

# Checkup all GSD

## 1 Boilerplate

## 2 Imports

### 2.1 prod: NVM

```
from nvm import disp_df
from nvm import repr_df
from nvm import rdf
from nvm import ddf
from nvm import clean_str
from nvm.aux_str import CLEAN_STR_MAPPINGS_LARGE as maps0
from nvm.aux_str import REGEX_ABC_DASH_XYZ_ASTERISK as re0
from nvm.aux_pandas import fix_column_names
```

### 2.2 prod: Basics

```
import os
import pathlib
import numpy as np
import pandas as pd
import re
import json
import yaml
import srsly
import uuid
import random
import numbers
from collections import OrderedDict
from contextlib import ExitStack
import warnings
# warnings.warn("\nwarning")
from hashlib import md5
import humanfriendly as hf
import time
import datetime as dt
from pytz import timezone as tz
```

```

tz0 = tz("Europe/Berlin")
from glob import glob
from tqdm import tqdm
import logging
log0.info("DONE: basic imports")

```

## 2.3 prod: Extra imports and settings

```

from contexttimer import Timer
import textwrap

HOME = pathlib.Path.home()

tqdm.pandas()

import matplotlib
from matplotlib import pyplot as plt
# import seaborn as sns
import plotly.graph_objects as go
import plotly.express as px

get_ipython().run_line_magic("matplotlib", "qt")
# get_ipython().run_line_magic("matplotlib", "inline")

with Timer() as elapsed:
    time.sleep(0.001)

log0.info(hf.format_timespan(elapsed.elapsed))

log0.info("DONE: extra imports and settings")

```

## 3 Extra Imports

### 3.1 prod: More extra imports and settings

```

log0.info("DONE: more extra imports and settings")

```

## 4 Process

### 4.1 prod: Load data

```

dir0 = "../../../data/u0005-qualtrics-results/test-002-init-10"
dir0 = "../../../data/u0005-qualtrics-results/test-003-init-45"
dir0 = "../../../data/u0005-qualtrics-results/test-004-init-90"
dir0 = pathlib.Path(dir0)
# dir0.mkdir(mode=0o700, parents=True, exist_ok=True)

```

```

assert dir0.exists(), f"The data directory dir0={str(dir0)} not found!"

name0 = f"GS_045_April+5,+2023_16.30.csv"
name0 = f"GS_045_April+5,+2023_19.55.csv"
name0 = f"GS_045_April+5,+2023_22.29.csv"

if0 = dir0/name0
log0.info(f"loading: {if0}...")
df1 = pd.read_csv(if0)
log0.info(f"loading: {if0}... DONE")

log0.info(f"{df1.shape = }")
disp_df(df1.sample(n=8).sort_index(), width=4444)

```

## 4.2 prod: Put column descriptions in a dictionary and drop obsolete rows from DF

```

# put first two rows to dictionary using column name as dictionary key
descr_rows = [0, 1]
dc0 = df1.loc[descr_rows, :].to_dict(orient="dict")
dc4 = {}
# improve column descriptions dictionary
for key0, val0 in dc0.items():
    # drop blank lines and copy value from subkey 0 to subkey 2
    dc0[key0][2] = "\n".join([line0.strip() for line0 in val0[0].split("\n") if line0.strip() != ""])
    # keep the first line only in subkey 0, for target questions this line contains wordnet ID
    dc0[key0][0] = val0[0].split("\n")[0]
    dc4[key0] = dc0[key0][2].split("\n")[-1]

# copy df without rows containing column descriptions
# NB: copy is used here only for the script development purpose,
# it should be dropped for production (TODO)
df2 = df1.drop(labels=descr_rows, axis=0).reset_index(drop=True).copy()

log0.info(f"{df2.shape = }")
df2 = df2[df2.Finished=="True"]
df2 = df2[df2.Progress=="100"]
df2 = df2[df2.PROLIFIC_PID.apply(lambda x: len(x) > 20)]
log0.info(f"{df2.shape = }")

# drop redundant variables
del descr_rows

log0.info("DONE")
log0.info(f"{df2.shape = }")
disp_df(df2.sample(n=8).sort_index(), width=4444)

```

### 4.3 Cols

```
for col0 in df2.columns:  
    print(f"    \"{col0}\",")
```

```
"StartDate",  
"EndDate",  
"Status",  
"IPAddress",  
"Progress",  
"Duration (in seconds)",  
"Finished",  
"RecordedDate",  
"ResponseId",  
"RecipientLastName",  
"RecipientFirstName",  
"RecipientEmail",  
"ExternalReference",  
"LocationLatitude",  
"LocationLongitude",  
"DistributionChannel",  
"UserLanguage",  
"Q_RecaptchaScore",  
"Q_RelevantIDDuplicate",  
"Q_RelevantIDDuplicateScore",  
"Q_RelevantIDFraudScore",  
"Q_RelevantIDLastStartDate",  
"q005_consent",  
"q006_prolificid",  
"q007_english",  
"train_q001",  
"train_q002",  
"train_q003",  
"train_q004",  
"train_q005",  
"train_q006",  
"train_q007",  
"train_q008",  
"train_q009",  
"MAIN_001",  
"MAIN_002",  
"MAIN_003",  
"MAIN_004",  
"MAIN_005",  
"MAIN_006",  
"MAIN_007",  
"MAIN_008",  
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```

"MAIN\_010",  
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"Q1\_ATTENTION\_n01",  
"q061\_gender",  
"q061\_gender\_3\_TEXT",  
"q062\_edu",  
"q062\_edu\_7\_TEXT",  
"q063\_age",  
"q064\_english",  
"final\_q001\_comments",

```
"final_q002_ID",  
"SC0",  
"PROLIFIC_PID",  
"score0",
```

## 4.4 Summaries

```
log0.info(f"{df2.shape = }")  
disp_df(df2.head(n=8).sort_index(), width=4444)
```

## 4.5 Check for missing and incomplete data

```
# q061_gender  
# q063_age  
df2.q063_age.value_counts(dropna=False)
```

## 4.6 Check NaNs

