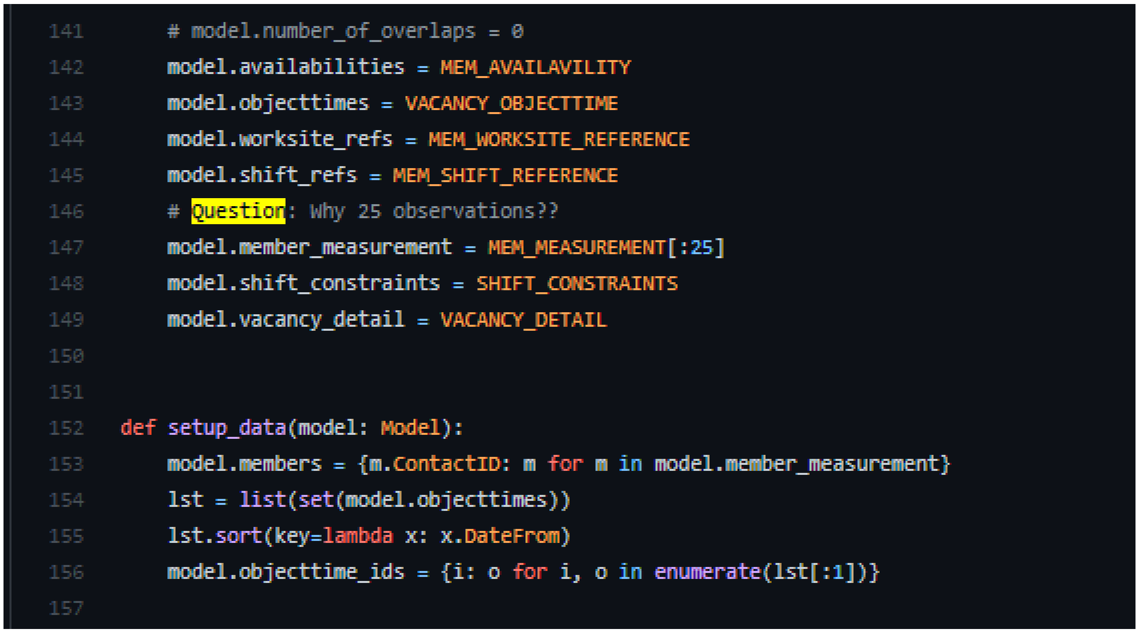
1. Question-1

`# Question: Why 25 observations??`

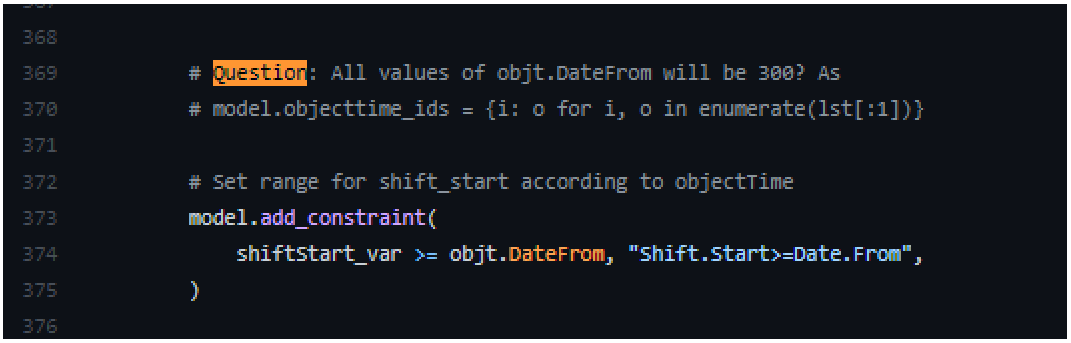


```
141      # model.number_of_overlaps = 0
142      model.availabilities = MEM_AVAILAVILITY
143      model.objecttimes = VACANCY_OBJECTTIME
144      model.worksite_refs = MEM_WORKSITE_REFERENCE
145      model.shift_refs = MEM_SHIFT_REFERENCE
146      # Question: Why 25 observations??
147      model.member_measurement = MEM_MEASUREMENT[:25]
148      model.shift_constraints = SHIFT_CONSTRAINTS
149      model.vacancy_detail = VACANCY_DETAIL
150
151
152  def setup_data(model: Model):
153      model.members = {m.ContactID: m for m in model.member_measurement}
154      lst = list(set(model.objecttimes))
155      lst.sort(key=lambda x: x.DateFrom)
156      model.objecttime_ids = {i: o for i, o in enumerate(lst[:1])}
157
```

At line 146, I just limited the number of members who might be assigned.
Also, at line 156 I limited the number of days of the vacancy.

