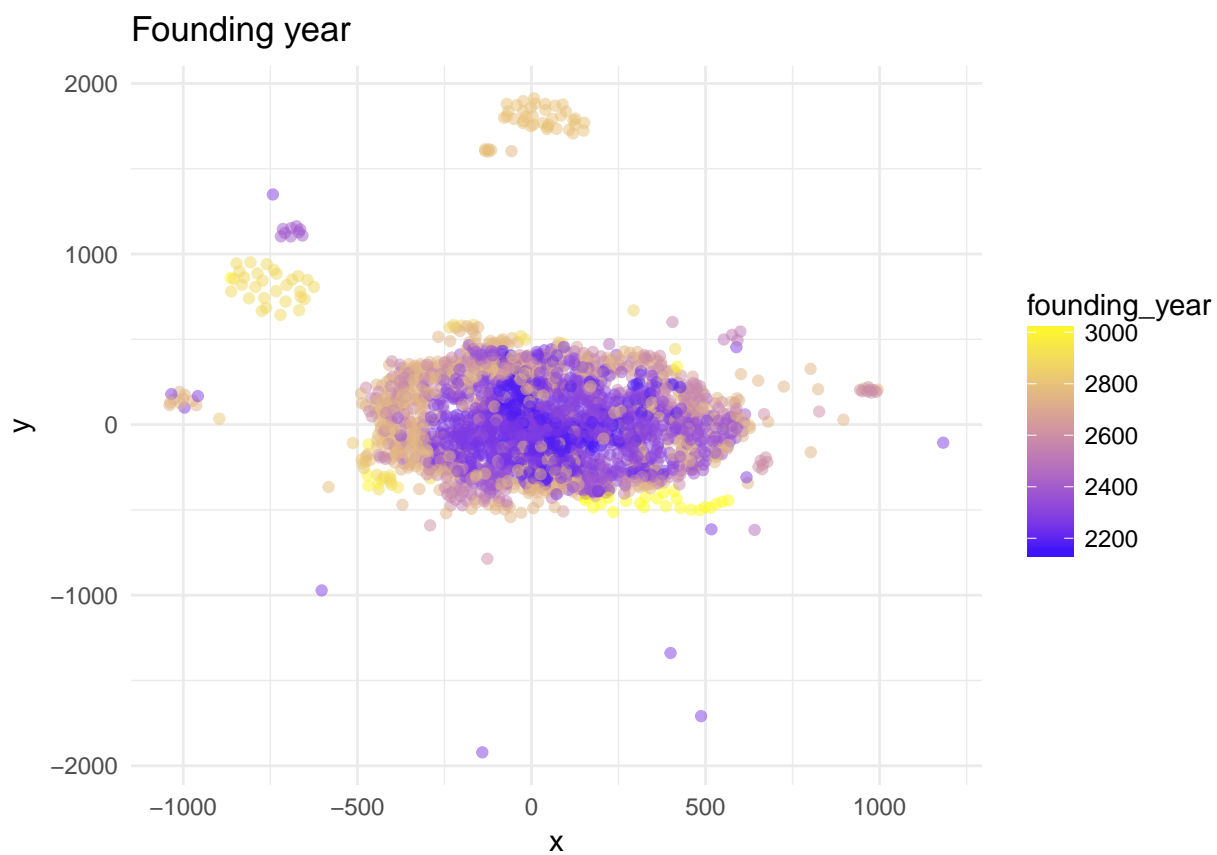
The following cases of planets were missing a founding year:

```
##      name      x      y faction hpg founding_year tech industry raw
## 2489 Pioche -392.36 -497.51  PIND <NA>          NA <NA>    <NA> <NA>
##      output agriculture distance_terra faction_type
## 2489    <NA>          <NA>        633.6107      Minor
```

After removing missing factions and missing founding year, we have a total of 2275 planets. The maps below show our key independent variable values across different planets.