```
disp_df(df2[df2.final_q002_ID.isna()])
```

## 4.7 Drop incomplete cases

```
df3 = df2[~df2.final_q002_ID.isna()].copy()  
  
log0.info(f"{df3.shape = }")  
disp_df(df3.head(n=8).sort_index(), width=4444)
```

## 4.8 Age 2

```
# q061_gender  
# q063_age  
df3["q063_age"] = df3.q063_age.apply(int)  
  
log0.info(f"{df3.q063_age.mean()}")  
log0.info(f"{df3.q063_age.std()}")  
log0.info(f"{df3.q063_age.min()}")  
log0.info(f"{df3.q063_age.max()}")
```

## 4.9 Gender

```
df3.q061_gender.value_counts()
```

## 4.10 Prepare Data for the Long Format (MELT)

```
sent8 = sorted([col0 for col0 in df2.columns if col0.startswith("MAIN_")])
cols8 = ["PROLIFIC_PID"] + sent8
df8 = df2[cols8].copy()
map8 = {
    "very anti-agentic": -3,
    "anti-agentic": -2,
    "slightly anti-agentic": -1,
    "agency-neutral": 0,
    "slightly pro-agentic": 1,
    "pro-agentic": 2,
    "very pro-agentic": 3,
}
df8.replace(map8, inplace=True)
df8.rename("r{}".format, inplace=True)
df8[sent8].T.to_csv(dir0/"wide_trans_raw.csv", index=False)

log0.info(f"{df8.shape = }")
disp_df(df8, width=4444)
```

## 4.11 Long format (MELT)

```
df9 = pd.wide_to_long(df8, stubnames="MAIN_", i="PROLIFIC_PID", j="SENT", sep='_', suffix='\\d+').reset_index()
df9.dropna(inplace=True, subset="MAIN_")
df9.rename(columns={"MAIN_": "EVAL", "PROLIFIC_PID": "PID"}, inplace=True)

srsly.write_jsonl(dir0/"fact_PID.txt", sorted(df9["PID"].unique().tolist()))
srsly.write_jsonl(dir0/"fact_SENT.txt", sorted(df9["SENT"].unique().tolist()))
for if0 in dir0.glob("fact_*.txt"):
    # log0.info(f"proc: {if0}")
    with open(if0, "r") as fh: text8 = fh.read()
    text8 = text8.replace('\\', '')
    with open(if0, "w") as fh: fh.write(text8)

df9.to_csv(dir0/"long.csv", index=False)
log0.info(f"{df9.shape = }")
disp_df(df9, width=4444)
```

## 4.12 Save questions as well

```
srsly.write_json("../data/u0005-qualtrics-results/questions.json", dc4)
```

### 4.13 Check column descriptions

```
print(srsly.yaml_dumps(dc0))
```

### 4.14 Check column descriptions

```
print(srsly.yaml_dumps(dc4))
```

### 4.15 Check values

```
map2 = {  
    "very anti-agentic": -3,  
    "anti-agentic": -2,  
    "slightly anti-agentic": -1,  
    "agency-neutral": 0,  
    "slightly pro-agentic": 1,  
    "pro-agentic": 2,  
    "very pro-agentic": 3,  
}  
df2.replace(map2, inplace=True)  
df2.MAIN_218.value_counts()
```

### 4.16 Columns

