From Village to Empire

Modding Guide

by Witch Laboratory

Version 1.2

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General

From Village to Empire supports modding using JSON files.

https://en.wikipedia.org/wiki/JSON

Currently it supports adding new Nations, Buildings, Units, Technologies, Resources and Projectiles, and also modifying existing ones.

Files

Mod files are loaded from *<install path>/mods* directory, and from the Steam Workshop after subscribing. Installed mods are automatically discovered at the start of the game by looking for files named *mod.json* in the mod directory and its subdirectories recursively. One directory should contain one mod only. The file encoding should be UTF-8.

Image (preferred *png; bmp, tga, jpg* also supported) and sound (*WAV, OGG/Vorbis, FLAC*) assets must be specified with a relative path to the json file.

mods/modinfo.json is a special file which lists all the installed mods, and specifies loading order and whether a mod is enabled or disabled. When a new mod is discovered, it is added to the end of the list as enabled by default.

Mods can be reloaded from the Mods menu, or by exiting and restarting the game.

If there are errors while loading the mod, the loading is interrupted and an error message is printed to the log file (Windows: `%APPDATA%\Roaming\FromVillageToEmpire\log.txt`, Linux: `~/.local/share/FromVillageToEmpire/log.txt`) and to the console.

Mod file layout

The root of the JSON document is a JSON object. Possible fields:

- *INFO, locales* (objects)

- *technologies*, *units*, *buildings, nations, resources, projectiles, textureAtlases* (arrays)

INFO should contain the name of the mod, mod protocol version (currently = 1), author, and tags.

Examples

The mod directory contains two example mods (disabled by default) which demonstrate various modding concepts.

Data scheme and relations

Technologies

ID: *string*
cost: *unsigned integer*
group: *unsigned integer* (determines the column in the tech tree)
dependsOn: *array of strings* (IDs of technologies this one depends on)

Resources

ID: *string*
textureAtlasId: *string*
textureIndex: *unsigned integer*
global: *boolean* (whether the resource is global (e.g. science) or local to a city (e.g. food))
accumulate: *boolean* (whether the resource accumulates (e.g. food) or not (e.g. science))

Tile resources

ID: *string*
textureAtlasId: *string*
textureIndex: *unsigned integer*
techReq*: string (ID of technology required to discover this resource)*
tileType: *string* (ID of tile type where this resource appears)
probability: *float* (probability of this resource appearing on a tile)

Resource amount

resId: *string* (ID of resource)
amount: *unsigned integer*

Nations

ID: *string*
aggression: *float* (between 0.0 and 1.0, determines how aggressive the AI will be)
cityIds: *array of strings* (list of IDs of city names)
color1, color2: *array of integers* (it should contain 3 integer numbers 0-255 = RGB)

Projectiles

ID: *string*
textureAtlasId: *string*
textureIndex*: unsigned integer*

Texture atlases

ID: *string*
textureId*: string (ID of texture file)*
cols: *unsigned integer* (number of columns)
rows: *unsigned integer* (number of rows)

Buildings

ID: *string*
textureAtlasId: *string*
textureIndex: *unsigned integer*
buildCost: *unsigned integer*
buildCostsExtra: *array of integers* (build cost modifiers for each terrain type as percentage, -1 if the building can not be built on the terrain type)
techReq: *string* (ID of required technology)
techObs: *string*, optional (ID of technology making this building obsolete)
upgradesTo: *string*, optional (ID of building this one can be upgraded to)
flags: *array of strings*
tileResReq: *string*, optional (ID of required tile resource)
resCost: *resource amount object*, optional
resBoost: *resource amount object*, optional (boosts the resource production in a city by *amount* percent)
resProd: *array of resource amount objects* (resources produced by this building)

Units

ID: *string*
textureAtlasId: *string*
textureIndex: *unsigned integer*
hp: *integer*
moves: *integer*
strength: *integer*
ranger: *integer*
sight: *integer*
buildCost: *unsigned integer*
upkeep: *unsigned integer*
speed: *float* (movement speed, does not affect gameplay)
trainingBuilding: *string* (ID of building)
techReq: *string* (ID of required technology)
techObs: *string*, optional (ID of technology making this unit obsolete)
upgradesTo: *string*, optional (ID of unit this one can be upgraded to)
resCost: *resource amount object*, optional
projectileId: *string*, optional (ID of projectile)
onlyFor: *replacement object*, optional (restricts the unit to a specific nation)
    nationId: *string* (ID of nation)
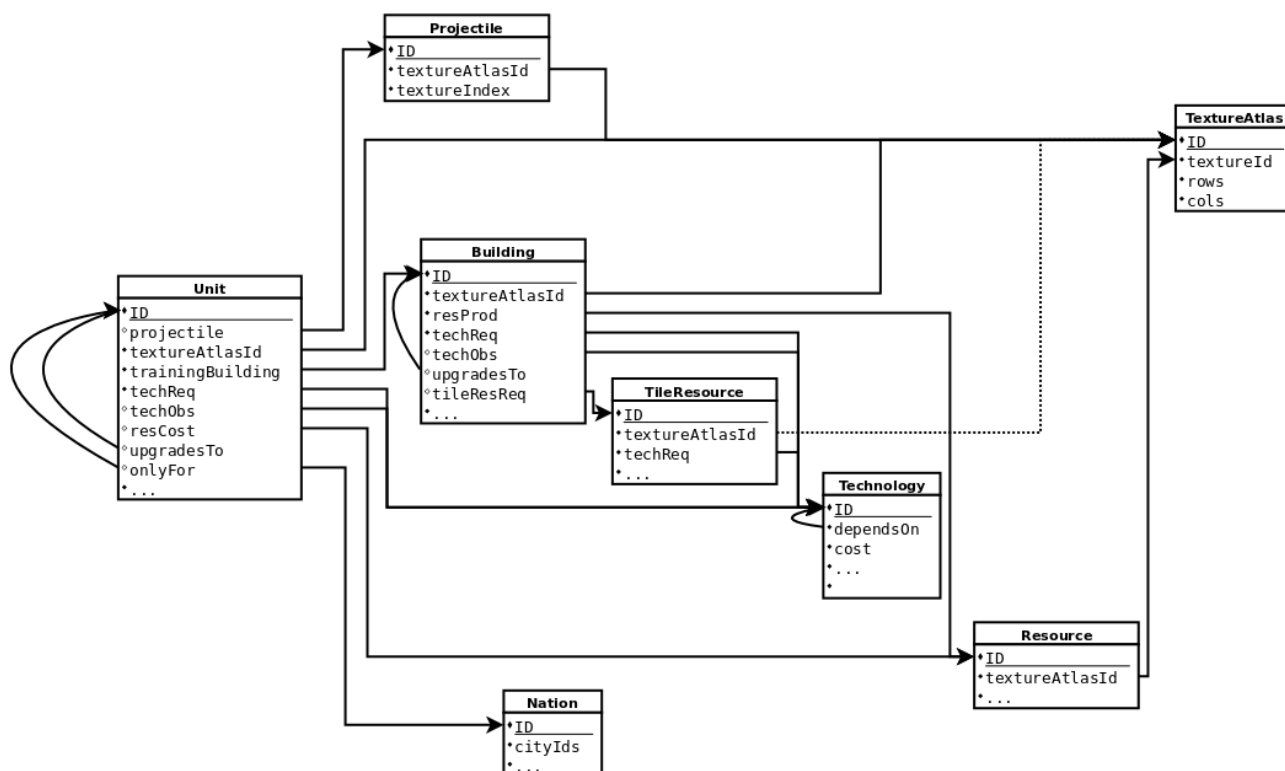   **replaces**: *string* (ID of unit this one replaces)
moveSound: *string* (ID of sound file for movement)
attackSound: *string* (ID of sound file for attacking)
moveCosts: *array of integers* (movement cost modifiers for each terrain type, -1 if the unit can not move to that terrain type)
flags*: array of strings*

Relations

Details

IDs

IDs are used to identify objects so that they can reference each other. It is recommended to use a custom prefix to minimize ID collisions between mods.

Resources and tile resources

Tile resources (e.g. iron ore) are placed on specific tile types (e.g. mountain) by the terrain generator with the given probability. A player can discover the tile resource by researching the required technology. Buildings can require a specific tile resource on a tile to allow building (e.g. iron mine requires iron).

Resources (e.g. iron) are produced by buildings (iron mine). They can be global (e.g. science) or local to a city (e.g. food), and accumulate (e.g. food) or not (e.g. science). Buildings and units can require resources to be produced.

Technology costs

Technology costs are scaled to match the game speed (slow, normal, fast) so they don't exactly match the specified costs. The default technology costs can serve as guideline for the cost of new technologies.