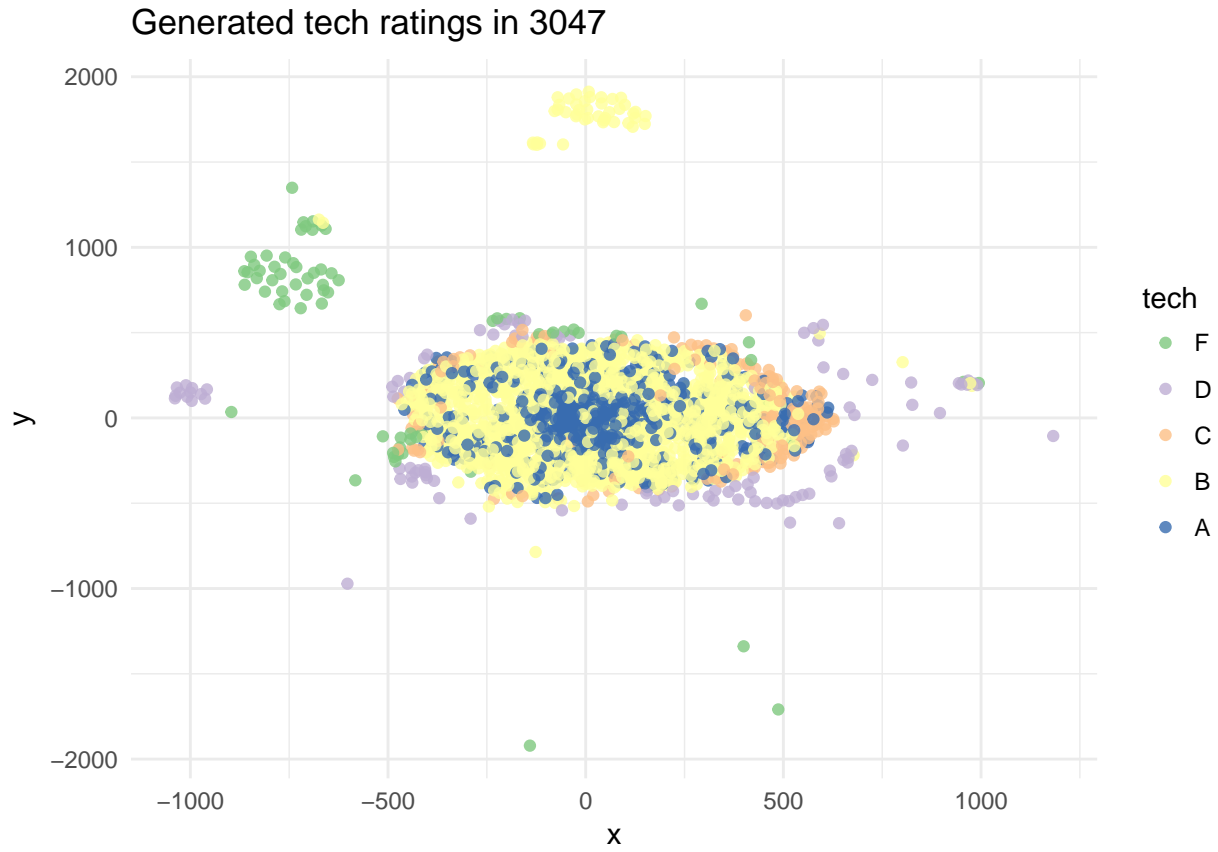
Faction types in 3047



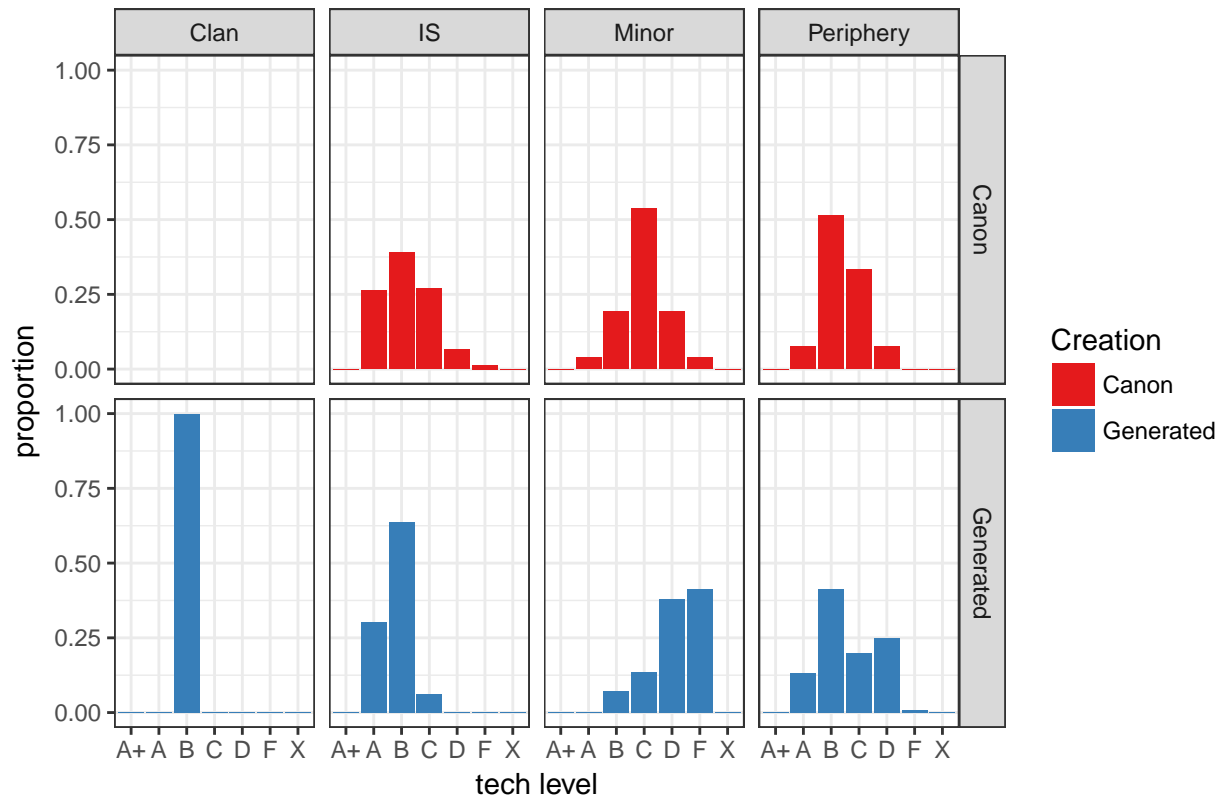


Now, we cycle through every single planet and generate a system complete with astronomical and social data.
Now lets look the results.