```
cols2 = sorted([col2 for col2 in df2.columns if col2.startswith("MAIN_")])  
len(cols2)  
df3a = df2[cols2].describe().T  
df3b = df3a[["mean", "std", "min", "max"]].copy()  
df3b = df3b.sort_values(by="std")  
df3b.rename(index=dc4, inplace=True)  
disp_df(df3a, max_rows=444)
```

	count	mean	std	min	25%	50%	75%	max
MAIN_001	30.0	-0.866667	1.195778	-3.0	-2.00	-1.0	0.00	1.0
MAIN_002	29.0	-2.137931	0.953345	-3.0	-3.00	-2.0	-2.00	0.0
MAIN_003	30.0	-1.633333	1.325697	-3.0	-3.00	-2.0	-1.00	2.0
MAIN_004	31.0	-2.322581	0.652538	-3.0	-3.00	-2.0	-2.00	-1.0
MAIN_005	30.0	-2.133333	1.224276	-3.0	-3.00	-2.5	-2.00	2.0
MAIN_006	29.0	-0.551724	0.783135	-2.0	-1.00	0.0	0.00	0.0
MAIN_007	30.0	-1.166667	0.949894	-3.0	-2.00	-1.0	-1.00	2.0
MAIN_008	31.0	2.290323	0.642575	0.0	2.00	2.0	3.00	3.0
MAIN_009	29.0	-1.586207	0.779984	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_010	31.0	1.161290	0.734701	0.0	1.00	1.0	1.00	3.0
MAIN_011	30.0	2.333333	0.606478	1.0	2.00	2.0	3.00	3.0
MAIN_012	30.0	0.000000	0.371391	-1.0	0.00	0.0	0.00	1.0

MAIN_013	29.0	2.551724	0.685889	0.0	2.00	3.0	3.00	3.0
MAIN_014	31.0	-0.129032	1.454692	-3.0	-1.00	0.0	1.00	2.0
MAIN_015	31.0	-0.161290	1.067607	-2.0	-1.00	0.0	0.00	2.0
MAIN_016	30.0	-1.166667	1.205829	-3.0	-2.00	-1.0	0.00	1.0
MAIN_017	30.0	0.033333	0.182574	0.0	0.00	0.0	0.00	1.0
MAIN_018	31.0	0.096774	0.650889	-2.0	0.00	0.0	0.00	1.0
MAIN_019	31.0	2.645161	0.550659	1.0	2.00	3.0	3.00	3.0
MAIN_020	30.0	-2.166667	0.647719	-3.0	-3.00	-2.0	-2.00	-1.0
MAIN_021	31.0	2.483871	0.569852	1.0	2.00	3.0	3.00	3.0
MAIN_022	31.0	1.000000	0.816497	0.0	0.00	1.0	2.00	2.0
MAIN_023	30.0	2.066667	0.691492	0.0	2.00	2.0	2.00	3.0
MAIN_024	29.0	2.137931	0.580895	1.0	2.00	2.0	2.00	3.0
MAIN_025	29.0	2.655172	0.552647	1.0	2.00	3.0	3.00	3.0
MAIN_026	30.0	1.533333	1.008014	-1.0	1.00	1.5	2.00	3.0
MAIN_027	30.0	0.066667	0.449776	-1.0	0.00	0.0	0.00	2.0
MAIN_028	30.0	2.000000	0.909718	0.0	1.25	2.0	3.00	3.0
MAIN_029	30.0	2.266667	0.639684	1.0	2.00	2.0	3.00	3.0
MAIN_030	30.0	-1.200000	1.540264	-3.0	-2.00	-2.0	0.00	2.0
MAIN_031	30.0	2.200000	0.610257	1.0	2.00	2.0	3.00	3.0
MAIN_032	31.0	-1.935484	0.629046	-3.0	-2.00	-2.0	-2.00	-1.0
MAIN_033	29.0	-2.137931	0.639427	-3.0	-3.00	-2.0	-2.00	-1.0
MAIN_034	30.0	2.133333	0.628810	1.0	2.00	2.0	2.75	3.0
MAIN_035	30.0	2.600000	0.563242	1.0	2.00	3.0	3.00	3.0
MAIN_036	30.0	-1.266667	1.142693	-3.0	-2.00	-1.0	0.00	1.0
MAIN_037	29.0	0.551724	1.403725	-3.0	0.00	0.0	1.00	3.0
MAIN_038	30.0	1.966667	0.614948	1.0	2.00	2.0	2.00	3.0
MAIN_039	30.0	-2.466667	0.571346	-3.0	-3.00	-2.5	-2.00	-1.0
MAIN_040	30.0	-2.433333	0.727932	-3.0	-3.00	-3.0	-2.00	-1.0
MAIN_041	30.0	-0.733333	1.284747	-3.0	-2.00	-1.0	0.00	2.0
MAIN_042	29.0	0.206897	0.675030	-1.0	0.00	0.0	0.00	3.0
MAIN_043	30.0	-0.100000	0.803012	-2.0	0.00	0.0	0.00	2.0
MAIN_044	30.0	2.533333	0.507416	2.0	2.00	3.0	3.00	3.0
MAIN_045	29.0	1.034483	1.451176	-2.0	1.00	1.0	2.00	3.0
MAIN_046	30.0	2.800000	0.406838	2.0	3.00	3.0	3.00	3.0
MAIN_047	30.0	0.100000	0.402578	0.0	0.00	0.0	0.00	2.0
MAIN_048	30.0	0.600000	1.162637	-2.0	0.00	0.0	1.00	3.0
MAIN_049	31.0	-1.129032	1.258092	-3.0	-2.00	-1.0	0.00	2.0
MAIN_050	29.0	-1.103448	1.263352	-3.0	-2.00	-1.0	0.00	1.0
MAIN_051	30.0	-1.333333	0.802296	-3.0	-2.00	-1.0	-1.00	0.0
MAIN_052	29.0	2.103448	0.724314	0.0	2.00	2.0	3.00	3.0
MAIN_053	30.0	2.200000	0.714384	0.0	2.00	2.0	3.00	3.0
MAIN_054	31.0	-2.193548	0.980454	-3.0	-3.00	-2.0	-2.00	0.0
MAIN_055	31.0	-1.096774	1.164899	-3.0	-2.00	-1.0	0.00	0.0
MAIN_056	31.0	-2.419355	0.620440	-3.0	-3.00	-2.0	-2.00	-1.0
MAIN_057	31.0	-1.677419	1.399693	-3.0	-3.00	-2.0	-1.00	2.0
MAIN_058	29.0	0.034483	0.185695	0.0	0.00	0.0	0.00	1.0
MAIN_059	30.0	-2.166667	0.791478	-3.0	-3.00	-2.0	-2.00	0.0
MAIN_060	30.0	0.466667	0.628810	0.0	0.00	0.0	1.00	2.0
MAIN_061	29.0	1.379310	0.978840	0.0	1.00	1.0	2.00	3.0
MAIN_062	31.0	2.225806	0.844972	-1.0	2.00	2.0	3.00	3.0

MAIN_063	29.0	-1.758621	1.090713	-3.0	-2.00	-2.0	-2.00	2.0
MAIN_064	29.0	0.724138	1.031523	0.0	0.00	0.0	2.00	3.0
MAIN_065	30.0	-1.300000	0.876907	-3.0	-2.00	-1.0	-1.00	0.0
MAIN_066	30.0	-2.400000	0.621455	-3.0	-3.00	-2.0	-2.00	-1.0
MAIN_067	31.0	1.838710	0.778750	0.0	1.00	2.0	2.00	3.0
MAIN_068	31.0	0.645161	0.950382	-1.0	0.00	0.0	1.00	3.0
MAIN_069	30.0	-0.133333	1.041661	-3.0	-0.75	0.0	0.00	2.0
MAIN_070	30.0	-2.000000	0.787839	-3.0	-2.75	-2.0	-2.00	0.0
MAIN_071	30.0	-1.333333	1.347625	-3.0	-2.00	-1.5	-1.00	2.0