Locales

Textual data to be displayed in game (e.g. names, descriptions) is looked up from the locales table. The table can contain multiple languages (currently the game only supports English ("en"), more languages to be added later). The key for the table is usually the ID of the object, except for building and unit descriptions and names, where the key is *ID_*name and *ID_*desc. For example:

```
"locales": {
    "en": {
        "t_testtech": "Mod test tech name",
        "u_warrior_name": "Warrior name",
        "u_warrior_desc": "Warrior description"
    }
}
```

Flags

Unit flags:
- CanStartCity (for settlers)
- SacrificeReq (the city must sacrifice 1 population to train this unit)
- CanFortify
- CanPillage
- CanTransport (if the unit can transport other units, e.g. caravel)
- Transportable (if the unit can be transported)
- Flying
- Sieger (gets a bonus when attacking cities)
- NUKE
- AntiAircraft (automatically attacks flying units that bomb nearby)
- MoveAfterAttack (can move after attacking, e.g. horseman)

Building flags:
- NoErase (can't be demolished, e.g. city centre)
- OnlyOne (a player can build only one of this)
- OnlyOnePerCity (only one can be built per city)

Textures

Textures are combined into texture atlases for optimal rendering. Different types of textures (e.g. units and buildings) can be packed into the same atlas. A texture atlas is described by the number of rows and columns, indexing begins from zero and increases left to right, top to bottom. The recommended dimensions are 256x384 pixels for units and buildings, and 128x128 pixels for icons.

Tile types

There are 12 tile types: *Grassland, Pine Forest, Ocean, Deep Ocean, Ice Border, Mountain, Ice, Tundra, Desert, Forest, Hills, Ice Ocean*. Currently they are not moddable, but they are referred to by tile resources, and the *buildCostsExtra* field of buildings and *moveCosts* field of units also refer to them.

Modifying existing data

If the ID of an object matches the ID of an already existing one, instead of adding a new object the old one is updated. In this case it's not necessary to specify all the fields, only the ones to be updated. For example to change the strength of the default *Warrior* unit:

```
"units": [
    {
        "ID": "u_warrior",
        "strength": 30,
    }
]
```

Uploading to Steam

Mods can be uploaded to the Steam Workshop from the Mods menu. On the first upload a new Steam Workshop item is created, subsequent uploads update the existing item. The mod directory must be under *<install path>/mods/,* and all the contents of the directory containing the *mod.json* file are included in the mod.

Required fields in the mod.json file in the INFO section:

modname: string
description: string, or array of strings (one string per line)
tags: array of strings,
preview: string, the path to preview image, relative to the mod folder
changenote: string, describing the changes since the last update

Example:

```
"INFO": {
  "modname": "Copper + bronze",
  "description": [
    "Example mod to demonstrate adding resources, buildings,",
    "and updating existing units and technologies",
    " – adds 2 texture atlases",
    " – adds bronze working technology",
    " – adds copper ore tile resource and copper resource",
    " – adds copper mine which produces copper",
    " – updates archer unit type to require copper to train"
  ],
  "version": 1,
  "author": "Witch Laboratory",
  "tags": ["example", "bronze", "copper"],
  "preview": "preview.png",
  "changenote": "Updated mod for Steam Workshop compatibility"
},
```

Uploading a mod might take a long time (anywhere from 10 seconds to 10 minutes) depending on the Steam servers' availability. After uploading the mod will appear in the Steam Workshop in about half hour.

The *Steam Workshop Agreement* also has to be accepted for the mod to be published:
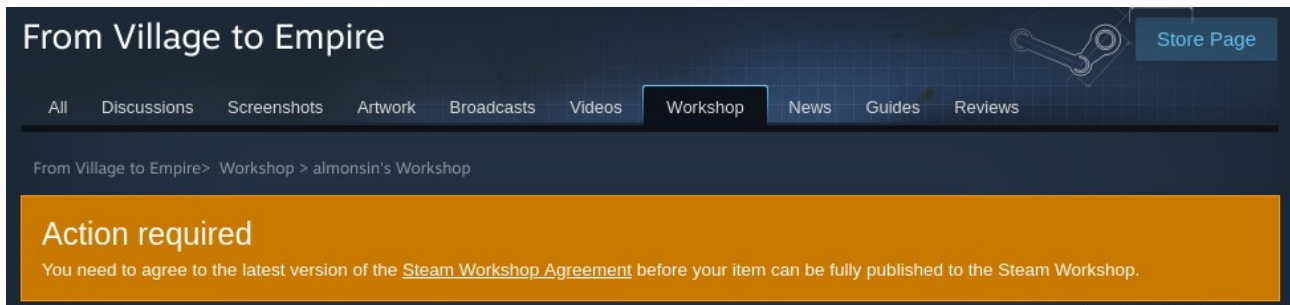
Uploaded mods can be viewed, changed and deleted from *Community Hub / Workshop / Home / Your Files / Files you've posted*
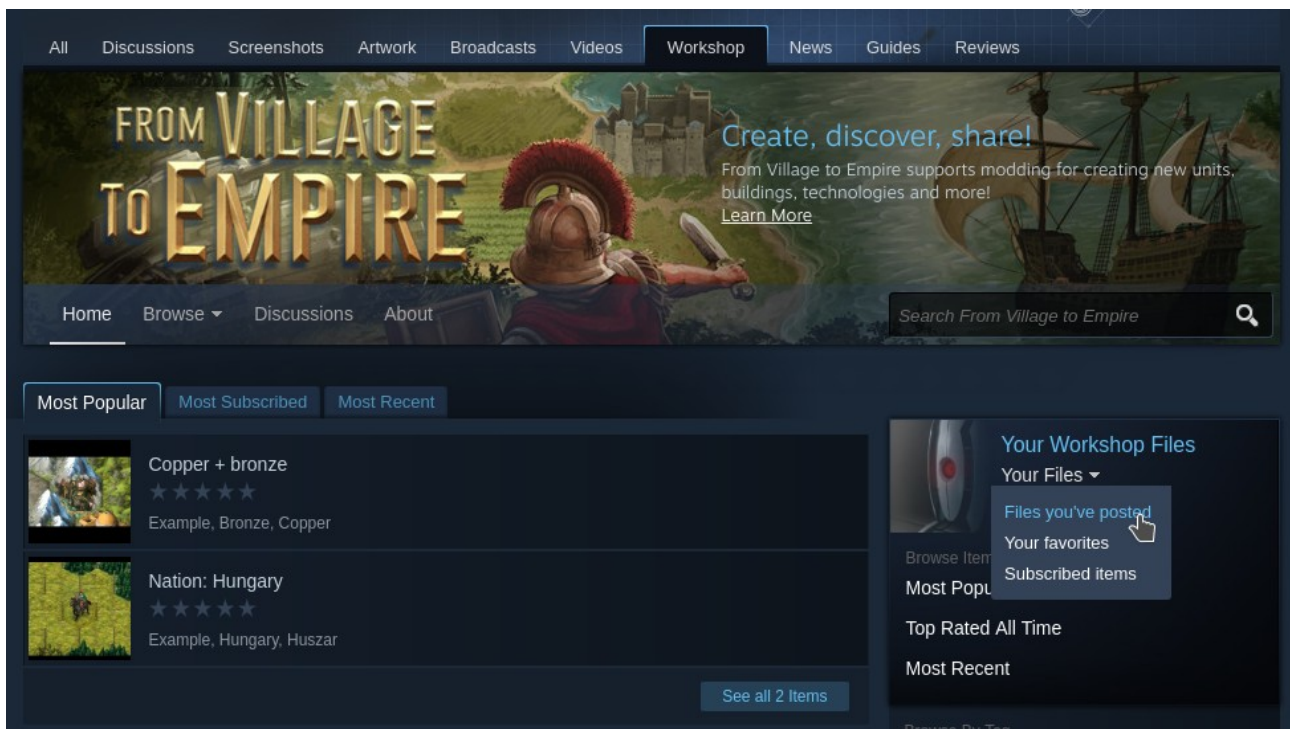
Do not hesitate to ask for help if something doesn't work, this stuff is complicated:

witch.laboratory+support@gmail.com

Good luck!