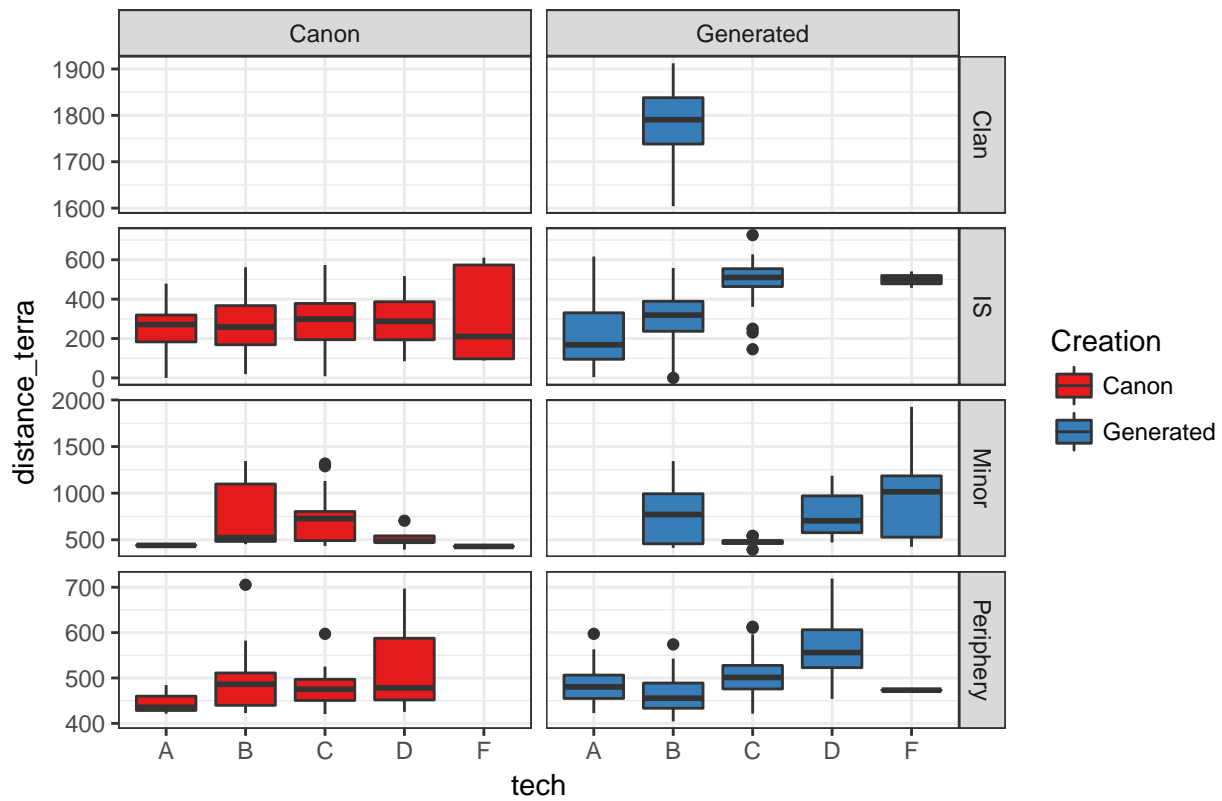
Tech Rating



Tech rating distribution by faction type

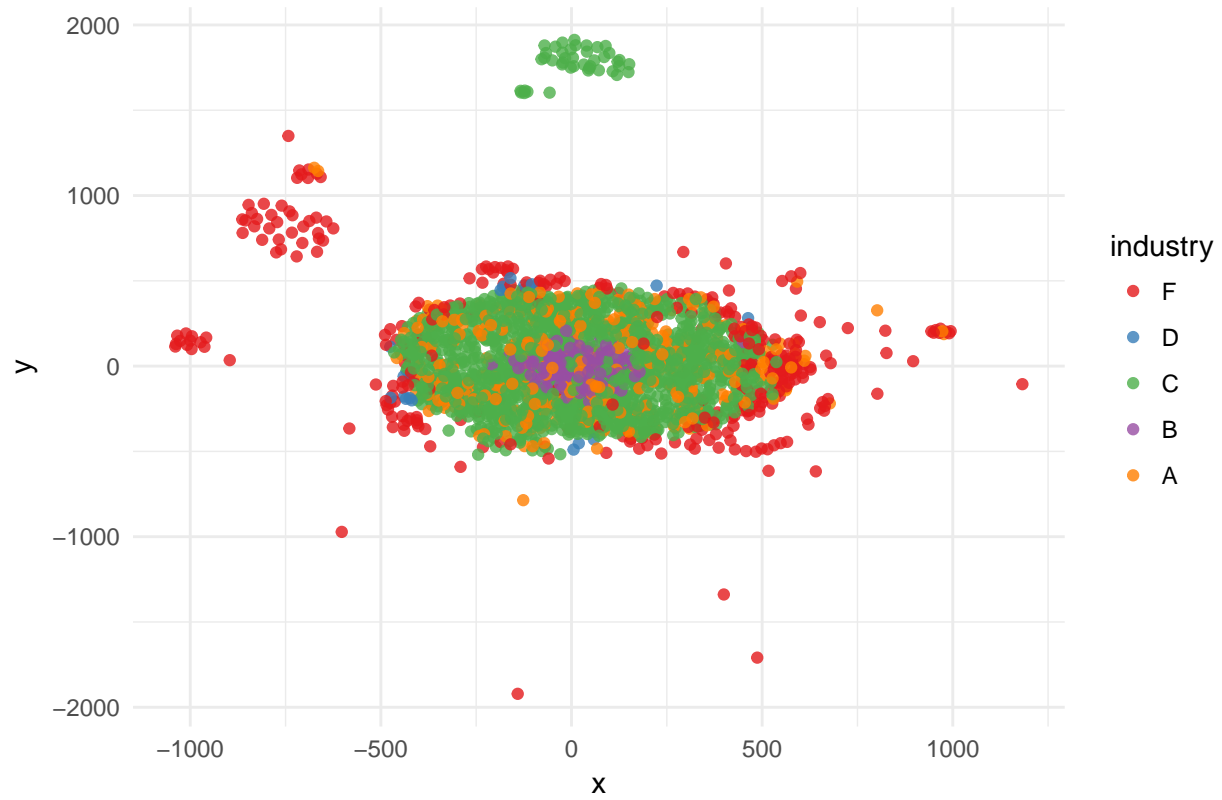


Relationship between tech rating and distance from terra, by faction type

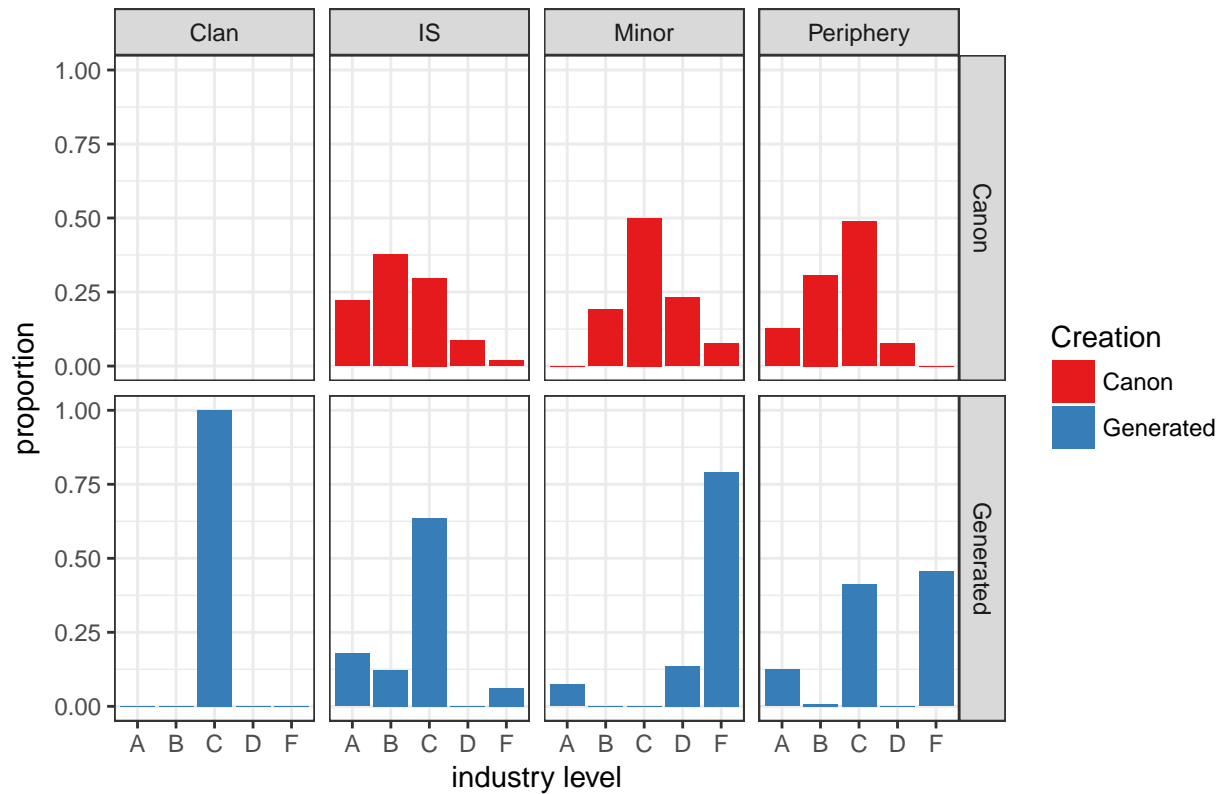


Industry Rating