MAIN_072	30.0	0.433333	0.727932	0.0	0.00	0.0	1.00	2.0
MAIN_073	29.0	0.827586	0.928477	0.0	0.00	1.0	2.00	3.0
MAIN_074	30.0	2.066667	0.583292	1.0	2.00	2.0	2.00	3.0
MAIN_075	29.0	2.172414	0.928477	0.0	2.00	2.0	3.00	3.0
MAIN_076	30.0	1.466667	0.973204	0.0	1.00	1.0	2.00	3.0
MAIN_077	30.0	-0.800000	1.156690	-3.0	-1.00	-1.0	0.00	1.0
MAIN_078	29.0	-1.724138	0.921821	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_079	30.0	-0.033333	0.718395	-2.0	0.00	0.0	0.00	1.0
MAIN_080	30.0	0.700000	1.055364	-1.0	0.00	1.0	1.00	3.0
MAIN_081	30.0	0.400000	0.770132	0.0	0.00	0.0	0.75	3.0
MAIN_082	31.0	1.677419	0.944708	-1.0	1.00	2.0	2.00	3.0
MAIN_083	30.0	1.133333	1.041661	-1.0	1.00	1.0	2.00	3.0
MAIN_084	30.0	1.666667	1.268541	-2.0	1.00	2.0	2.75	3.0
MAIN_085	30.0	1.966667	0.614948	1.0	2.00	2.0	2.00	3.0
MAIN_086	29.0	0.586207	1.323341	-2.0	0.00	1.0	1.00	3.0
MAIN_087	30.0	1.733333	1.080655	-1.0	1.00	2.0	2.75	3.0
MAIN_088	29.0	-1.103448	1.175489	-3.0	-2.00	-1.0	-1.00	1.0
MAIN_089	31.0	-0.645161	1.018115	-3.0	-1.00	-1.0	0.00	1.0
MAIN_090	31.0	-0.774194	1.055452	-3.0	-1.00	-1.0	0.00	2.0
MAIN_091	30.0	-1.033333	1.066200	-3.0	-2.00	-1.0	0.00	1.0
MAIN_092	30.0	-1.800000	1.214851	-3.0	-3.00	-2.0	-1.00	1.0
MAIN_093	31.0	-2.483871	0.625618	-3.0	-3.00	-3.0	-2.00	-1.0
MAIN_094	31.0	1.612903	0.843699	0.0	1.00	2.0	2.00	3.0
MAIN_095	29.0	-2.000000	0.534522	-3.0	-2.00	-2.0	-2.00	-1.0
MAIN_096	31.0	-0.451613	1.120676	-3.0	-1.00	0.0	0.00	2.0
MAIN_097	30.0	-1.866667	0.776079	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_098	30.0	0.533333	1.008014	-2.0	0.00	0.0	1.00	3.0
MAIN_099	30.0	2.066667	0.827682	-1.0	2.00	2.0	2.75	3.0
MAIN_100	31.0	2.161290	0.934408	-1.0	2.00	2.0	3.00	3.0
MAIN_101	31.0	-0.161290	0.582911	-3.0	0.00	0.0	0.00	0.0
MAIN_102	30.0	-1.466667	1.502488	-3.0	-3.00	-1.5	-1.00	3.0
MAIN_103	30.0	2.200000	0.550861	1.0	2.00	2.0	2.75	3.0
MAIN_104	31.0	1.161290	1.293491	-2.0	1.00	1.0	2.00	3.0
MAIN_105	29.0	-1.862069	0.742781	-3.0	-2.00	-2.0	-2.00	0.0
MAIN_106	30.0	0.400000	0.563242	-1.0	0.00	0.0	1.00	1.0
MAIN_107	31.0	0.096774	0.396219	0.0	0.00	0.0	0.00	2.0
MAIN_108	30.0	2.300000	0.702213	0.0	2.00	2.0	3.00	3.0
MAIN_109	29.0	2.517241	1.153278	-3.0	2.00	3.0	3.00	3.0
MAIN_110	31.0	0.354839	0.550659	-1.0	0.00	0.0	1.00	1.0
MAIN_111	30.0	-0.333333	0.758098	-3.0	0.00	0.0	0.00	0.0
MAIN_112	30.0	-1.900000	0.994814	-3.0	-2.75	-2.0	-2.00	1.0

MAIN_113	31.0	1.774194	0.844972	0.0	1.00	2.0	2.00	3.0
MAIN_114	30.0	1.066667	0.907187	-1.0	0.25	1.0	2.00	3.0
MAIN_115	31.0	1.709677	0.937854	-1.0	1.00	2.0	2.00	3.0
MAIN_116	30.0	-0.400000	0.968468	-3.0	-0.75	0.0	0.00	2.0
MAIN_117	31.0	1.290323	1.243478	-2.0	1.00	2.0	2.00	3.0
MAIN_118	30.0	1.233333	1.040004	0.0	0.00	1.0	2.00	3.0
MAIN_119	29.0	1.896552	0.724314	0.0	2.00	2.0	2.00	3.0
MAIN_120	29.0	0.275862	1.250616	-2.0	0.00	0.0	1.00	3.0
MAIN_121	31.0	-0.967742	1.048296	-3.0	-2.00	-1.0	0.00	0.0
MAIN_122	30.0	-0.100000	0.884736	-3.0	0.00	0.0	0.00	3.0
MAIN_123	30.0	0.233333	0.858360	-2.0	0.00	0.0	0.00	3.0
MAIN_124	30.0	-1.566667	1.040004	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_125	30.0	-0.533333	0.776079	-3.0	-1.00	0.0	0.00	1.0
MAIN_126	30.0	1.133333	0.899553	-1.0	1.00	1.0	2.00	3.0
MAIN_127	29.0	0.827586	0.928477	0.0	0.00	1.0	1.00	3.0
MAIN_128	30.0	1.866667	0.860366	0.0	1.00	2.0	2.00	3.0
MAIN_129	30.0	-0.800000	0.996546	-3.0	-1.75	0.0	0.00	0.0
MAIN_130	30.0	-2.100000	0.803012	-3.0	-3.00	-2.0	-2.00	0.0
MAIN_131	30.0	0.666667	0.958927	0.0	0.00	0.0	1.00	3.0
MAIN_132	30.0	1.133333	1.195778	-2.0	0.25	1.0	2.00	3.0
MAIN_133	30.0	1.966667	0.964305	-2.0	2.00	2.0	2.00	3.0
MAIN_134	29.0	-1.655172	1.232763	-3.0	-3.00	-2.0	-1.00	1.0
MAIN_135	30.0	0.066667	0.365148	-1.0	0.00	0.0	0.00	1.0
MAIN_136	30.0	-0.333333	0.758098	-3.0	-0.75	0.0	0.00	1.0
MAIN_137	30.0	2.133333	1.074255	-1.0	2.00	2.0	3.00	3.0
MAIN_138	29.0	1.586207	1.210585	-2.0	1.00	2.0	2.00	3.0
MAIN_139	30.0	-2.533333	0.730297	-3.0	-3.00	-3.0	-2.00	0.0
MAIN_140	30.0	0.066667	1.337350	-3.0	0.00	0.0	1.00	3.0
MAIN_141	30.0	-2.366667	0.764890	-3.0	-3.00	-2.5	-2.00	0.0
MAIN_142	30.0	-1.700000	1.055364	-3.0	-2.75	-2.0	-1.00	0.0
MAIN_143	29.0	2.517241	0.574499	1.0	2.00	3.0	3.00	3.0
MAIN_144	30.0	0.566667	0.935261	-2.0	0.00	0.0	1.00	3.0
MAIN_145	30.0	0.433333	1.135124	-2.0	0.00	1.0	1.00	2.0
MAIN_146	29.0	1.413793	1.052794	0.0	0.00	2.0	2.00	3.0
MAIN_147	30.0	2.366667	0.850287	0.0	2.00	3.0	3.00	3.0
MAIN_148	31.0	-1.516129	1.313290	-3.0	-2.00	-2.0	-1.00	2.0