Reference

Nations

"nations": [
    {
        "ID": "n_the_barbarians",
        "aggression": 1.0,
        "cityIds": [],
        "color1": [128,0,0],
        "color2": [255,0,0]
    },
    {
        "ID": "n_random",
        "aggression": 0.0,
        "cityIds": []
    },
    {
        "ID": "n_japan",
        "aggression": 0.7,
        "cityIds": ["c_tokyo","c_yokohama","c_osaka","c_nagoya","c_sapporo","c_fukuoka","c_kobe","c_kawasaki","c_kyoto","c_saitama","c_sendai","c_chiba"],
        "color2": [255,0,0],
        "color1": [255,255,255]
    },
    {
        "ID": "n_egypt",
        "aggression": 0.3,
        "cityIds": ["c_cairo","c_alexandria","c_giza","c_suez","c_luxor","c_mansoura","c_tanta","c_asyut","c_zigazig","c_damietta","c_aswan","c_minya"],
        "color1": [255,255,0],
        "color2": [64,128,255]
    },
    {
        "ID": "n_the_germans",
        "aggression": 0.6,
        "cityIds": ["c_berlin","c_hamburg","c_munich","c_cologne","c_frankfurt","c_essen","c_stuttgart","c_dortmund","c_dusseldorf","c_bremen","c_hanover","c_dresden"],
        "color1": [0,0,0],
        "color2": [255,255,0]
    },
    {
        "ID": "n_china",
        "aggression": 0.6,
        "cityIds": ["c_beijing","c_shanghai","c_guangzhou","c_chongqing","c_hangzhou","c_wuhan","c_chengdu","c_tianjin","c_xi_an","c_jinan","c_shenzhen","c_nanjing"],
        "color1": [255,255,0],
        "color2": [255,0,0]
    },
    {
        "ID": "n_the_romans",
        "aggression": 0.7,
        "cityIds": ["c_rome","c_antium","c_cumae","c_pompeii","c_capua","c_ostia","c_aquincum","c_florentia","c_arrabona","c_herculaneum","c_brigetio","c_gorsium"],
        "color2": [255,255,0],
        "color1": [255,0,0]
    },
    {
        "ID": "n_greece",
        "aggression": 0.4,
        "cityIds": ["c_athens","c_sparta","c_thebes","c_argos","c_corinth","c_lesbos","c_ephesus","c_rhodes","c_miletus","c_crete","c_delphi","c_apollonia"],
        "color1": [255,255,255],
        "color2": [0,0,255]
    },
    {
        "ID": "n_mongolia",
        "aggression": 0.7,
        "cityIds": ["c_ulaanbaatar","c_erdenet","c_darkhan","c_choibalsan","c_nalaikh","c_bayankhongor","c_khovd","c_arvaikheer","c_ulaangom","c_baganuur","c_sainshand","c_tsetserleg"],
        "color1": [0,0,255],
        "color2": [255,0,0]
    },
    {
        "ID": "n_india",
        "aggression": 0.6,
        "cityIds": ["c_mumbai","c_delhi","c_bangalore","c_hyderabad","c_ahmedabad","c_chennai","c_kolkata","c_surat","c_jaipur","c_lucknow","c_bhopal","c_patna"],
        "color1": [255, 128, 0],
        "color2": [0, 255, 0]
    },
    {
        "ID": "n_the_norsemen",
        "aggression": 0.6,
        "cityIds": ["c_oslo","c_copenhagen","c_stockholm","c_gothenburg","c_bergen","c_aarhus","c_reykjavik","c_stavanger","c_trondheim","c_uppsala","c_odense","c_aalborg"],
        "color1": [255,0,0],
        "color2": [0,0,0]
    },
    {
        "ID": "n_assyria",
        "aggression": 0.4,
        "cityIds": ["c_assur","c_niniveh","c_kar-tukulti-ninurta","c_arbailu","c_dur-sharrukin","c_halab","c_carchemish","c_harran","c_imgur-enlil","c_qatna","c_sareisa","c_til_barsip"],
        "color1": [255,0,0],
        "color2": [0,0,255]
    }
]

Buildings

"buildings": [
    {
        "ID": "b_construction",
        "buildCost": 0,
        "buildCostsExtra": [-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1],
        "flags": ["NoErase"],
        "techReq": "t_farming",
        "textureAtlasId": "buildings",
        "textureIndex": 2
    },
    {
        "ID": "b_city_centre",
        "buildCost": 0,
        "buildCostsExtra": [-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1],
        "flags": ["NoErase"],
        "resProd": [{"amount":3,"resId":"r_food"},{"amount":5,"resId":"r_science"},
             {"amount":5,"resId":"r_production"},{"amount":3,"resId":"r_gold"}],
        "techReq": "t_farming",
        "textureAtlasId": "buildings",
        "textureIndex": 3
    },
    {
        "ID": "b_farm",
        "buildCost": 40,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,-1,-1,-1,50,-1],
        "flags": [],
        "resProd": [{"amount":2,"resId":"r_food"}],
        "techObs": "t_education",
        "techReq": "t_farming",
        "textureAtlasId": "buildings",
        "textureIndex": 4,
        "upgradesTo": "b_farm_ii"
    },
    {
        "ID": "b_barracks",
        "buildCost": 50,
        "buildCostsExtra": [0,25,-1,-1,-1,-1,50,50,50,25,25,-1],
        "flags": [],
        "techReq": "t_military",
        "textureAtlasId": "buildings",
        "textureIndex": 5
    },
    {
        "ID": "b_lumbermill",
        "buildCost": 40,
        "buildCostsExtra": [-1,0,-1,-1,-1,-1,-1,-1,-1,0,-1,-1],
        "flags": [],
        "resProd": [{"amount":2,"resId":"r_production"}],
        "techObs": "t_nuclear_physics",
        "techReq": "t_carpentry",
        "textureAtlasId": "buildings",
        "textureIndex": 6,
        "upgradesTo": "b_factory"
    },
    {
        "ID": "b_harbour",
        "buildCost": 50,
        "buildCostsExtra": [-1,-1,0,-1,-1,-1,-1,-1,-1,-1,-1,-1],
        "flags": [],
        "techReq": "t_boat_building",
        "textureAtlasId": "buildings",
        "textureIndex": 7
    },
    {
        "ID": "b_fishing_boats",
        "buildCost": 50,
        "buildCostsExtra": [-1,-1,0,-1,-1,-1,-1,-1,-1,-1,-1,-1],
        "flags": [],
        "resProd": [{"amount":3,"resId":"r_food"}],
        "techReq": "t_boat_building",
        "textureAtlasId": "buildings",
        "textureIndex": 8,
        "tileResReq": "tr_fish"
    },
    {
        "ID": "b_library",
        "buildCost": 50,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,25,25,-1,25,-1],
        "flags": [],
        "resProd": [{"amount":2,"resId":"r_science"}],
        "techObs": "t_education",
        "techReq": "t_writing",
        "textureAtlasId": "buildings",
        "textureIndex": 9,
        "upgradesTo": "b_school"
    },
    {
        "ID": "b_granary",
        "buildCost": 50,
        "buildCostsExtra": [0,50,-1,-1,-1,-1,-1,25,-1,-1,50,-1],
        "flags": ["OnlyOnePerCity"],
        "techReq": "t_ceramics",
        "textureAtlasId": "buildings",
        "textureIndex": 10
    },
    {

        "ID": "b_airfield",
        "buildCost": 100,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,75,75,-1,-1,-1,-1],
        "flags": [],
        "techReq": "t_flight",
        "textureAtlasId": "buildings",
        "textureIndex": 11
    },
    {
        "ID": "b_market",
        "buildCost": 70,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,75,75,-1,50,-1],
        "flags": [],
        "resProd": [{"amount":3,"resId":"r_gold"}],
        "techObs": "t_banking",
        "techReq": "t_trade",
        "textureAtlasId": "buildings",
        "textureIndex": 12,
        "upgradesTo": "b_bank"
    },
    {
        "ID": "b_farm_ii",
        "buildCost": 70,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,-1,-1,-1,50,-1],
        "flags": [],
        "resProd": [{"amount":3,"resId":"r_food"}],
        "techObs": "t_fertilizers",
        "techReq": "t_domestication",
        "textureAtlasId": "buildings",
        "textureIndex": 13,
        "upgradesTo": "b_plantation"
    },
    {
        "ID": "b_factory",
        "buildCost": 100,
        "buildCostsExtra": [-1,0,-1,-1,-1,-1,-1,-1,-1,0,-1,-1],
        "flags": [],
        "resCost": {
            "amount": 5,
            "resId": "r_coal"
        },
        "resProd": [{"amount":5,"resId":"r_production"}],
        "techReq": "t_manufacturing",
        "textureAtlasId": "buildings",
        "textureIndex": 14
    },
    {
        "ID": "b_school",
        "buildCost": 70,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,25,-1,-1,25,-1],
        "flags": [],
        "resProd": [{"amount":4,"resId":"r_science"}],
        "techReq": "t_education",
        "textureAtlasId": "buildings",
        "textureIndex": 15
    },
    {
        "ID": "b_bank",
        "buildCost": 80,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,75,75,-1,50,-1],
        "flags": [],
        "resProd": [{"amount":5,"resId":"r_gold"}],
        "techReq": "t_banking",
        "textureAtlasId": "buildings",
        "textureIndex": 16
    },
    {
        "ID": "b_iron_mine",
        "buildCost": 70,
        "buildCostsExtra": [-1,-1,-1,-1,-1,0,-1,-1,-1,-1,-1,-1],
        "flags": [],
        "resProd": [{"amount":1,"resId":"r_iron"}],
        "techReq": "t_mining",
        "textureAtlasId": "buildings",
        "textureIndex": 17,
        "tileResReq": "tr_iron"
    },
    {
        "ID": "b_coal_mine",
        "buildCost": 90,
        "buildCostsExtra": [-1,-1,-1,-1,-1,0,-1,-1,-1,-1,-1,-1],
        "flags": [],
        "resProd": [{"amount":1,"resId":"r_coal"}],
        "techReq": "t_manufacturing",
        "textureAtlasId": "buildings",
        "textureIndex": 18,
        "tileResReq": "tr_coal"
    },
    {
        "ID": "b_uranium_mine",
        "buildCost": 150,
        "buildCostsExtra": [-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,0,-1],
        "flags": [],
        "resProd": [{"amount":1,"resId":"r_uranium"}],
        "techReq": "t_nuclear_physics",
        "textureAtlasId": "buildings",

```
        "textureIndex": 19,
        "tileResReq": "tr_uranium"
    },
    {
        "ID": "b_oil_platform",
        "buildCost": 150,
        "buildCostsExtra": [-1,-1,0,-1,-1,-1,-1,-1,-1,-1,-1],
        "flags": [],
        "resProd": [{"amount":1,"resId":"r_oil"}],
        "techReq": "t_chemistry",
        "textureAtlasId": "buildings",
        "textureIndex": 20,
        "tileResReq": "tr_oil"
    },
    {
        "ID": "b_stables",
        "buildCost": 70,
        "buildCostsExtra": [0,25,-1,-1,-1,50,50,50,25,25,-1],
        "flags": [],
        "techObs": "t_otto_engine",
        "techReq": "t_domestication",
        "textureAtlasId": "buildings",
        "textureIndex": 21
    },
    {
        "ID": "b_plantation",
        "buildCost": 130,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,-1,-1,50,-1],
        "flags": [],
        "resProd": [{"amount":4,"resId":"r_food"}],
        "techReq": "t_fertilizers",
        "textureAtlasId": "buildings",
        "textureIndex": 22
    },
    {
        "ID": "b_university",
        "buildCost": 130,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,25,-1,-1,25,-1],
        "flags": ["OnlyOnePerCity"],
        "resBoost": {
            "amount": 50,
            "resId": "r_science"
        },
        "techReq": "t_university",
        "textureAtlasId": "buildings",
        "textureIndex": 23
    },
    {
        "ID": "b_research_lab",
```

