

08

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1 Day 8: Handheld Halting

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- <https://adventofcode.com/2020/day/8>

1.1 Setup

```
[1]: import pandas as pd
import re

[2]: with open("inputs/08-input.txt") as f:
    raw = f.read().splitlines()

[3]: # separate and convert operations to numbers
instructions = [item.split(" ") for item in raw]
instructions = [[item[0], int(item[1])] for item in instructions]

[4]: instructions[:5]

[4]: [['acc', -5], ['nop', 333], ['acc', 45], ['jmp', 288], ['acc', -9]]
```

1.2 Part 1

```
[5]: # run infinite loop, stop when double back to visited instruction
def run_the_loop(instructions):
    line = 0
    accumulator = 0
    visited = []

    # loop through instructions
    while line not in visited:

        # define values
        operation = instructions[line][0]
        argument = instructions[line][1]
```

```

    # mark this line as visited
    visited.append(line)

    # if at end, break (part 2)
    if line == len(instructions) - 1:
        break

    # respond to new instructions

    if operation == 'acc':
        accumulator += argument
        line += 1

    if operation == 'jmp':
        line += argument

    if operation == 'nop':
        line += 1

    return {"last_line": line,
            "accumulator": accumulator}

```

```
[6]: run_the_loop(instructions)
```

```
[6]: {'last_line': 439, 'accumulator': 1709}
```

1.3 Part 2

```
[7]: desired_end_index = len(instructions) - 1
```

```
[8]: # swap 'nop' and 'jmp', run new instructions
    for ind, item in enumerate(instructions):

        modified = instructions.copy()
        operation = item[0]
        argument = item[1]

        if operation != 'acc':

            if operation == 'jmp':
                modified[ind] = ['nop', argument]
            elif operation == 'nop':
                modified[ind] = ['jmp', argument]

        # run on new instructions
        results = run_the_loop(modified)

        # if the loop ends at the last line, print it out

```

```
if results['last_line'] == desired_end_index:  
    print(results)
```

```
{'last_line': 616, 'accumulator': 1976}
```