Analysis

Niclas Dobbertin

October 23, 2023

Contents

1 Imports

```
import pandas as pd
import pickle
from pathlib import Path
```

2 Constants

```
data_path = Path("/home/niclas/repos/uni/master_thesis/experiment/data")

procedures = ["1", "2", "3", "4", "5", "6", "overall"]
```

3 Import Data

```
def unpickle(pkl):
```

```
    with open(pkl, "rb") as f:
        data = pickle.load(f)
    return data
```

3.1 Conditions

```
conditions = [x.stem for x in data_path.iterdir() if x.is_dir()]
conditions
```

random   fixed   blocked

3.2 Data

```
data = {}
for condition in conditions:
    data[condition] = {}
    for vp in (data_path / condition).iterdir():
        data[condition][vp.stem] = unpickle(vp / "vp.pkl")
```

```
None
```

4 Basic statistics

4.1 Total percent correct

To find out how well VP solved the tasked, we calculate the accuracy for train and test phase.

```
def percent_correct(vp):
    train = [x for x in vp.keys() if "train" in x]
    test = [x for x in vp.keys() if "test" in x]

    train_total = len(train) * len(vp[train[0]]["procedure_order"])
    test_total = len(test) * len(vp[test[0]]["procedure_order"])

    train_correct = 0
    test_correct = 0

    def count_correct(trials):
        trials_correct = 0
        for sample in trials:
```

```
            for proc in vp[sample]["procedure_order"]:
                vp_ans = vp[sample][proc]["answer"]
                for c in vp_ans:
                    if not c.isdigit():
                        vp_ans = vp_ans.replace(c, "")
                vp_ans = int(vp_ans)
                if vp_ans == vp[sample]["water_sample"][proc][0]:
                    trials_correct += 1
        return trials_correct

    return count_correct(train) / train_total, count_correct(test) / test_total

condition = "random"
df = pd.DataFrame([percent_correct(data[condition][vp]) for vp in data[condition].keys
df
```

```
       train       test
0   0.822222   0.820000
1   0.966667   0.800000
2   0.973333   0.980000
3   0.911111   0.960000
4   0.906667   0.980000
5   0.924444   0.943333
6   0.957778   0.926667
7   0.857778   0.946667
8   0.962222   0.970000
9   0.982222   0.986667
```

Most subjects have an accuracy of over 95% in both training and test phase. Some however are notably lower, under 90% in either training or test phase, or both. This could be a systematic misunderstanding of specific equations, that are present in both, or only one of the two phases. To investigate, we look at the per procedure accuracy per subject.

```
pass
```

```
None
```