Units

```
"units": [
    {
        "ID": "u_explorer",
        "attackSound": "clash",
        "buildCost": 20,
        "flags": ["CanFortify","Transportable"],
        "hp": 15,
        "moveCosts": [10,10,-1,-1,-1,30,10,10,10,10,-1],
        "moveSound": "running",
        "moves": 20,
        "range": 1,
        "sight": 3,
        "speed": 3.0,
        "strength": 5,
        "techObs": "t_horse_riding",
        "techReq": "t_farming",
        "textureAtlasId": "units",
        "textureIndex": 12,
        "trainingBuilding": "b_city_centre",
        "upkeep": 1
    },
    {
        "ID": "u_warrior",
        "attackSound": "clash",
        "buildCost": 30,
        "flags": ["CanFortify","CanPillage","Transportable"],
        "hp": 50,
        "moveCosts": [10,20,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "running",
        "moves": 20,
        "range": 1,
        "sight": 2,
        "speed": 2.5,
        "strength": 10,
        "techObs": "t_gunpowder",
        "techReq": "t_military",
        "textureAtlasId": "units",
        "textureIndex": 37,
        "trainingBuilding": "b_barracks",
        "upgradesTo": "u_swordsman",
        "upkeep": 1
    },
    {
        "ID": "u_archer",
        "attackSound": "bow",
        "buildCost": 30,
        "flags": ["CanFortify","CanPillage","Transportable"],
```

```
        "buildCost": 200,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,25,-1,-1,25,-1],
        "flags": [],
        "resCost": {
            "amount": 5,
            "resId": "r_oil"
        },
        "resProd": [{"amount":8,"resId":"r_science"}],
        "techReq": "t_chemistry",
        "textureAtlasId": "buildings",
        "textureIndex": 24
    },
    {
        "ID": "b_stock_exchange",
        "buildCost": 150,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,75,75,-1,50,-1],
        "flags": ["OnlyOnePerCity"],
        "resBoost": {
            "amount": 50,
            "resId": "r_gold"
        },
        "techReq": "t_economics",
        "textureAtlasId": "buildings",
        "textureIndex": 25
    },
    {
        "ID": "b_nuclear_plant",
        "buildCost": 200,
        "buildCostsExtra": [-1,0,-1,-1,-1,-1,-1,-1,-1,0,-1,-1],
        "flags": [],
        "resCost": {
            "amount": 5,
            "resId": "r_uranium"
        },
        "resProd": [{"amount":7,"resId":"r_production"}],
        "techReq": "t_nuclear_physics",
        "textureAtlasId": "buildings",
        "textureIndex": 26
    },
    {
        "ID": "b_launch_pad",
        "buildCost": 250,
        "buildCostsExtra": [0,-1,-1,-1,-1,-1,-1,0,-1,-1,-1,-1],
        "flags": [],
        "techReq": "t_spacefaring",
        "textureAtlasId": "buildings",
        "textureIndex": 27
    }
]
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        "sight": 2,
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        "strength": 10,
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        "techReq": "t_archery",
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        "upgradesTo": "u_crossbowman",
        "upkeep": 1
    },
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        "attackSound": "",
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        "moveSound": "running",
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        "range": 0,
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        "speed": 1.5,
        "strength": 0,
        "techReq": "t_farming",
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        "upkeep": 1
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        "attackSound": "bow",
        "buildCost": 40,
        "flags": ["CanFortify","CanPillage","CanTransport"],
        "hp": 40,
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        "range": 1,
        "sight": 2,
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      "techObs": "t_sailing",
      "techReq": "t_boat_building",
      "textureAtlasId": "units",
      "textureIndex": 36,
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      "upgradesTo": "u_caravel",
      "upkeep": 1
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      "ID": "u_tank",
      "attackSound": "tank",
      "buildCost": 150,
      "flags": ["CanFortify","CanPillage","Transportable"],
      "hp": 100,
      "moveCosts": [10,15,-1,-1,-1,-1,15,10,20,15,15,-1],
      "moveSound": "motor",
      "moves": 40,
      "range": 2,
      "resCost": {
        "amount": 5,
        "resId": "r_oil"
      },
      "sight": 4,
      "speed": 5.0,
      "strength": 45,
      "techReq": "t_otto_engine",
      "textureAtlasId": "units",
      "textureIndex": 35,
      "trainingBuilding": "b_factory",
      "upkeep": 5
    },
    {
      "ID": "u_caravel",
      "attackSound": "bow",
      "buildCost": 50,
      "flags": ["CanFortify","CanPillage","CanTransport"],
      "hp": 50,
      "moveCosts": [-1,-1,10,15,-1,-1,-1,-1,-1,-1,-1,-1],
      "moveSound": "boat",
      "moves": 30,
      "projectile": "p_arrow",
      "range": 2,
      "sight": 3,
      "speed": 3.0,
      "strength": 15,
      "techObs": "t_steam_engine",
      "techReq": "t_sailing",
      "textureAtlasId": "units",
      "textureIndex": 4,
      "trainingBuilding": "b_harbour",
      "upgradesTo": "u_steamship",
      "upkeep": 2
    },
    {
      "ID": "u_swordsman",
      "attackSound": "clash",
      "buildCost": 50,
      "flags": ["CanFortify","CanPillage","Transportable"],
      "hp": 60,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
      "moveSound": "running",
      "moves": 20,
      "range": 1,
      "resCost": {
        "amount": 2,
        "resId": "r_iron"
      },
      "sight": 2,
      "speed": 2.0,
      "strength": 15,
      "techObs": "t_rifling",
      "techReq": "t_blacksmithing",
      "textureAtlasId": "units",
      "textureIndex": 34,
      "trainingBuilding": "b_barracks",
      "upgradesTo": "u_musketeer",
      "upkeep": 2
    },
    {
      "ID": "u_bomber",
      "attackSound": "bombing",
      "buildCost": 100,
      "flags": ["CanFortify","Flying"],
      "hp": 70,
      "moveCosts": [-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1],
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      "moves": 160,
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      "resCost": {
        "amount": 2,
        "resId": "r_oil"
      },
      "sight": 1,
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      "techReq": "t_flight",
      "textureAtlasId": "units",
      "textureIndex": 2,

      "trainingBuilding": "b_airfield",
      "upgradesTo": "u_stealth_bomber",
      "upkeep": 3
    },
    {
      "ID": "u_musketeer",
      "attackSound": "rifle",
      "buildCost": 70,
      "flags": ["CanFortify","CanPillage","Transportable"],
      "hp": 70,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
      "moveSound": "running",
      "moves": 20,
      "range": 1,
      "sight": 2,
      "speed": 2.0,
      "strength": 20,
      "techObs": "t_machine_gun",
      "techReq": "t_gunpowder",
      "textureAtlasId": "units",
      "textureIndex": 22,
      "trainingBuilding": "b_barracks",
      "upgradesTo": "u_rifleman",
      "upkeep": 3
    },
    {
      "ID": "u_rifleman",
      "attackSound": "rifle",
      "buildCost": 90,
      "flags": ["CanFortify","CanPillage","Transportable"],
      "hp": 90,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
      "moveSound": "running",
      "moves": 20,
      "range": 1,
      "sight": 2,
      "speed": 2.0,
      "strength": 25,
      "techReq": "t_rifling",
      "textureAtlasId": "units",
      "textureIndex": 26,
      "trainingBuilding": "b_barracks",
      "upgradesTo": "u_modern_infantry",
      "upkeep": 4
    },
    {
      "ID": "u_modern_infantry",
      "attackSound": "machinegun",
      "buildCost": 100,
      "flags": ["CanFortify","CanPillage","Transportable"],
      "hp": 100,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
      "moveSound": "running",
      "moves": 20,
      "range": 1,
      "sight": 2,
      "speed": 2.0,
      "strength": 15,
      "techReq": "t_machine_gun",
      "textureAtlasId": "units",
      "textureIndex": 21,
      "trainingBuilding": "b_barracks",
      "upkeep": 4
    },
    {
      "ID": "u_crossbowman",
      "attackSound": "bow",
      "buildCost": 60,
      "flags": ["CanFortify","CanPillage","Transportable"],
      "hp": 60,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
      "moveSound": "running",
      "moves": 20,
      "projectile": "p_arrow",
      "range": 2,
      "sight": 2,
      "speed": 2.5,
      "strength": 20,
      "techObs": "t_rifling",
      "techReq": "t_mercenaries",
      "textureAtlasId": "units",
      "textureIndex": 8,
      "trainingBuilding": "b_barracks",
      "upgradesTo": "u_rifleman",
      "upkeep": 2
    },
    {
      "ID": "u_catapult",
      "attackSound": "bow",
      "buildCost": 40,
      "flags": ["CanFortify","CanPillage","Transportable","Sieger"],
      "hp": 20,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
      "moveSound": "catapult",
      "moves": 20,
      "projectile": "p_stone",
      "range": 2,
      "sight": 2,
      "speed": 1.5,
      "strength": 15,
      "techObs": "t_gunpowder",
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        "techReq": "t_siege_weapons",
        "textureAtlasId": "units",
        "textureIndex": 5,
        "trainingBuilding": "b_lumbermill",
        "upgradesTo": "u_cannon",
        "upkeep": 2
    },
    {
        "ID": "u_cannon",
        "attackSound": "cannon",
        "buildCost": 60,
        "flags": ["CanFortify","CanPillage","Transportable","Sieger"],
        "hp": 30,
        "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "catapult",
        "moves": 20,
        "projectile": "p_cannonball",
        "range": 2,
        "resCost": {
            "amount": 5,
            "resId": "r_iron"
        },
        "sight": 2,
        "speed": 1.5,
        "strength": 40,
        "techObs": "t_rockets",
        "techReq": "t_gunpowder",
        "textureAtlasId": "units",
        "textureIndex": 3,
        "trainingBuilding": "b_factory",
        "upgradesTo": "u_rocket_artillery",
        "upkeep": 2
    },
    {
        "ID": "u_rocket_artillery",
        "attackSound": "rocket_launch",
        "buildCost": 80,
        "flags": ["CanFortify","CanPillage","Transportable","Sieger"],
        "hp": 80,
        "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "motor",
        "moves": 30,
        "projectile": "p_rocket",
        "range": 2,
        "sight": 2,
        "speed": 1.5,
        "strength": 50,
        "techReq": "t_rockets",
        "textureAtlasId": "units",
        "textureIndex": 27,
        "trainingBuilding": "b_factory",
        "upkeep": 2
    },
    {
        "ID": "u_steamship",
        "attackSound": "cannon",
        "buildCost": 70,
        "flags": ["CanFortify","CanPillage","CanTransport"],
        "hp": 100,
        "moveCosts": [-1,-1,10,15,-1,-1,-1,-1,-1,-1,-1,-1],
        "moveSound": "boat",
        "moves": 40,
        "projectile": "p_cannonball",
        "range": 2,
        "resCost": {
            "amount": 5,
            "resId": "r_coal"
        },
        "sight": 4,
        "speed": 3.0,
        "strength": 20,
        "techObs": "t_otto_engine",
        "techReq": "t_steam_engine",
        "textureAtlasId": "units",
        "textureIndex": 33,
        "trainingBuilding": "b_harbour",
        "upgradesTo": "u_destroyer",
        "upkeep": 3
    },
    {
        "ID": "u_destroyer",
        "attackSound": "tank",
        "buildCost": 100,
        "flags": ["CanFortify","CanPillage","CanTransport"],
        "hp": 120,
        "moveCosts": [-1,-1,15,10,-1,-1,-1,-1,-1,-1,-1,-1],
        "moveSound": "boat",
        "moves": 50,
        "range": 2,
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            "resId": "r_oil"
        },
        "sight": 5,
        "speed": 3.0,
        "strength": 40,
        "techReq": "t_otto_engine",
        "textureAtlasId": "units",
        "textureIndex": 9,
        "trainingBuilding": "b_harbour",
        "upkeep": 5
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    },
    {
        "ID": "u_horseman",
        "attackSound": "clash",
        "buildCost": 30,
        "flags": ["CanFortify","CanPillage","Transportable","MoveAfterAttack"],
        "hp": 30,
        "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "horse",
        "moves": 30,
        "range": 1,
        "sight": 3,
        "speed": 3.0,
        "strength": 10,
        "techObs": "t_gunpowder",
        "techReq": "t_horse_riding",
        "textureAtlasId": "units",
        "textureIndex": 16,
        "trainingBuilding": "b_stables",