MAIN_149	29.0	1.862069	0.639427	1.0	1.00	2.0	2.00	3.0
MAIN_150	31.0	-0.161290	0.373878	-1.0	0.00	0.0	0.00	0.0
MAIN_151	30.0	2.033333	0.850287	0.0	2.00	2.0	3.00	3.0
MAIN_152	29.0	0.068966	0.257881	0.0	0.00	0.0	0.00	1.0
MAIN_153	31.0	-0.419355	1.204829	-3.0	-1.00	0.0	0.00	3.0
MAIN_154	31.0	0.677419	1.012821	-2.0	0.00	0.0	1.00	3.0
MAIN_155	30.0	-0.366667	1.033352	-3.0	-0.75	0.0	0.00	2.0
MAIN_156	31.0	1.903226	0.789719	0.0	2.00	2.0	2.00	3.0
MAIN_157	30.0	1.666667	1.061337	-3.0	1.00	2.0	2.00	3.0
MAIN_158	29.0	0.241379	0.576639	0.0	0.00	0.0	0.00	2.0
MAIN_159	30.0	-0.433333	1.590561	-3.0	-2.00	-1.0	1.00	3.0
MAIN_160	29.0	1.655172	0.856732	-1.0	1.00	2.0	2.00	3.0
MAIN_161	30.0	1.100000	1.093870	-2.0	1.00	1.0	2.00	3.0
MAIN_162	31.0	-1.741935	0.998924	-3.0	-2.00	-2.0	-1.00	1.0



MAIN_163	30.0	2.233333	0.773854	0.0	2.00	2.0	3.00	3.0
MAIN_164	29.0	0.310345	0.603765	0.0	0.00	0.0	0.00	2.0
MAIN_165	31.0	0.935484	1.062559	0.0	0.00	1.0	2.00	3.0
MAIN_166	30.0	-1.700000	0.952311	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_167	30.0	1.900000	0.959526	-1.0	1.25	2.0	2.75	3.0
MAIN_168	31.0	0.419355	0.672022	0.0	0.00	0.0	1.00	2.0
MAIN_169	31.0	-0.741935	1.094463	-3.0	-1.50	0.0	0.00	1.0
MAIN_170	31.0	-1.870968	0.957146	-3.0	-3.00	-2.0	-1.00	1.0
MAIN_171	31.0	-0.580645	1.088552	-3.0	-1.00	0.0	0.00	2.0
MAIN_172	30.0	-1.666667	0.922266	-3.0	-2.00	-2.0	-1.00	1.0
MAIN_173	30.0	2.266667	0.691492	1.0	2.00	2.0	3.00	3.0
MAIN_174	30.0	-2.033333	0.764890	-3.0	-2.75	-2.0	-2.00	0.0
MAIN_175	30.0	0.433333	0.727932	0.0	0.00	0.0	1.00	2.0
MAIN_176	31.0	-0.677419	0.908739	-3.0	-1.00	-1.0	0.00	1.0
MAIN_177	31.0	2.387097	0.615219	1.0	2.00	2.0	3.00	3.0
MAIN_178	30.0	0.000000	0.000000	0.0	0.00	0.0	0.00	0.0
MAIN_179	29.0	2.310345	0.712313	1.0	2.00	2.0	3.00	3.0
MAIN_180	30.0	-2.033333	0.718395	-3.0	-2.75	-2.0	-2.00	-1.0
MAIN_181	30.0	1.700000	1.764594	-3.0	2.00	2.0	3.00	3.0
MAIN_182	31.0	-0.225806	0.762001	-2.0	-1.00	0.0	0.00	1.0
MAIN_183	30.0	-0.900000	1.322224	-3.0	-2.00	-0.5	0.00	2.0
MAIN_184	30.0	-0.633333	1.245221	-3.0	-1.00	-1.0	0.00	2.0
MAIN_185	29.0	-0.172414	1.489702	-3.0	-1.00	0.0	1.00	3.0
MAIN_186	30.0	1.233333	1.165106	-3.0	1.00	1.5	2.00	3.0
MAIN_187	31.0	-1.322581	0.979357	-3.0	-2.00	-1.0	-1.00	0.0
MAIN_188	30.0	-0.600000	1.069966	-3.0	-1.00	0.0	0.00	1.0
MAIN_189	29.0	-1.689655	1.490528	-3.0	-3.00	-2.0	-1.00	3.0
MAIN_190	30.0	-1.166667	1.341212	-3.0	-2.00	-2.0	-1.00	1.0
MAIN_191	29.0	-1.379310	1.082781	-3.0	-2.00	-1.0	-1.00	2.0
MAIN_192	30.0	1.900000	0.661764	1.0	1.25	2.0	2.00	3.0
MAIN_193	30.0	0.166667	1.510500	-3.0	-1.00	1.0	1.00	2.0
MAIN_194	30.0	-0.266667	1.387961	-3.0	-1.00	-0.5	1.00	3.0
MAIN_195	29.0	1.551724	1.088453	-1.0	1.00	2.0	2.00	3.0
MAIN_196	30.0	-1.100000	1.124952	-2.0	-2.00	-1.0	-1.00	2.0
MAIN_197	29.0	0.172414	1.712746	-3.0	-1.00	1.0	2.00	3.0
MAIN_198	29.0	-0.517241	1.271127	-3.0	-1.00	0.0	0.00	2.0
MAIN_199	31.0	-0.387097	1.520470	-3.0	-2.00	-1.0	1.00	3.0
MAIN_200	29.0	-1.689655	0.712313	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_201	30.0	-1.866667	0.860366	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_202	30.0	-2.300000	0.651259	-3.0	-3.00	-2.0	-2.00	0.0
MAIN_203	31.0	-0.064516	0.359211	-2.0	0.00	0.0	0.00	0.0
MAIN_204	30.0	-2.033333	0.668675	-3.0	-2.00	-2.0	-2.00	-1.0
MAIN_205	31.0	1.322581	0.871286	0.0	1.00	2.0	2.00	3.0
MAIN_206	30.0	0.266667	1.484014	-3.0	-1.00	0.0	2.00	2.0
MAIN_207	30.0	1.500000	0.731083	0.0	1.00	2.0	2.00	3.0
MAIN_208	30.0	2.200000	0.761124	1.0	2.00	2.0	3.00	3.0
MAIN_209	30.0	2.000000	0.946864	0.0	2.00	2.0	3.00	3.0
MAIN_210	29.0	-1.827586	0.804850	-3.0	-2.00	-2.0	-2.00	0.0
MAIN_211	30.0	0.000000	0.000000	0.0	0.00	0.0	0.00	0.0
MAIN_212	29.0	-0.965517	0.865314	-3.0	-2.00	-1.0	0.00	0.0

MAIN_213	30.0	-0.833333	1.147211	-3.0	-2.00	-0.5	0.00	1.0
MAIN_214	31.0	0.322581	1.076634	-2.0	0.00	1.0	1.00	2.0
MAIN_215	30.0	-0.966667	1.188547	-3.0	-1.75	-1.0	0.00	1.0
MAIN_216	31.0	-2.129032	0.763411	-3.0	-3.00	-2.0	-2.00	-1.0
MAIN_217	30.0	-0.033333	0.413841	-2.0	0.00	0.0	0.00	1.0
MAIN_218	30.0	-1.200000	0.886683	-3.0	-2.00	-1.0	-1.00	0.0
MAIN_219	30.0	-0.800000	1.323527	-3.0	-2.00	-1.0	0.00	1.0
MAIN_220	29.0	1.689655	1.072495	0.0	1.00	2.0	3.00	3.0
MAIN_221	30.0	-0.033333	0.556053	-2.0	0.00	0.0	0.00	1.0
MAIN_222	30.0	-1.600000	0.621455	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_223	29.0	1.344828	1.369981	-2.0	1.00	2.0	2.00	3.0