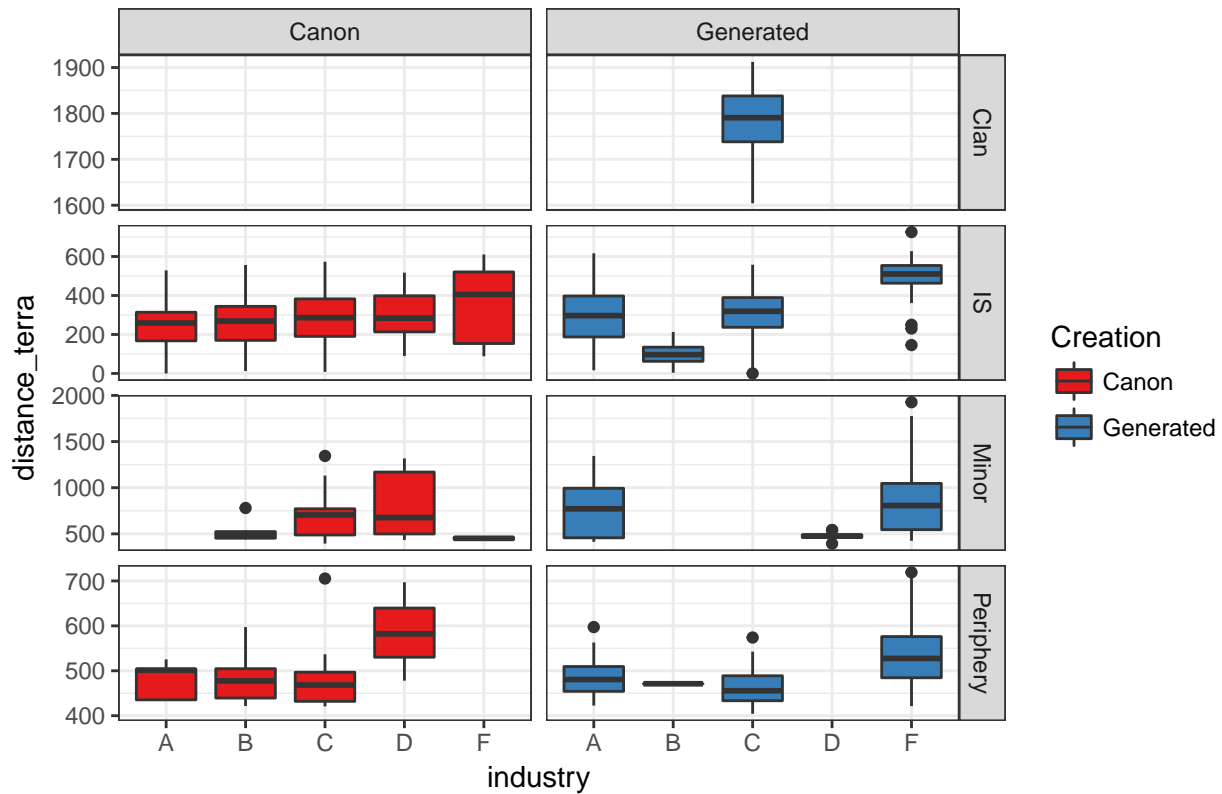
Generated industry ratings in 3047



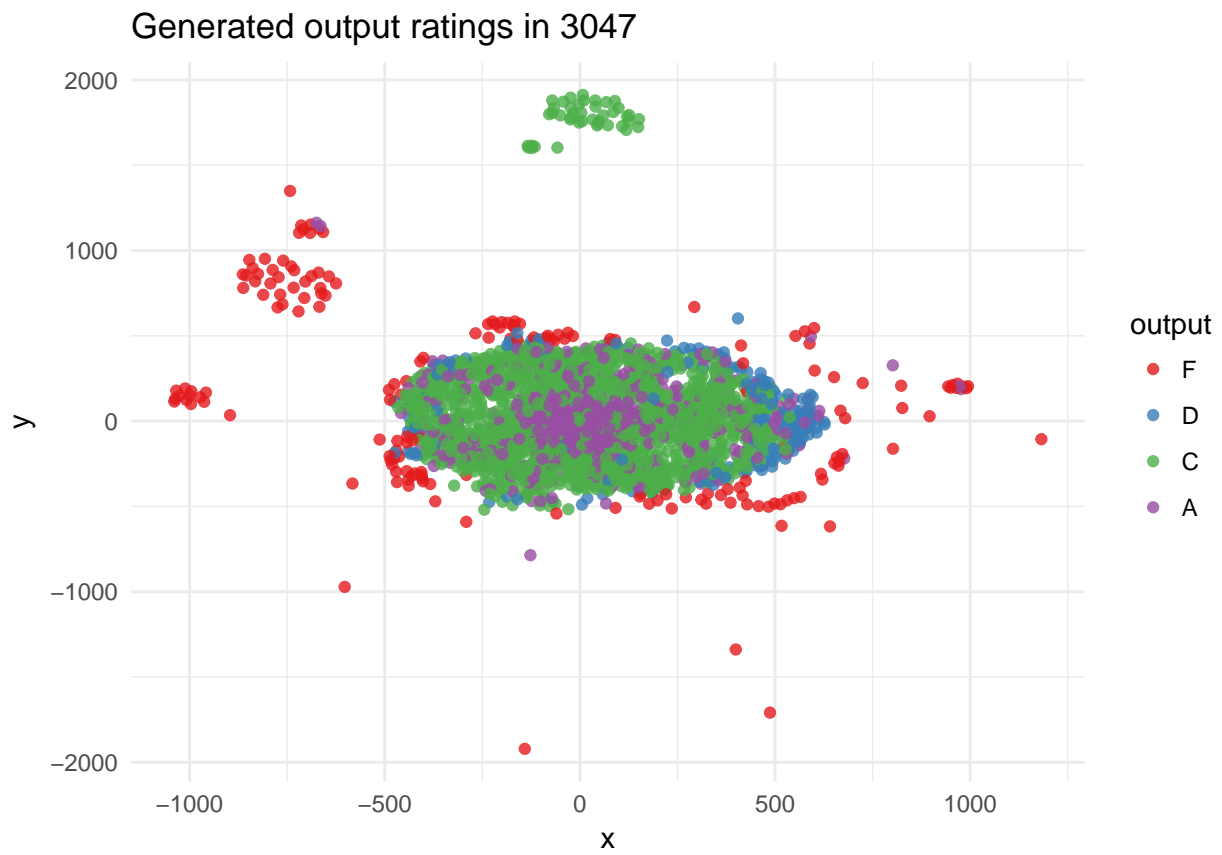
Industry rating distribution by faction type



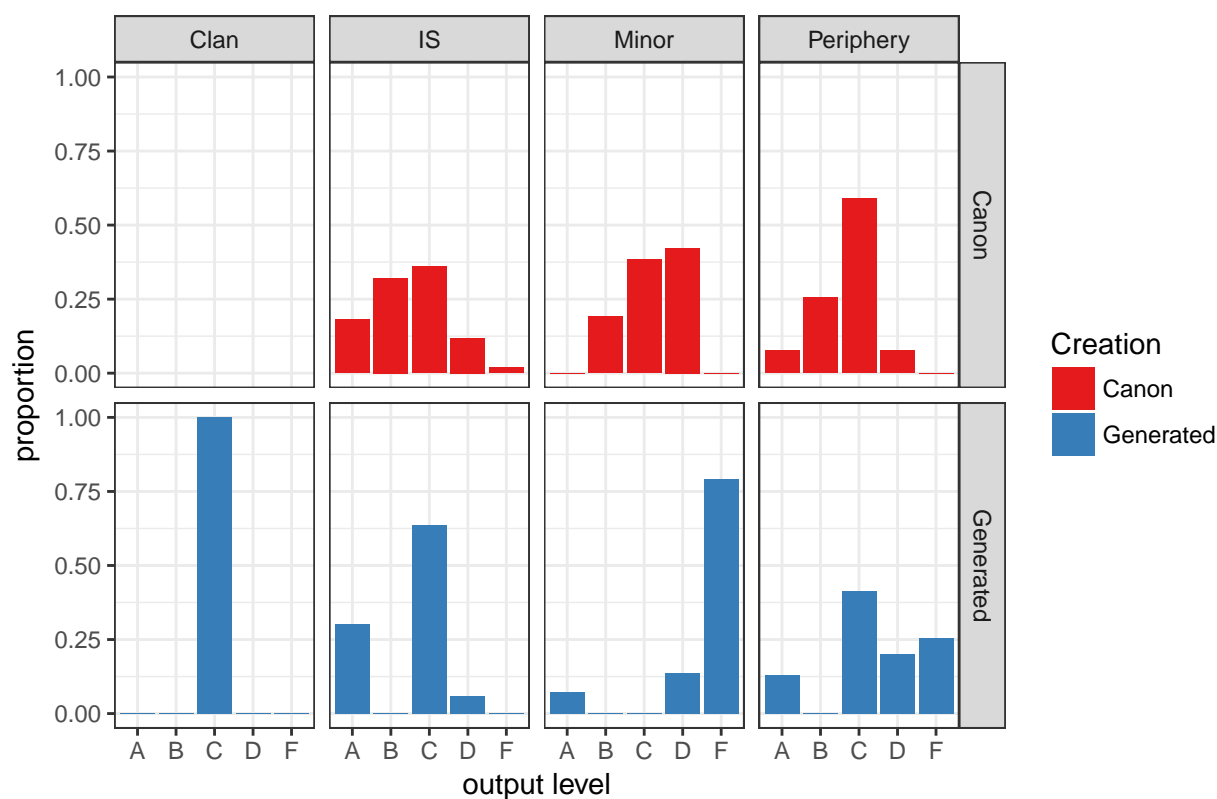
Relationship between industry rating and distance from terra, by faction ty