        "upgradesTo": "u_knight",
        "upkeep": 1
    },
    {
        "ID": "u_knight",
        "attackSound": "clash",
        "buildCost": 50,
        "flags": ["CanFortify","CanPillage","Transportable","MoveAfterAttack"],
        "hp": 40,
        "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "horse",
        "moves": 30,
        "range": 1,
        "resCost": {
            "amount": 3,
            "resId": "r_iron"
        },
        "sight": 3,
        "speed": 3.0,
        "strength": 20,
        "techObs": "t_gunpowder",
        "techReq": "t_chivalry",
        "textureAtlasId": "units",
        "textureIndex": 17,
        "trainingBuilding": "b_stables",
        "upgradesTo": "u_dragoon",
        "upkeep": 1
    },
    {
        "ID": "u_dragoon",
        "attackSound": "rifle",
        "buildCost": 70,
        "flags": ["CanFortify","CanPillage","Transportable","MoveAfterAttack"],
        "hp": 50,
        "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "horse",
        "moves": 30,
        "range": 1,
        "sight": 3,
        "speed": 3.0,
        "strength": 20,
        "techObs": "t_otto_engine",
        "techReq": "t_gunpowder",
        "textureAtlasId": "units",
        "textureIndex": 10,
        "trainingBuilding": "b_stables",
        "upgradesTo": "u_tank",
        "upkeep": 1
    },
    {
        "ID": "u_stealth_bomber",
        "attackSound": "bombing",
        "buildCost": 120,
        "flags": ["CanFortify","Flying"],
        "hp": 80,
        "moveCosts": [-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1],
        "moveSound": "bomber",
        "moves": 200,
        "range": 1,
        "resCost": {
            "amount": 3,
            "resId": "r_oil"
        },
        "sight": 1,
        "speed": 4.0,
        "strength": 50,
        "techReq": "t_computers",
        "textureAtlasId": "units",
        "textureIndex": 32,
        "trainingBuilding": "b_airfield",
        "upkeep": 4
    },
    {
        "ID": "u_nuclear_bomber",
        "attackSound": "nuke",
        "buildCost": 150,
        "flags": ["CanFortify","Flying","NUKE"],
        "hp": 100,
        "moveCosts": [-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1],
        "moveSound": "bomber",
        "moves": 200,
        "range": 1,
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          "amount": 5,
          "resId": "r_uranium"
      },
      "sight": 1,
      "speed": 3.5,
      "strength": 100,
      "techReq": "t_nuclear_bomb",
      "textureAtlasId": "units",
      "textureIndex": 23,
      "trainingBuilding": "b_airfield",
      "upgradesTo": "u_nuclear_missile",
      "upkeep": 4
   },
   {
      "ID": "u_nuclear_missile",
      "attackSound": "nuke",
      "buildCost": 200,
      "flags": ["CanFortify","Flying","NUKE"],
      "hp": 100,
      "moveCosts": [-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1],
      "moveSound": "rocket_move",
      "moves": 250,
      "range": 1,
      "resCost": {
          "amount": 5,
          "resId": "r_uranium"
      },
      "sight": 2,
      "speed": 5.0,
      "strength": 150,
      "techReq": "t_computers",
      "textureAtlasId": "units",
      "textureIndex": 24,
      "trainingBuilding": "b_airfield",
      "upkeep": 5
   },
   {
      "ID": "u_aa_gun",
      "attackSound": "cannon",
      "buildCost": 60,
      "flags": ["CanFortify","CanPillage","Transportable","AntiAircraft"],
      "hp": 100,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,-1],
      "moveSound": "motor",
      "moves": 30,
      "range": 2,
      "resCost": {
          "amount": 2,
          "resId": "r_oil"
      },
      "sight": 2,
      "speed": 3.0,
      "strength": 15,
      "techReq": "t_flight",
      "textureAtlasId": "units",
      "textureIndex": 0,
      "trainingBuilding": "b_factory",
      "upgradesTo": "u_sam_carrier",
      "upkeep": 3
   },
   {
      "ID": "u_sam_carrier",
      "attackSound": "rocket_launch",
      "buildCost": 70,
      "flags": ["CanFortify","CanPillage","Transportable","AntiAircraft"],
      "hp": 120,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,-1],
      "moveSound": "motor",
      "moves": 30,
      "projectile": "p_rocket",
      "range": 2,
      "resCost": {
          "amount": 3,
          "resId": "r_oil"
      },
      "sight": 2,
      "speed": 3.0,
      "strength": 20,
      "techReq": "t_rockets",
      "textureAtlasId": "units",
      "textureIndex": 28,
      "trainingBuilding": "b_factory",
      "upkeep": 4
   },
   {
      "ID": "u_helicopter",
      "attackSound": "machinegun",
      "buildCost": 100,
      "flags": ["CanFortify","CanPillage"],
      "hp": 120,
      "moveCosts": [10,10,10,10,-1,20,10,10,10,10,10],
      "moveSound": "helicopter",
      "moves": 40,
      "range": 1,
      "resCost": {
          "amount": 4,
          "resId": "r_oil"
      },
      "sight": 3,
      "speed": 4.0,
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      "upkeep": 5
   },
   {
      "ID": "u_mars_rocket",
      "attackSound": "",
      "buildCost": 500,
      "flags": [],
      "hp": 200,
      "moveCosts": [-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1],
      "moveSound": "rocket_move",
      "moves": 0,
      "range": 0,
      "sight": 1,
      "speed": 1.0,
      "strength": 0,
      "techReq": "t_reusable_rockets",
      "textureAtlasId": "units",
      "textureIndex": 20,
      "trainingBuilding": "b_launch_pad",
      "upkeep": 10
   },
   {
      "ID": "u_legionary",
      "attackSound": "clash",
      "buildCost": 55,
      "flags": ["CanFortify","CanPillage","Transportable"],
      "hp": 65,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,-1],
      "moveSound": "running",
      "moves": 20,
      "onlyFor": {
          "nationId": "n_the_romans",
          "replaces": "u_swordsman"
      },
      "range": 1,
      "resCost": {
          "amount": 2,
          "resId": "r_iron"
      },
      "sight": 2,
      "speed": 2.0,
      "strength": 17,
      "techObs": "t_gunpowder",
      "techReq": "t_blacksmithing",
      "textureAtlasId": "units",
      "textureIndex": 18,
      "trainingBuilding": "b_barracks",
      "upgradesTo": "u_musketeer",
      "upkeep": 2
   },
   {
      "ID": "u_chukonu",
      "attackSound": "bow",
      "buildCost": 60,
      "flags": ["CanFortify","CanPillage","Transportable"],
      "hp": 60,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,-1],
      "moveSound": "running",
      "moves": 20,
      "onlyFor": {
          "nationId": "n_china",
          "replaces": "u_crossbowman"
      },
      "projectile": "p_arrow",
      "range": 2,
      "sight": 2,
      "speed": 3.0,
      "strength": 30,
      "techObs": "t_rifling",
      "techReq": "t_mercenaries",
      "textureAtlasId": "units",
      "textureIndex": 7,
      "trainingBuilding": "b_barracks",
      "upgradesTo": "u_rifleman",
      "upkeep": 2
   },
   {
      "ID": "u_hoplite",
      "attackSound": "clash",
      "buildCost": 30,
      "flags": ["CanFortify","CanPillage","Transportable"],
      "hp": 55,
      "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,-1],
      "moveSound": "running",
      "moves": 20,
      "onlyFor": {
          "nationId": "n_greece",
          "replaces": "u_warrior"
      },
      "range": 1,
      "sight": 2,
      "speed": 2.8,
      "strength": 15,
      "techObs": "t_gunpowder",
      "techReq": "t_military",
      "textureAtlasId": "units",
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```
        "textureIndex": 14,
        "trainingBuilding": "b_barracks",
        "upgradesTo": "u_swordsman",
        "upkeep": 1
    },
    {
        "ID": "u_samurai",
        "attackSound": "clash",
        "buildCost": 50,
        "flags": ["CanFortify","CanPillage","Transportable"],
        "hp": 65,
        "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "running",
        "moves": 20,
        "onlyFor": {
            "nationId": "n_japan",
            "replaces": "u_swordsman"
        },
        "range": 1,
        "resCost": {
            "amount": 2,
            "resId": "r_iron"
        },
        "sight": 2,
        "speed": 2.3,
        "strength": 20,
        "techObs": "t_rifling",
        "techReq": "t_blacksmithing",
        "textureAtlasId": "units",
        "textureIndex": 29,
        "trainingBuilding": "b_barracks",
        "upgradesTo": "u_musketeer",
        "upkeep": 2
    },
    {
        "ID": "u_chariot",
        "attackSound": "clash",
        "buildCost": 30,
        "flags": ["CanFortify","CanPillage","Transportable","MoveAfterAttack"],
        "hp": 35,
        "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "horse",
        "moves": 35,
        "onlyFor": {
            "nationId": "n_egypt",
            "replaces": "u_horseman"
        },
        "range": 1,
        "sight": 3,
        "speed": 3.2,
        "strength": 12,
        "techObs": "t_gunpowder",
        "techReq": "t_horse_riding",
        "textureAtlasId": "units",
        "textureIndex": 6,
        "trainingBuilding": "b_stables",
        "upgradesTo": "u_knight",
        "upkeep": 1
    },
    {
        "ID": "u_panzer",
        "attackSound": "tank",
        "buildCost": 150,
        "flags": ["CanFortify","CanPillage","Transportable"],
        "hp": 150,
        "moveCosts": [10,15,-1,-1,-1,-1,15,10,20,15,15,-1],
        "moveSound": "motor",
        "moves": 40,
        "onlyFor": {
            "nationId": "n_the_germans",
            "replaces": "u_tank"
        },
        "range": 3,
        "resCost": {
            "amount": 5,
            "resId": "r_oil"
        },
        "sight": 4,
        "speed": 5.5,
        "strength": 50,
        "techReq": "t_otto_engine",
        "textureAtlasId": "units",
        "textureIndex": 25,
        "trainingBuilding": "b_factory",
        "upkeep": 5
    },
    {
        "ID": "u_horse_archer",
        "attackSound": "bow",
        "buildCost": 30,
        "flags": ["CanFortify","CanPillage","Transportable","MoveAfterAttack"],
        "hp": 30,
        "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "horse",
        "moves": 30,
        "onlyFor": {
            "nationId": "n_mongolia",
            "replaces": "u_horseman"
        },
        "projectile": "p_arrow",
        "range": 2,
        "sight": 3,
        "speed": 3.2,
        "strength": 10,
        "techObs": "t_gunpowder",
        "techReq": "t_horse_riding",
        "textureAtlasId": "units",
        "textureIndex": 15,
        "trainingBuilding": "b_stables",
        "upgradesTo": "u_knight",
        "upkeep": 1
    },
    {
        "ID": "u_elephant",
        "attackSound": "clash",
        "buildCost": 50,
        "flags": ["CanFortify","CanPillage","Transportable","Sieger"],
        "hp": 60,
        "moveCosts": [10,20,-1,-1,-1,30,20,10,20,20,20,-1],
        "moveSound": "horse",
        "moves": 20,
        "onlyFor": {
            "nationId": "n_india",
            "replaces": "u_knight"
        },
        "range": 1,
        "sight": 3,
        "speed": 2.5,
        "strength": 25,
        "techObs": "t_gunpowder",
        "techReq": "t_chivalry",
        "textureAtlasId": "units",
        "textureIndex": 11,
        "trainingBuilding": "b_stables",
        "upgradesTo": "u_dragoon",
        "upkeep": 1
    },
    {
        "ID": "u_longship",
        "attackSound": "bow",
        "buildCost": 40,
        "flags": ["CanFortify","CanPillage","CanTransport"],
        "hp": 40,
        "moveCosts": [-1,-1,10,15,-1,-1,-1,-1,-1,-1,-1,-1],
        "moveSound": "boat",
        "moves": 30,
        "onlyFor": {
            "nationId": "n_the_norsemen",
            "replaces": "u_trireme"
        },
        "range": 1,
        "sight": 2,
        "speed": 2.8,
        "strength": 10,
        "techObs": "t_sailing",
        "techReq": "t_boat_building",
        "textureAtlasId": "units",
        "textureIndex": 19,
        "trainingBuilding": "b_harbour",
        "upgradesTo": "u_caravel",
        "upkeep": 1
    },
    {
        "ID": "u_siege_tower",
        "attackSound": "clash",
        "buildCost": 40,
        "flags": ["CanFortify","CanPillage","Transportable","Sieger"],
        "hp": 40,
        "moveCosts": [10,20,-1,-1,-1,-1,20,10,20,20,20,-1],
        "moveSound": "catapult",
        "moves": 20,
        "onlyFor": {
            "nationId": "n_assyria",
            "replaces": "u_catapult"
        },
        "range": 1,
        "sight": 2,
        "speed": 1.3,
        "strength": 18,
        "techObs": "t_gunpowder",
        "techReq": "t_siege_weapons",
        "textureAtlasId": "units",
        "textureIndex": 31,
        "trainingBuilding": "b_lumbermill",
        "upgradesTo": "u_cannon",
        "upkeep": 2
    }
]
```