MAIN_224	30.0	-1.133333	1.795268	-3.0	-3.00	-1.5	0.00	3.0
MAIN_225	30.0	-1.900000	0.607425	-3.0	-2.00	-2.0	-2.00	-1.0
MAIN_226	31.0	-1.838710	1.035914	-3.0	-3.00	-2.0	-1.00	0.0
MAIN_227	30.0	2.266667	1.201532	-3.0	2.00	2.5	3.00	3.0
MAIN_228	30.0	-0.966667	1.325697	-3.0	-2.00	-1.0	0.00	3.0
MAIN_229	29.0	-0.689655	0.849514	-2.0	-1.00	-1.0	0.00	1.0
MAIN_230	30.0	-2.466667	0.571346	-3.0	-3.00	-2.5	-2.00	-1.0
MAIN_231	29.0	-2.482759	0.508548	-3.0	-3.00	-2.0	-2.00	-2.0
MAIN_232	30.0	-2.366667	0.718395	-3.0	-3.00	-2.0	-2.00	0.0
MAIN_233	31.0	0.193548	0.601074	-1.0	0.00	0.0	0.00	2.0
MAIN_234	30.0	0.100000	0.607425	-1.0	0.00	0.0	0.00	2.0
MAIN_235	30.0	0.000000	0.587220	-2.0	0.00	0.0	0.00	2.0
MAIN_236	29.0	2.103448	0.673203	1.0	2.00	2.0	3.00	3.0
MAIN_237	30.0	-1.700000	0.987857	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_238	29.0	2.103448	0.816999	0.0	2.00	2.0	3.00	3.0
MAIN_239	30.0	-0.033333	0.319842	-1.0	0.00	0.0	0.00	1.0
MAIN_240	30.0	2.100000	0.758856	0.0	2.00	2.0	3.00	3.0
MAIN_241	30.0	2.133333	0.776079	0.0	2.00	2.0	3.00	3.0
MAIN_242	31.0	0.774194	0.804557	-1.0	0.00	1.0	1.00	2.0
MAIN_243	31.0	2.322581	0.599283	1.0	2.00	2.0	3.00	3.0
MAIN_244	31.0	0.032258	0.179605	0.0	0.00	0.0	0.00	1.0
MAIN_245	30.0	-2.466667	0.973204	-3.0	-3.00	-3.0	-2.00	1.0
MAIN_246	29.0	-0.379310	1.521601	-3.0	-1.00	-1.0	1.00	2.0
MAIN_247	29.0	1.379310	1.656455	-3.0	1.00	2.0	3.00	3.0
MAIN_248	29.0	2.137931	0.639427	1.0	2.00	2.0	3.00	3.0
MAIN_249	30.0	1.333333	1.241060	-1.0	0.25	2.0	2.00	3.0
MAIN_250	30.0	0.066667	0.365148	0.0	0.00	0.0	0.00	2.0
MAIN_251	30.0	-0.900000	1.295882	-3.0	-2.00	-1.0	0.00	2.0
MAIN_252	30.0	2.600000	0.498273	2.0	2.00	3.0	3.00	3.0
MAIN_253	31.0	1.096774	1.044185	-1.0	0.00	1.0	2.00	3.0
MAIN_254	30.0	1.466667	0.819307	0.0	1.00	2.0	2.00	3.0
MAIN_255	30.0	-2.366667	0.718395	-3.0	-3.00	-2.5	-2.00	-1.0
MAIN_256	30.0	-1.733333	1.142693	-3.0	-2.00	-2.0	-1.00	1.0
MAIN_257	30.0	2.000000	0.694808	1.0	2.00	2.0	2.00	3.0
MAIN_258	29.0	0.000000	0.000000	0.0	0.00	0.0	0.00	0.0
MAIN_259	30.0	1.133333	1.136642	0.0	0.00	1.0	2.00	3.0
MAIN_260	29.0	-0.758621	1.902164	-3.0	-2.00	-1.0	1.00	3.0
MAIN_261	29.0	-0.241379	1.327058	-3.0	-1.00	0.0	1.00	2.0
MAIN_262	29.0	2.172414	0.539111	1.0	2.00	2.0	2.00	3.0

MAIN_263	29.0	1.206897	0.940338	0.0	0.00	1.0	2.00	3.0
MAIN_264	30.0	0.400000	0.813676	-1.0	0.00	0.0	1.00	3.0
MAIN_265	29.0	2.379310	0.561490	1.0	2.00	2.0	3.00	3.0
MAIN_266	30.0	-0.433333	1.165106	-2.0	-1.00	-1.0	1.00	2.0
MAIN_267	29.0	-0.448276	1.212618	-3.0	-1.00	0.0	0.00	2.0
MAIN_268	29.0	1.379310	0.978840	0.0	1.00	1.0	2.00	3.0
MAIN_269	30.0	0.733333	0.868345	0.0	0.00	0.5	1.00	3.0
MAIN_270	30.0	-0.466667	1.252125	-3.0	-1.00	0.0	0.00	2.0
MAIN_271	30.0	-0.366667	0.850287	-3.0	0.00	0.0	0.00	1.0
MAIN_272	30.0	-0.633333	1.098065	-3.0	-1.00	0.0	0.00	2.0
MAIN_273	31.0	-0.419355	0.672022	-2.0	-1.00	0.0	0.00	0.0
MAIN_274	30.0	-0.433333	1.430778	-3.0	-1.00	0.0	0.00	3.0
MAIN_275	30.0	1.566667	0.897634	-1.0	1.00	2.0	2.00	3.0
MAIN_276	30.0	2.733333	0.449776	2.0	2.25	3.0	3.00	3.0
MAIN_277	30.0	2.133333	0.681445	1.0	2.00	2.0	3.00	3.0
MAIN_278	29.0	-2.206897	0.901559	-3.0	-3.00	-2.0	-2.00	1.0
MAIN_279	30.0	2.233333	0.727932	1.0	2.00	2.0	3.00	3.0
MAIN_280	31.0	1.516129	0.889605	0.0	1.00	2.0	2.00	3.0
MAIN_281	31.0	0.580645	0.958269	0.0	0.00	0.0	1.00	3.0
MAIN_282	30.0	-0.300000	0.702213	-2.0	0.00	0.0	0.00	1.0
MAIN_283	30.0	1.733333	0.739680	0.0	1.00	2.0	2.00	3.0
MAIN_284	31.0	-1.967742	0.836017	-3.0	-3.00	-2.0	-1.00	0.0
MAIN_285	31.0	-1.451613	1.337627	-3.0	-2.00	-2.0	-1.00	2.0
MAIN_286	30.0	1.166667	0.912871	-1.0	1.00	1.0	2.00	3.0
MAIN_287	30.0	0.866667	0.860366	0.0	0.00	1.0	2.00	2.0
MAIN_288	29.0	-2.172414	0.889180	-3.0	-3.00	-2.0	-2.00	0.0
MAIN_289	30.0	-2.000000	0.830455	-3.0	-3.00	-2.0	-1.00	-1.0
MAIN_290	31.0	2.354839	0.660726	1.0	2.00	2.0	3.00	3.0
MAIN_291	30.0	-1.833333	0.912871	-3.0	-2.00	-2.0	-1.00	0.0
MAIN_292	30.0	0.400000	0.770132	-2.0	0.00	0.0	1.00	2.0
MAIN_293	31.0	0.161290	0.860108	-2.0	0.00	0.0	1.00	2.0
MAIN_294	30.0	1.866667	1.136642	-1.0	1.00	2.0	3.00	3.0
MAIN_295	30.0	2.066667	0.739680	1.0	2.00	2.0	3.00	3.0
MAIN_296	30.0	1.133333	0.973204	0.0	0.00	1.0	2.00	3.0
MAIN_297	29.0	-2.034483	0.778403	-3.0	-3.00	-2.0	-1.00	-1.0
MAIN_298	30.0	-2.333333	0.660895	-3.0	-3.00	-2.0	-2.00	-1.0
MAIN_299	30.0	-2.133333	0.730297	-3.0	-3.00	-2.0	-2.00	0.0
MAIN_300	30.0	-2.233333	1.304722	-3.0	-3.00	-3.0	-2.00	3.0

## 4.17 Heatmap