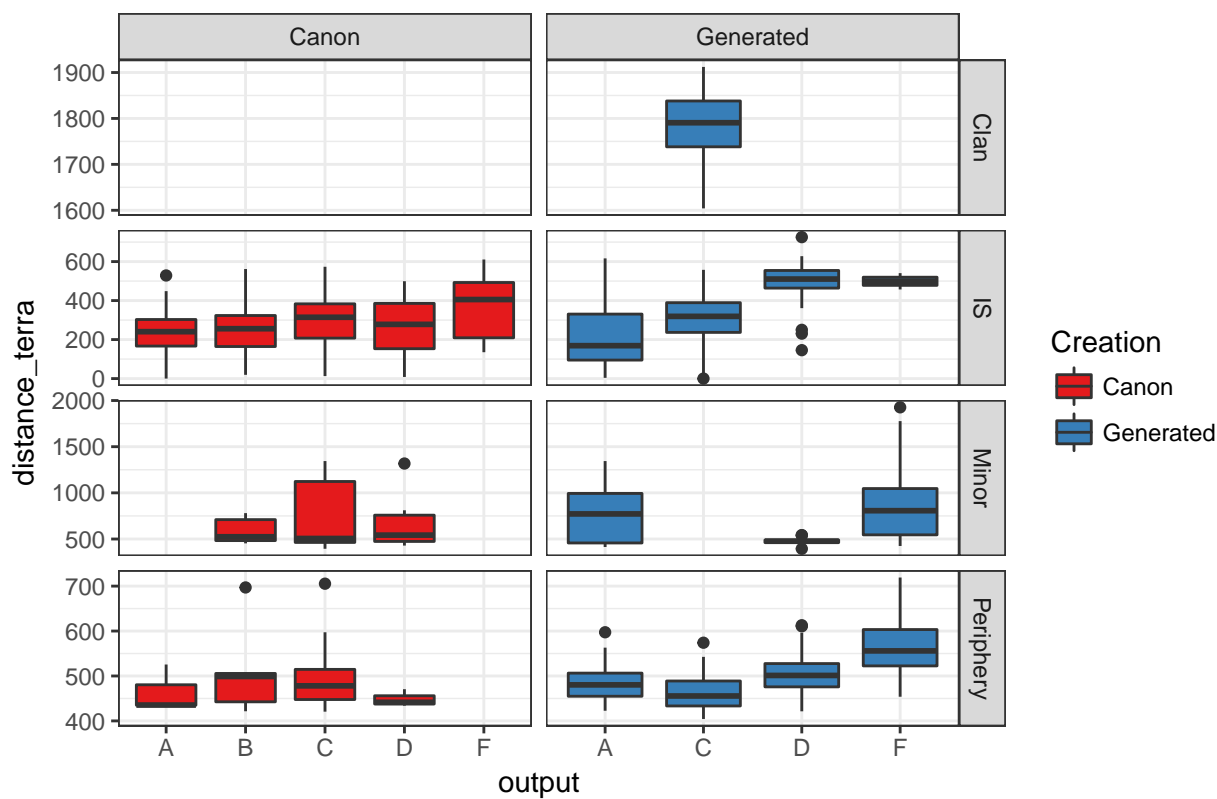
Output Rating



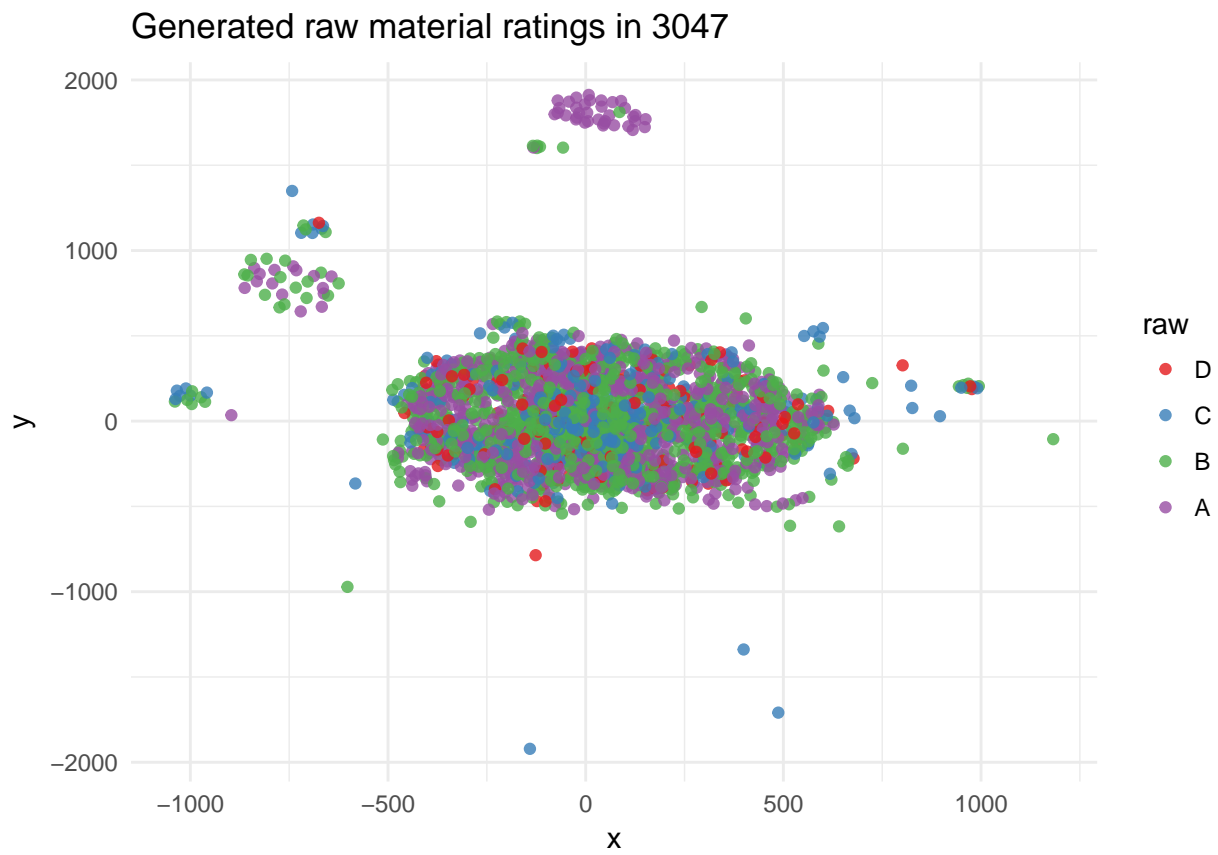
Output rating distribution by faction type



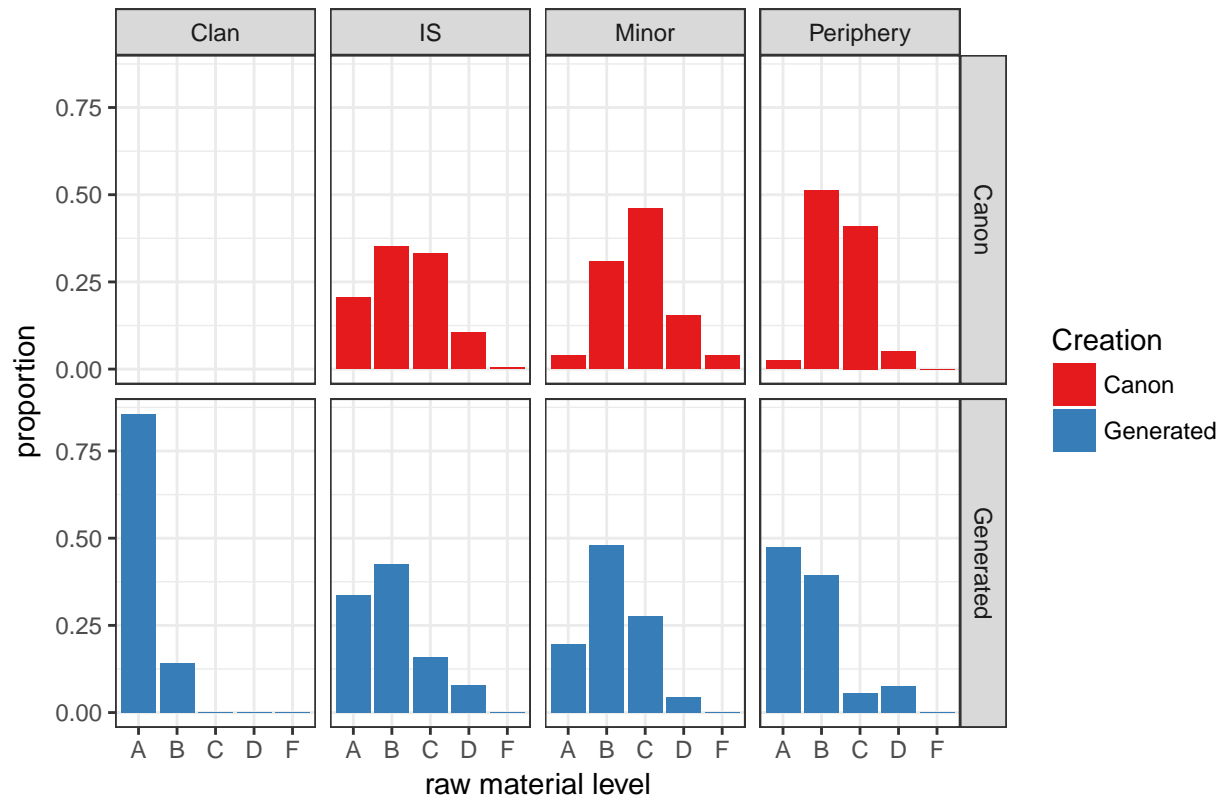
Relationship between output rating and distance from terra, by faction type