Technologies

```
"technologies": [
    {
        "ID": "t_farming",
        "cost": 20,
        "dependsOn": [],
        "group": 0
    },
    {
        "ID": "t_carpentry",
        "cost": 20,
        "dependsOn": ["t_farming"],
        "group": 1
    },
    {
        "ID": "t_military",
        "cost": 20,
        "dependsOn": ["t_farming"],
        "group": 1
    },
    {
        "ID": "t_writing",
        "cost": 50,
        "dependsOn": ["t_farming"],
        "group": 1
    },
    {
        "ID": "t_ceramics",
        "cost": 50,
        "dependsOn": ["t_farming"],
        "group": 1
    },
    {
        "ID": "t_boat_building",
        "cost": 60,
        "dependsOn": ["t_carpentry"],
        "group": 2
    },
    {
        "ID": "t_siege_weapons",
        "cost": 60,
        "dependsOn": ["t_carpentry"],
        "group": 2
    },
    {
        "ID": "t_domestication",
        "cost": 70,
        "dependsOn": ["t_carpentry","t_military"],
        "group": 2
    },
    {
        "ID": "t_archery",
        "cost": 70,
        "dependsOn": ["t_military"],
        "group": 2
    },
    {
        "ID": "t_trade",
        "cost": 80,
        "dependsOn": ["t_writing","t_ceramics"],
        "group": 2
    },
    {
        "ID": "t_sailing",
        "cost": 100,
        "dependsOn": ["t_boat_building"],
        "group": 3
    },
    {
        "ID": "t_mining",
        "cost": 120,
        "dependsOn": ["t_siege_weapons"],
        "group": 3
    },
    {
        "ID": "t_horse_riding",
        "cost": 140,
        "dependsOn": ["t_domestication","t_archery"],
        "group": 3
    },
    {
        "ID": "t_education",
        "cost": 160,
        "dependsOn": ["t_trade"],
        "group": 3
    },
    {
        "ID": "t_blacksmithing",
        "cost": 160,
        "dependsOn": ["t_sailing","t_mining"],
        "group": 4
    },
    {
        "ID": "t_chivalry",
        "cost": 180,
        "dependsOn": ["t_mining","t_horse_riding"],
        "group": 4
    },
    {
        "ID": "t_mercenaries",
        "cost": 200,
        "dependsOn": ["t_mining","t_horse_riding"],
        "group": 4
    },
    {
        "ID": "t_banking",
        "cost": 200,
        "dependsOn": ["t_education"],
        "group": 4
    },
    {
        "ID": "t_manufacturing",
        "cost": 250,
        "dependsOn": ["t_blacksmithing"],
        "group": 5
    },
    {
        "ID": "t_gunpowder",
        "cost": 250,
        "dependsOn": ["t_blacksmithing","t_chivalry","t_mercenaries"],
        "group": 5
    },
    {
        "ID": "t_economics",
        "cost": 300,
        "dependsOn": ["t_chivalry","t_banking"],
        "group": 5
    },
    {
        "ID": "t_university",
        "cost": 300,
        "dependsOn": ["t_banking"],
        "group": 5
    },
    {
        "ID": "t_steam_engine",
        "cost": 350,
        "dependsOn": ["t_manufacturing"],
        "group": 6
    },
    {
        "ID": "t_rifling",
        "cost": 350,
        "dependsOn": ["t_manufacturing","t_gunpowder"],
        "group": 6
    },
    {
        "ID": "t_chemistry",
        "cost": 350,
        "dependsOn": ["t_gunpowder","t_economics","t_university"],
        "group": 6
    },
    {
        "ID": "t_otto_engine",
        "cost": 400,
        "dependsOn": ["t_steam_engine","t_rifling","t_chemistry"],
        "group": 7
    },
    {
        "ID": "t_machine_gun",
        "cost": 400,
        "dependsOn": ["t_rifling"],
        "group": 7
    },
    {
        "ID": "t_fertilizers",
        "cost": 400,
        "dependsOn": ["t_chemistry"],
        "group": 7
    },
    {
        "ID": "t_flight",
        "cost": 450,
        "dependsOn": ["t_otto_engine","t_machine_gun"],
        "group": 8
    },
    {
        "ID": "t_nuclear_physics",
        "cost": 450,
        "dependsOn": ["t_nuclear_physics","t_fertilizers"],
        "group": 8
    },
    {
        "ID": "t_rockets",
        "cost": 500,
        "dependsOn": ["t_flight"],
        "group": 9
    },
    {
        "ID": "t_nuclear_bomb",
        "cost": 500,
        "dependsOn": ["t_flight","t_nuclear_physics"],
        "group": 9
    },
```

```
        },
        {
            "ID": "t_spacefaring",
            "cost": 550,
            "dependsOn": ["t_rockets"],
            "group": 10
        },
        {
            "ID": "t_computers",
            "cost": 550,
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```
            "dependsOn": ["t_rockets","t_nuclear_bomb"],
            "group": 10
        },
        {
            "ID": "t_reusable_rockets",
            "cost": 600,
            "dependsOn": ["t_spacefaring","t_computers"],
            "group": 11
        }
    ]
```