```
fig = go.Figure(data=go.Heatmap(
    z=df3b,
    x=df3b.columns,
    y=df3b.index,
    # colorscale=corr_colors0,
    text=df3b.to_numpy(),
    texttemplate="%{text:.2f}",
    textfont={"size":11},
```

```

        zmin=-3,
        zmid=0,
        zmax=3,
    ))

fig.update_yaxes(autorange="reversed")
fig.update_xaxes(side="top")
fig.write_html("fig_002_ratings.html")

```

## 4.18 Heatmap from pandas

```

import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from matplotlib import colors

cm = sns.diverging_palette(5, 250, as_cmap=True)

def background_gradient(s, m, M, cmap='PuBu', low=0, high=0):
    rng = M - m
    norm = colors.Normalize(m - (rng * low),
                             M + (rng * high))
    normed = norm(s.values)
    c = [colors.rgb2hex(x) for x in plt.cm.get_cmap(cmap)(normed)]
    return ['background-color: %s' % color for color in c]

even_range = np.max([np.abs(df3b.values.min()), np.abs(df3b.values.max())])

df3b_str = df3b.style.apply(
    background_gradient,
    cmap=cm,
    m=-even_range,
    M=even_range,
).set_precision(2).render()
# this method is deprecated in favour of `Styler.format(precision=..)`
# this method is deprecated in favour of `Styler.to_html()`

log0.info(f"{type(df3b_str) = }")
log0.info(f"{len(df3b_str) = }")

of0 = "fig_004_test.html"
with open(of0, "w") as fh:
    fh.write(df3b_str)

```

## 5 Check agreement

### 5.1 Select data