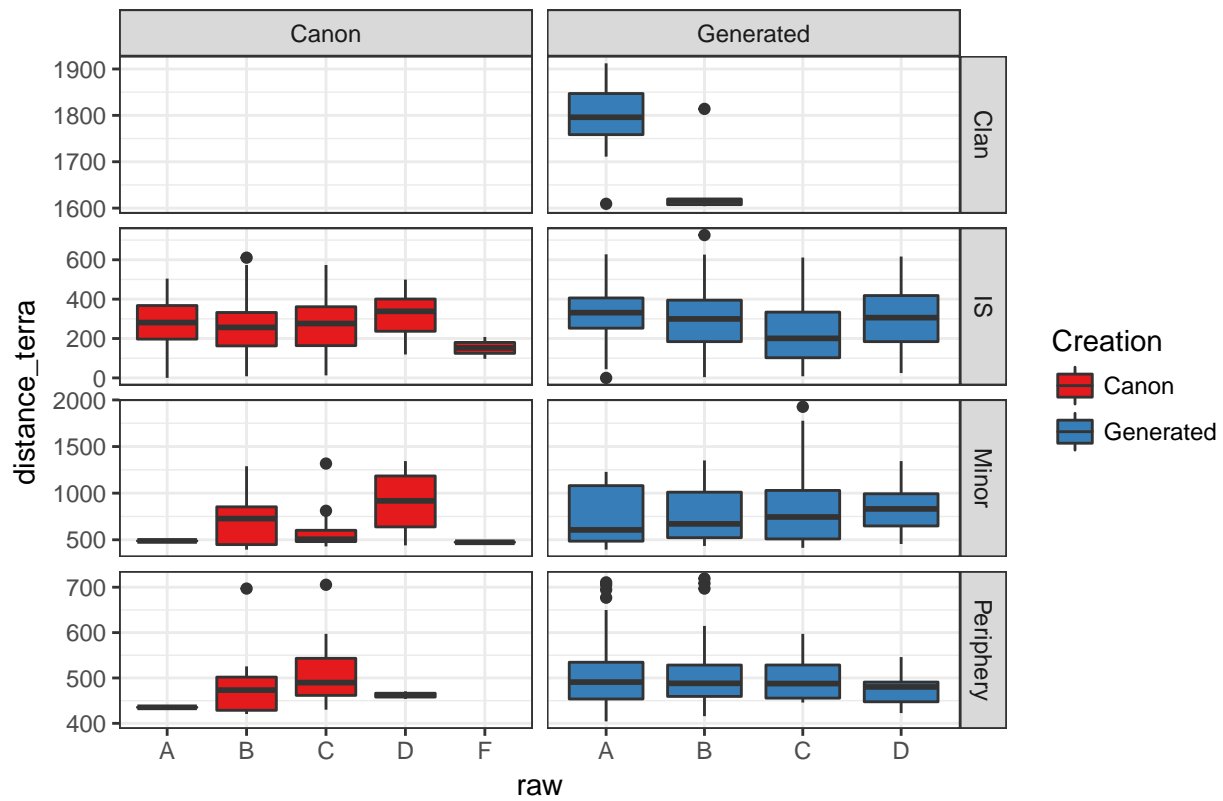
Raw Materials Rating



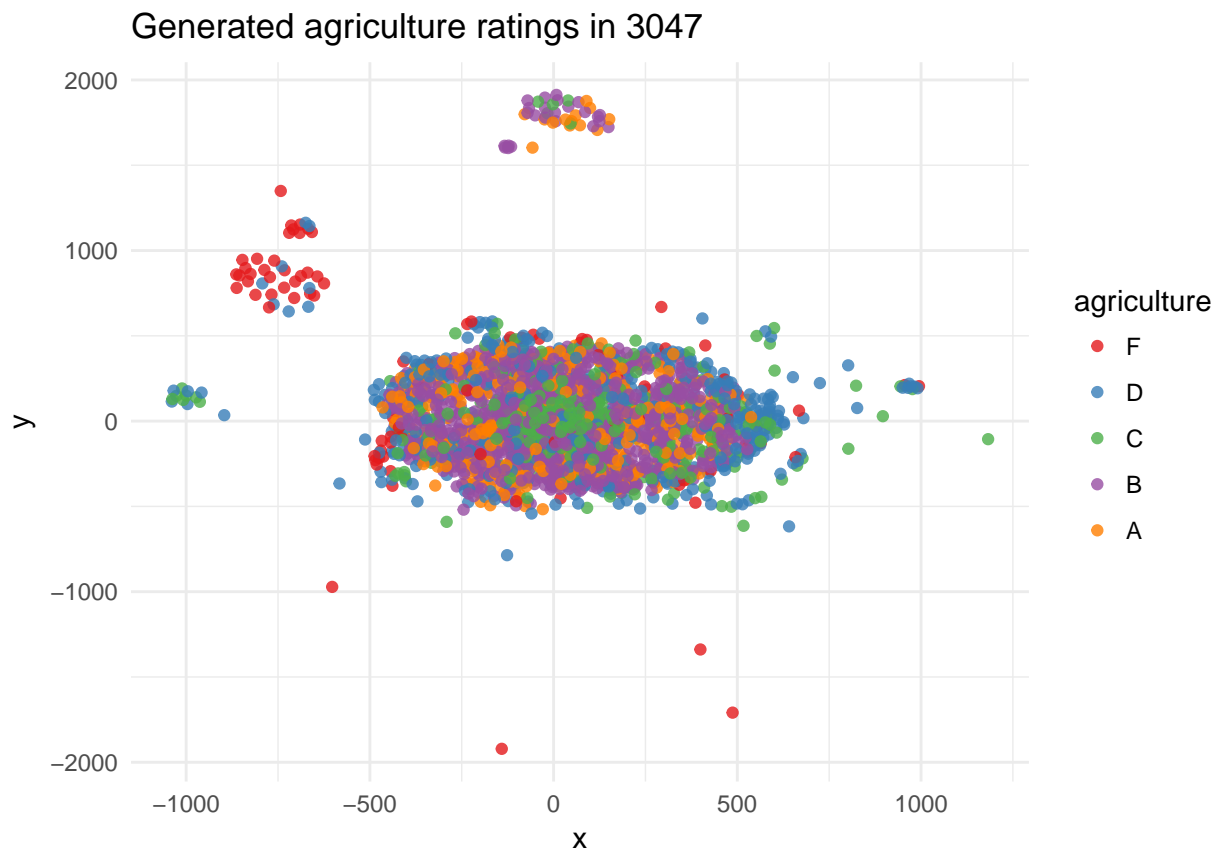
Raw materials rating distribution by faction type



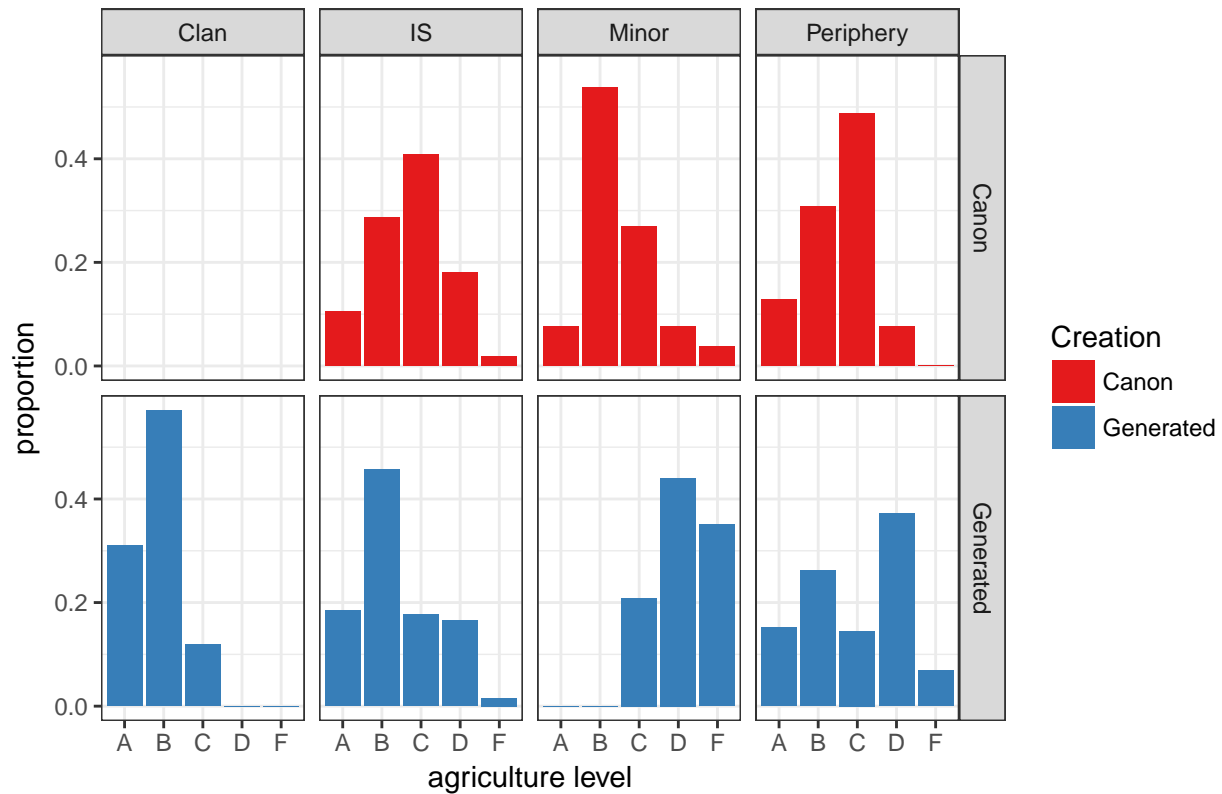
Relationship between raw material rating and distance from terra, by faction