Texture atlases

```
"textureAtlases": [
    {
        "ID": "buildings",
        "cols": 7,
        "rows": 4,
        "textureId": "buildings"
    },
    {
        "ID": "roads",
        "cols": 8,
        "rows": 8,
        "textureId": "roads"
    },
    {
        "ID": "tiles",
        "cols": 12,
        "rows": 4,
        "textureId": "tiles"
    },
    {
        "ID": "units",
        "cols": 8,
        "rows": 5,
        "textureId": "units"
    },
    {
        "ID": "prod_icons",
        "cols": 3,
        "rows": 3,
        "textureId": "prod_icons"
    },
    {
        "ID": "notifications",
        "cols": 3,
```

```
        "rows": 2,
        "textureId": "notifications"
    },
    {
        "ID": "resources",
        "cols": 4,
        "rows": 2,
        "textureId": "resources"
    },
    {
        "ID": "tileresources",
        "cols": 5,
        "rows": 1,
        "textureId": "tileresources"
    },
    {
        "ID": "projectiles",
        "cols": 2,
        "rows": 2,
        "textureId": "projectiles"
    },
    {
        "ID": "ranks",
        "cols": 3,
        "rows": 1,
        "textureId": "ranks"
    },
    {
        "ID": "nuke",
        "cols": 3,
        "rows": 2,
        "textureId": "nuke"
    }
]
```