```
df4 = df2[cols2].T
log0.info(f"{df4.shape = }")
disp_df(df4)
```

I: df4.shape = (300, 96)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MAIN_001	-2.0	NaN	NaN	NaN	NaN	NaN	-2.0	0.0	NaN	NaN	0.0	NaN	NaN	0.0	NaN	NaN
MAIN_002	NaN	-2.0	-3.0	NaN	NaN	NaN	NaN	NaN	-2.0	NaN	NaN	NaN	NaN	-2.0	NaN	NaN
MAIN_003	NaN	NaN	NaN	NaN	1.0	-1.0	NaN	-1.0	NaN	-1.0	2.0	NaN	NaN	NaN	NaN	-2.0
MAIN_004	-2.0	NaN	NaN	NaN	NaN	NaN	-1.0	-2.0	NaN	NaN	NaN	NaN	NaN	-2.0	NaN	-2.0
MAIN_005	NaN	NaN	NaN	-2.0	-2.0	-1.0	NaN	NaN	NaN	-3.0	NaN	NaN	NaN	NaN	NaN	-2.0
MAIN_006	NaN	NaN	-2.0	NaN	-1.0	NaN	NaN	NaN	-1.0	NaN	0.0	NaN	NaN	-2.0	NaN	-1.0
MAIN_007	NaN	-1.0	-1.0	-1.0	NaN	NaN	NaN	NaN	NaN	2.0	NaN	NaN	NaN	NaN	-1.0	NaN
MAIN_008	2.0	NaN	2.0	2.0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	3.0	NaN	NaN	2.0
MAIN_009	NaN	NaN	NaN	0.0	-1.0	-2.0	NaN	NaN	NaN	0.0	-2.0	NaN	NaN	NaN	NaN	NaN
MAIN_010	NaN	NaN	NaN	NaN	1.0	NaN	1.0	1.0	NaN	NaN	NaN	NaN	NaN	0.0	NaN	1.0
MAIN_011	NaN	NaN	NaN	1.0	1.0	2.0	NaN	NaN	NaN	NaN	NaN	NaN	2.0	NaN	NaN	2.0
MAIN_012	NaN	0.0	0.0	NaN	NaN	NaN	NaN	NaN	0.0	0.0	NaN	NaN	NaN	NaN	NaN	NaN
MAIN_013	2.0	NaN	NaN	3.0	NaN	2.0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	2.0	NaN	2.0
MAIN_014	-2.0	NaN	1.0	2.0	NaN	NaN	NaN	NaN	NaN	NaN	2.0	NaN	1.0	NaN	NaN	NaN
MAIN_015	2.0	NaN	-1.0	0.0	NaN	NaN	NaN	NaN	NaN	NaN	-1.0	NaN	0.0	NaN	NaN	NaN
MAIN_016	NaN	-1.0	NaN	NaN	NaN	-2.0	NaN	1.0	NaN	NaN	NaN	NaN	-1.0	NaN	-2.0	NaN
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
MAIN_285	NaN	NaN	NaN	NaN	-2.0	-1.0	NaN	-2.0	NaN	NaN	2.0	NaN	-1.0	NaN	NaN	NaN
MAIN_286	NaN	NaN	2.0	NaN	1.0	NaN	NaN	1.0	NaN	0.0	2.0	NaN	NaN	NaN	NaN	NaN
MAIN_287	2.0	NaN	2.0	NaN	NaN	NaN	NaN	NaN	2.0	0.0	0.0	NaN	NaN	NaN	NaN	NaN
MAIN_288	NaN	-2.0	NaN	NaN	NaN	-2.0	NaN	NaN	-3.0	NaN	-2.0	NaN	NaN	-2.0	NaN	NaN
MAIN_289	NaN	NaN	NaN	-1.0	-1.0	-1.0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	-2.0	-2.0	NaN
MAIN_290	NaN	NaN	NaN	NaN	2.0	2.0	NaN	2.0	NaN	NaN	3.0	NaN	2.0	NaN	NaN	2.0
MAIN_291	-2.0	NaN	NaN	NaN	NaN	-1.0	NaN	NaN	-2.0	-3.0	NaN	NaN	NaN	NaN	NaN	-2.0
MAIN_292	2.0	NaN	NaN	1.0	NaN	0.0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	0.0	-2.0	1.0
MAIN_293	2.0	NaN	NaN	0.0	NaN	NaN	1.0	NaN	NaN	NaN	NaN	NaN	NaN	-1.0	0.0	0.0
MAIN_294	NaN	2.0	2.0	NaN	NaN	NaN	NaN	NaN	3.0	0.0	NaN	NaN	NaN	NaN	3.0	1.0
MAIN_295	NaN	2.0	2.0	NaN	NaN	NaN	NaN	NaN	3.0	2.0	NaN	NaN	NaN	NaN	1.0	1.0
MAIN_296	2.0	NaN	NaN	NaN	NaN	NaN	2.0	NaN	1.0	NaN	NaN	NaN	0.0	NaN	0.0	NaN
MAIN_297	NaN	-1.0	-2.0	-1.0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	-2.0	NaN	NaN
MAIN_298	-2.0	NaN	NaN	NaN	NaN	-1.0	NaN	NaN	-3.0	NaN	NaN	NaN	NaN	-1.0	NaN	NaN
MAIN_299	NaN	NaN	NaN	-2.0	-2.0	-3.0	NaN	NaN	NaN	-3.0	NaN	NaN	NaN	NaN	-1.0	NaN
MAIN_300	NaN	NaN	-2.0	NaN	-2.0	NaN	NaN	NaN	-2.0	NaN	NaN	NaN	NaN	-2.0	-2.0	NaN

[300 rows x 96 columns]