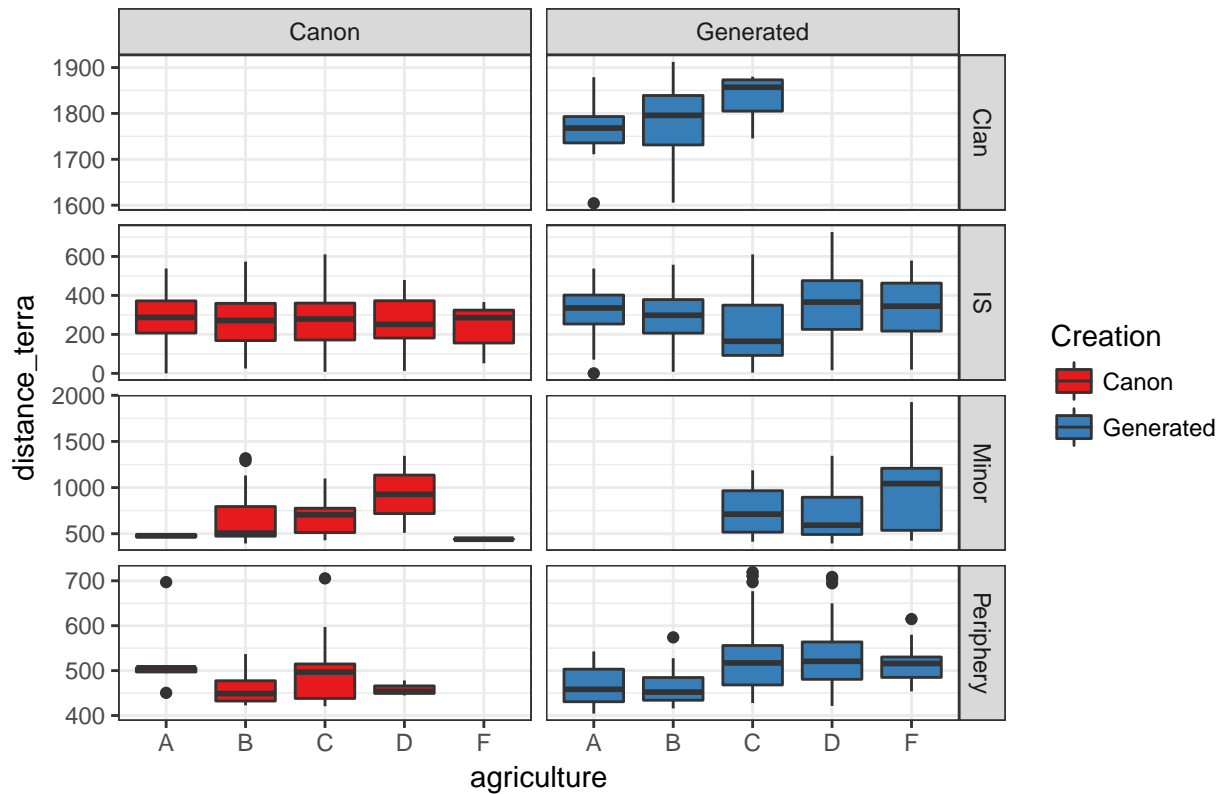
Agriculture Rating



Agriculture rating distribution by faction type



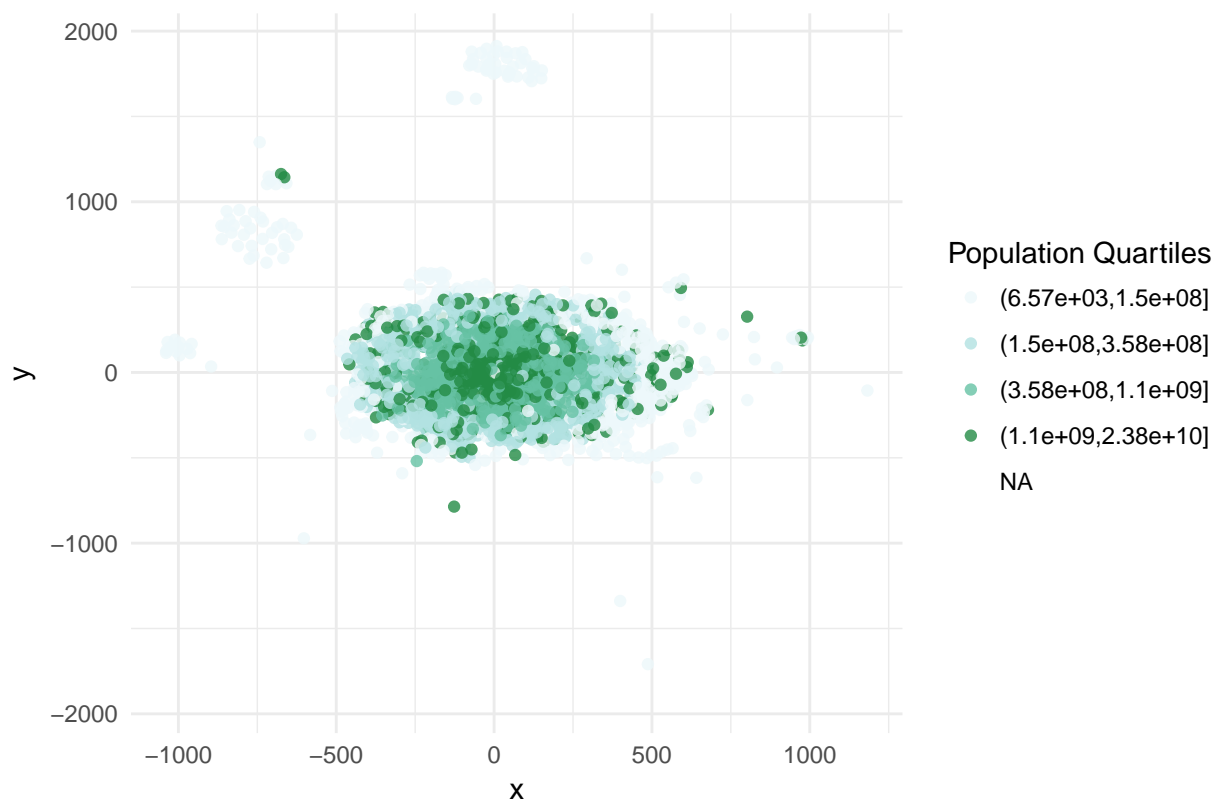
Relationship between agriculture rating and distance from terra, by faction



Population

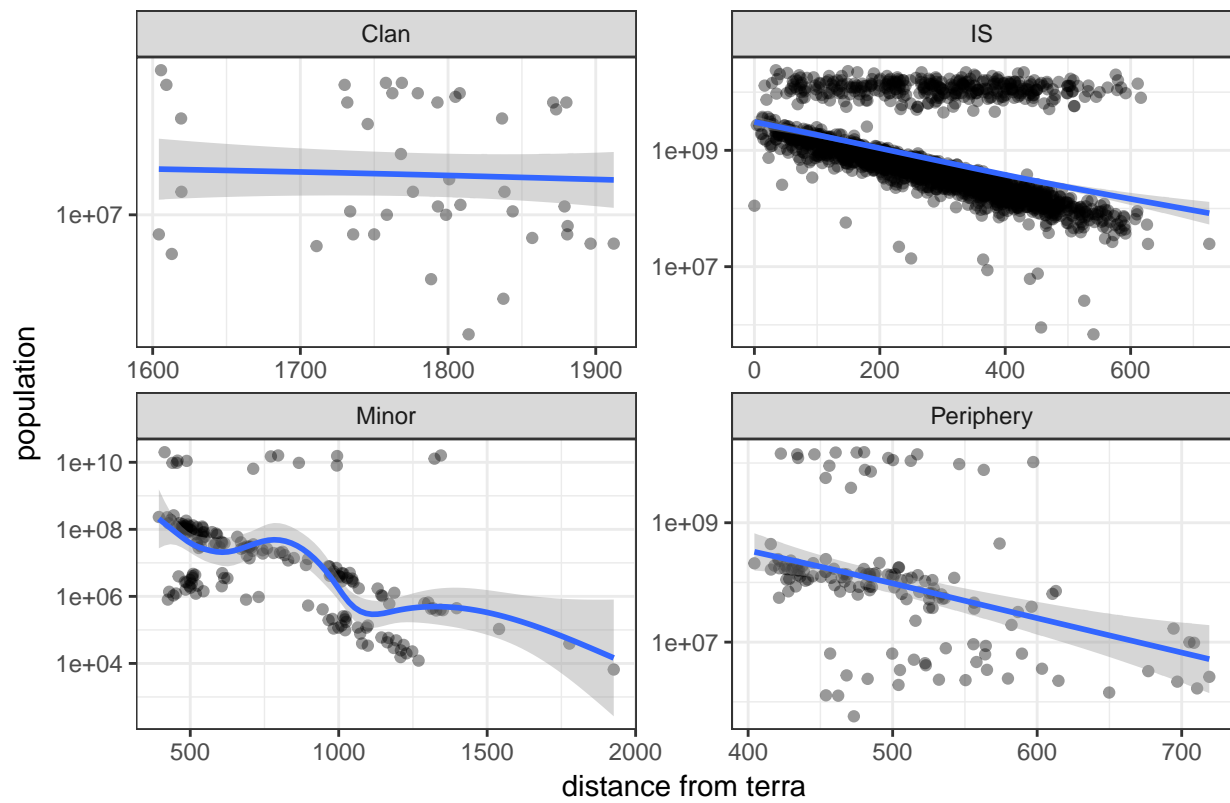
```
## Warning: Removed 1 rows containing missing values (geom_point).
```