Resources

```
"resources": [
    {
        "ID": "r_food",
        "accumulate": true,
        "global": false,
        "textureAtlasId": "resources",
        "textureIndex": 1
    },
    {
        "ID": "r_production",
        "accumulate": false,
        "global": false,
        "textureAtlasId": "resources",
        "textureIndex": 5
    },
    {
        "ID": "r_science",
        "accumulate": false,
        "global": true,
        "textureAtlasId": "resources",
        "textureIndex": 6
    },
    {
        "ID": "r_gold",
        "accumulate": true,
        "global": true,
        "textureAtlasId": "resources",
        "textureIndex": 2
    },
```

```
    {
        "ID": "r_iron",
        "accumulate": true,
        "global": false,
        "textureAtlasId": "resources",
        "textureIndex": 3
    },
    {
        "ID": "r_uranium",
        "accumulate": true,
        "global": false,
        "textureAtlasId": "resources",
        "textureIndex": 7
    },
    {
        "ID": "r_coal",
        "accumulate": true,
        "global": false,
        "textureAtlasId": "resources",
        "textureIndex": 0
    },
    {
        "ID": "r_oil",
        "accumulate": true,
        "global": false,
        "textureAtlasId": "resources",
        "textureIndex": 4
    }
]
```

Projectiles

```
"projectiles": [
    {
        "ID": "p_arrow",
        "textureAtlasId": "projectiles",
        "textureIndex": 0
    },
    {
        "ID": "p_cannonball",
        "textureAtlasId": "projectiles",
        "textureIndex": 1
    },
```

```
    {
        "ID": "p_rocket",
        "textureAtlasId": "projectiles",
        "textureIndex": 2
    },
    {
        "ID": "p_stone",
        "textureAtlasId": "projectiles",
        "textureIndex": 3
    }
]
```

Tile resources

```
"tileResources": [
  {
    "ID": "tr_fish",
    "probability": 0.1,
    "techReq": "t_farming",
    "textureAtlasId": "tileresources",
    "textureIndex": 1,
    "tileType": "tt_ocean"
  },
  {
    "ID": "tr_iron",
    "probability": 0.3,
    "techReq": "t_mining",
    "textureAtlasId": "tileresources",
    "textureIndex": 2,
    "tileType": "tt_mountain"
  },
  {
    "ID": "tr_coal",
    "probability": 0.3,
    "techReq": "t_manufacturing",
    "textureAtlasId": "tileresources",
    "textureIndex": 0,
    "tileType": "tt_mountain"
  },
  {
    "ID": "tr_uranium",
    "probability": 0.2,
    "techReq": "t_nuclear_physics",
    "textureAtlasId": "tileresources",
    "textureIndex": 4,
    "tileType": "tt_hills"
  },
  {
    "ID": "tr_oil",
    "probability": 0.03,
    "techReq": "t_chemistry",
    "textureAtlasId": "tileresources",
    "textureIndex": 3,
    "tileType": "tt_ocean"
  }
]
```

Tile types

```
"tileTypes": [
  {
    "ID": "tt_grassland",
    "color": [40,200,100],
    "defenseBonus": 1.0
  },
  {
    "ID": "tt_pine_forest",
    "color": [30,150,70],
    "defenseBonus": 1.2
  },
  {
    "ID": "tt_ocean",
    "color": [130,220,255],
    "defenseBonus": 1.0
  },
  {
    "ID": "tt_deep_ocean",
    "color": [100,150,180],
    "defenseBonus": 1.0
  },
  {
    "ID": "tt_ice",
    "color": [200,255,255],
    "defenseBonus": 1.0
  },
  {
    "ID": "tt_mountain",
    "color": [240,240,240],
    "defenseBonus": 1.2
  },
  {
    "ID": "tt_snow",
    "color": [200,255,255],
    "defenseBonus": 1.0
  },
  {
    "ID": "tt_tundra",
    "color": [55,44,20],
    "defenseBonus": 1.0
  },
  {
    "ID": "tt_desert",
    "color": [240,200,50],
    "defenseBonus": 1.2
  },
  {
    "ID": "tt_forest",
    "color": [20,130,50],
    "defenseBonus": 1.2
  },
  {
    "ID": "tt_hills",
    "color": [50,180,90],
    "defenseBonus": 1.2
  },
  {
    "ID": "tt_icebergs",
    "color": [200,200,255],
    "defenseBonus": 1.0
  }
]
```

Locales

```
"locales": {
  "en": {
    "b_airfield_desc": "Home of planes.",
    "b_airfield_name": "airfield",
    "b_bank_desc": "",
    "b_bank_name": "bank",
    "b_barracks_desc": "Training place of soldiers.",
    "b_barracks_name": "barracks",
    "b_city_centre_desc": "Main building of the city.",
    "b_city_centre_name": "city centre",
    "b_coal_mine_desc": "",
    "b_coal_mine_name": "coal mine",
    "b_construction_desc": "Something is being built here.",
    "b_construction_name": "construction",
    "b_factory_desc": "Improved production source, building place of advanced mechanical units.",
    "b_factory_name": "factory",
    "b_farm_desc": "Primary food source.",
    "b_farm_ii_desc": "Improved farm.",
    "b_farm_ii_name": "farm II",
    "b_farm_name": "farm",
    "b_fishing_boats_desc": "Secondary food source.",
    "b_fishing_boats_name": "fishing boats",
    "b_granary_desc": "Boosts the population growth of the city.",
    "b_granary_name": "granary",
    "b_harbour_desc": "Building place of naval units.",
    "b_harbour_name": "harbour",
    "b_iron_mine_desc": "",
    "b_iron_mine_name": "iron mine",
    "b_launch_pad_desc": "Launching place of space rockets.",
    "b_launch_pad_name": "launch pad",
    "b_library_desc": "Primary source of science.",
    "b_library_name": "library",
    "b_lumbermill_desc": "Primary production source, building place of simple mechanical units.",
    "b_lumbermill_name": "lumbermill",
    "b_market_desc": "Provides gold.",
    "b_market_name": "market",
    "b_nuclear_plant_desc": "Improved source of production.",
    "b_nuclear_plant_name": "nuclear plant",
    "b_oil_platform_desc": "",
    "b_oil_platform_name": "oil platform",
    "b_plantation_desc": "Improved farm.",
    "b_plantation_name": "plantation",
    "b_research_lab_desc": "Improved source of science.",
    "b_research_lab_name": "research lab",
    "b_school_desc": "Improved source of science.",
    "b_school_name": "school",
    "b_stables_desc": "Training place of mounted units",
    "b_stables_name": "stables",
    "b_stock_exchange_desc": "Boosts the gold output of the city.",
    "b_stock_exchange_name": "stock exchange",
    "b_university_desc": "Boosts the science output of the city.",
    "b_university_name": "university",
    "b_uranium_mine_desc": "",
    "b_uranium_mine_name": "uranium mine",
    "c_aalborg": "Aalborg",
    "c_aarhus": "Aarhus",
    "c_ahmedabad": "Ahmedabad",
    "c_alexandria": "Alexandria",
    "c_antium": "Antium",
    "c_apollonia": "Apollonia",
    "c_aquincum": "Aquincum",
    "c_arbailu": "Arbailu",
    "c_argos": "Argos",
    "c_arrabona": "Arrabona",
    "c_arvaikheer": "Arvaikheer",
    "c_assur": "Assur",
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"c_aswan": "Aswan",
"c_asyut": "Asyut",
"c_athens": "Athens",
"c_baganuur": "Baganuur",
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"c_bayankhongor": "Bayankhongor",
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"c_berlin": "Berlin",
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"c_giza": "Giza",
"c_gorsium": "Gorsium",
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"c_guangzhou": "Guangzhou",
"c_halab": "Halab",
"c_hamburg": "Hamburg",
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"c_hanover": "Hanover",
"c_harran": "Harran",
"c_herculaneum": "Herculaneum",
"c_hyderabad": "Hyderabad",
"c_imgur-enlil": "Imgur-Enlil",
"c_jaipur": "Jaipur",
"c_jinan": "Jinan",
"c_kar-tukulti-ninurta": "Kar-Tukulti-Ninurta",
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"c_kyoto": "Kyoto",
"c_lesbos": "Lesbos",
"c_lucknow": "Lucknow",
"c_luxor": "Luxor",
"c_mansoura": "Mansoura",
"c_miletus": "Miletus",
"c_minya": "Minya",
"c_mumbai": "Mumbai",
"c_munich": "Munich",
"c_nagoya": "Nagoya",
"c_nalaikh": "Nalaikh",
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"c_niniveh": "Niniveh",
"c_odense": "Odense",
"c_osaka": "Osaka",
"c_oslo": "Oslo",
"c_ostia": "Ostia",
"c_patna": "Patna",
"c_pompeii": "Pompeii",
"c_qatna": "Qatna",
"c_reykjavik": "Reykjavik",
"c_rhodes": "Rhodes",
"c_rome": "Rome",
"c_sainshand": "Sainshand",
"c_saitama": "Saitama",
"c_sapporo": "Sapporo",
"c_sareisa": "Sareisa",
"c_sendai": "Sendai",
"c_shanghai": "Shanghai",
"c_shenzhen": "Shenzhen",
"c_sparta": "Sparta",
"c_stavanger": "Stavanger",
"c_stockholm": "Stockholm",
"c_stuttgart": "Stuttgart",
"c_suez": "Suez",
"c_surat": "Surat",
"c_tanta": "Tanta",
"c_thebes": "Thebes",
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"c_til_barsip": "Til Barsip",
"c_tokyo": "Tokyo",
"c_trondheim": "Trondheim",
"c_tsetserleg": "Tsetserleg",
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"c_ulaanbaatar": "Ulaanbaatar",
"c_ulaangom": "Ulaangom",
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"u_catapult_desc": "Basic sieging unit.",
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"u_chukonu_desc": "Unique Chinese ranged unit.",
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"u_crossbowman_desc": "Advanced ranged unit.",
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