Generated population level

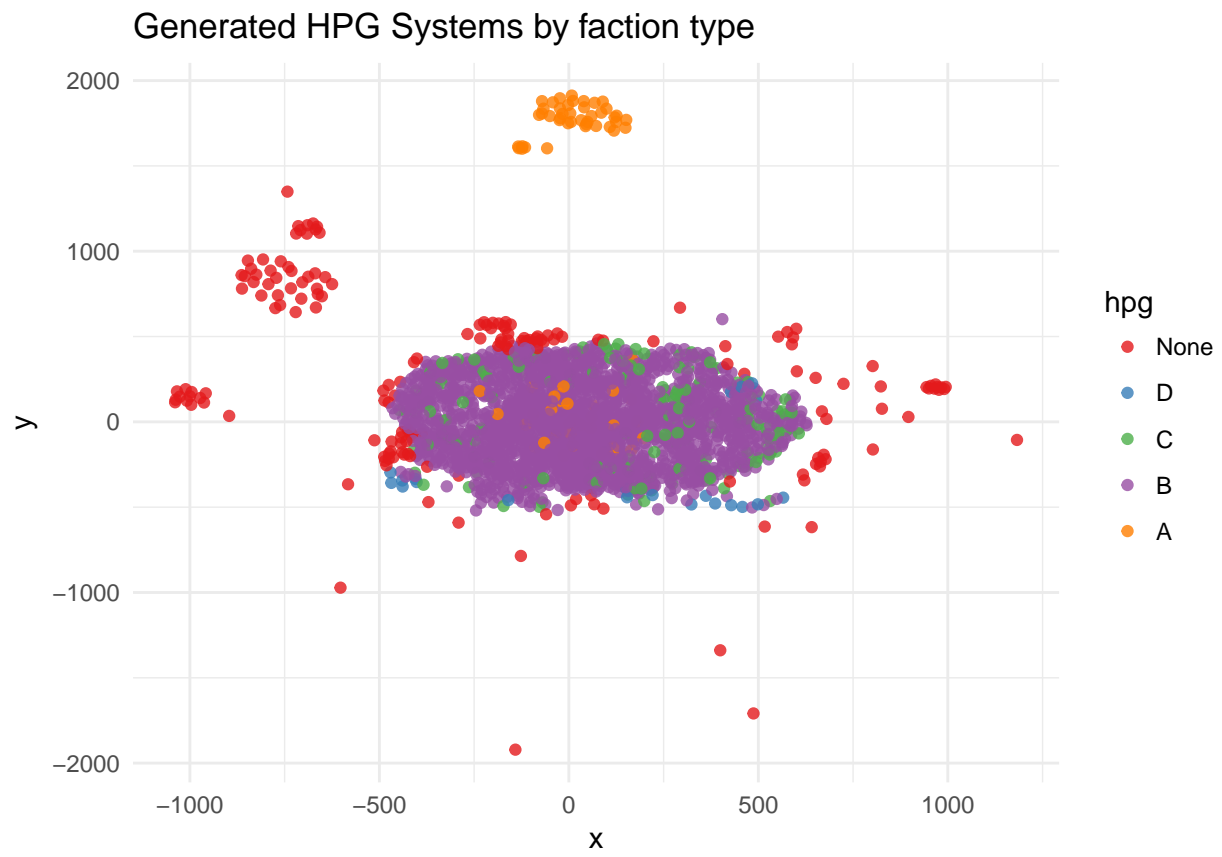


```
## `geom_smooth()` using method = 'gam'
```

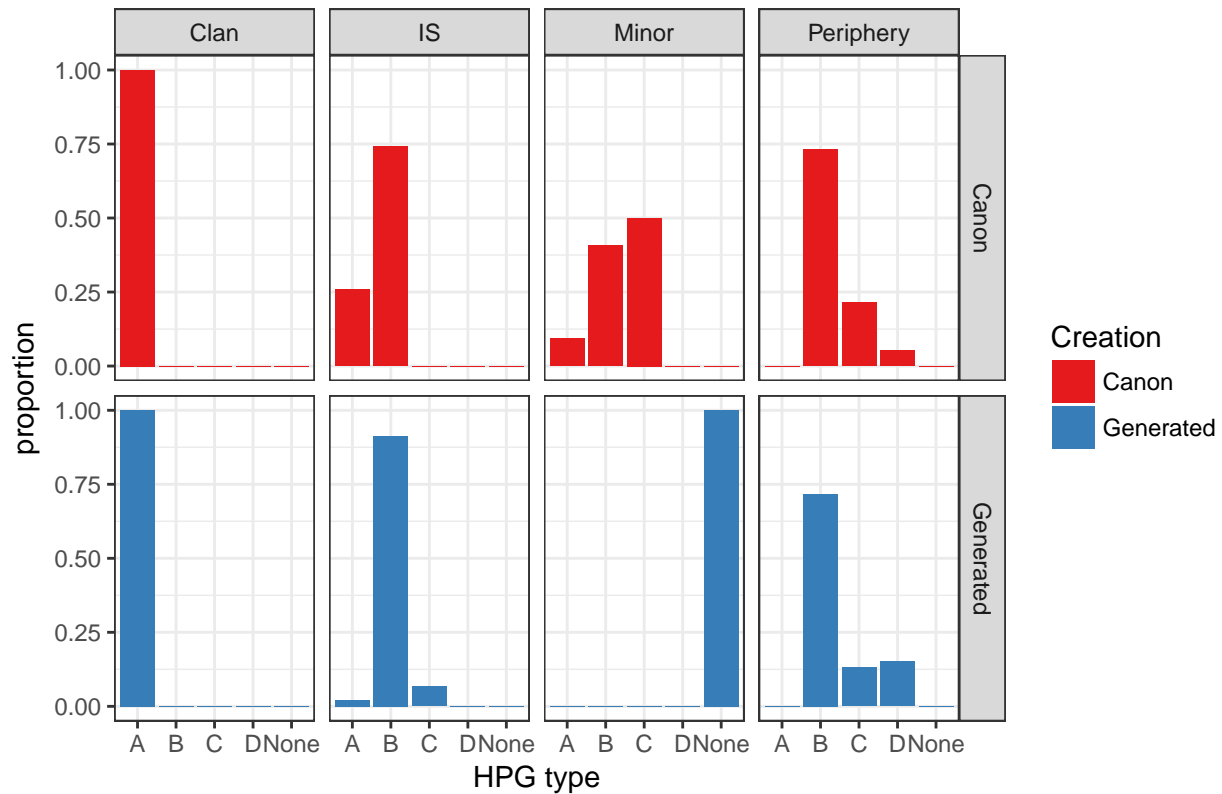
Relationship between population and distance from Terra, by faction type



HPG



HPG rating distribution by faction type



Relationship between HPG rating and distance from terra, by faction type