Why: I limited them because I want to reduce the running time.

2. Question-2

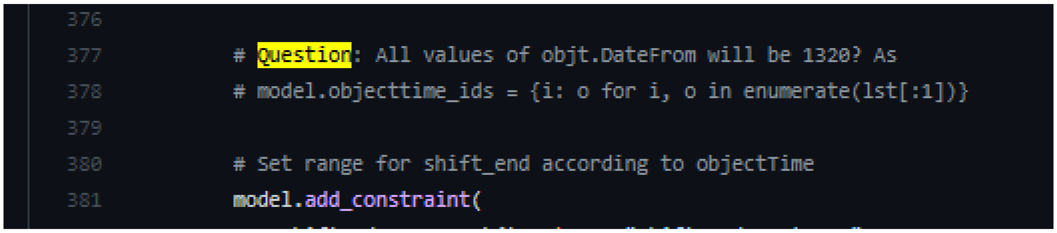


```

        # Question: All values of objt.DateFrom will be 300? As
        # model.objecttime_ids = {i: o for i, o in enumerate(lst[:1])}

        # Set range for shift_start according to objectTime
        model.add_constraint(
            shiftStart_var >= objt.DateFrom, "Shift.Start>=Date.From",
        )

```

Because I limited the number of days of vacancy to 1, so there is only 1 day (object-time) to be considered. The value 300 is the start-time of that day. 300 is 5:00 am counted from 00:00 of the first day of the vacancy.
For example, the vacancy is from 3/1/2022 to 10/1/2022. Then we consider the first day 3/1. That working day is start from 05:00 to 22:00pm then objt.DateFrom = 5:00 = 60*5 = 300 (mins), objt.DateTo = 22:00 = 22*60 = 1320 (mins). The second day may be the same or different

depends on the input excel data. If the second day is from 6am to 20pm then they will be converted to (6+24)*60 and (20+24)*60

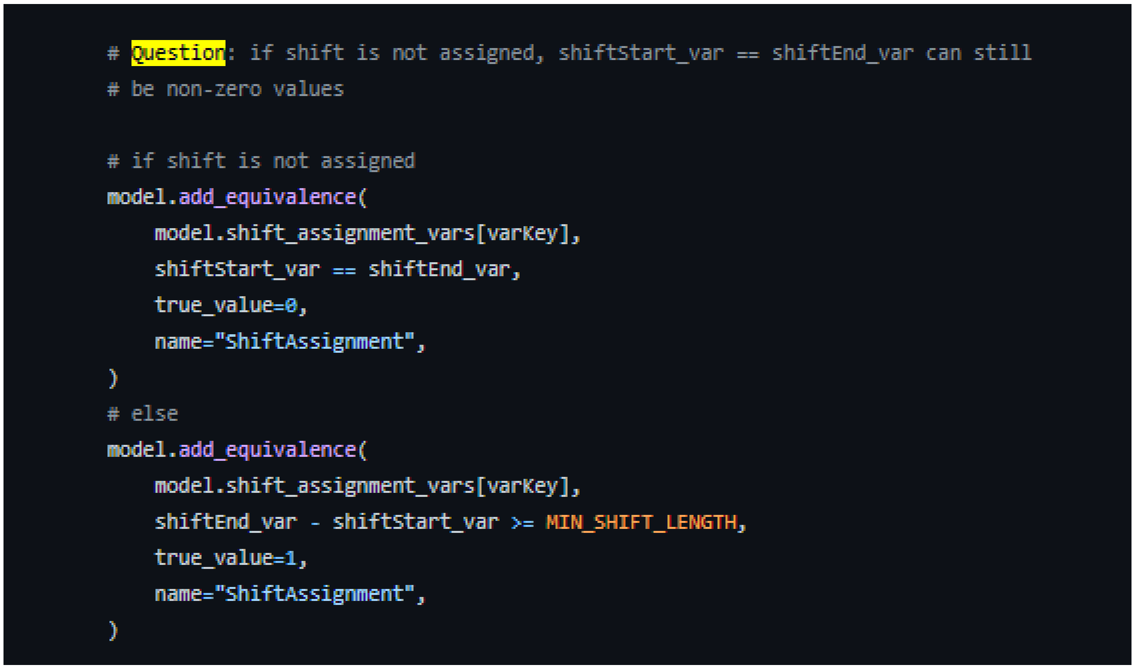
3. Question-3



```

        # Question: All values of objt.DateFrom will be 1320? As
        # model.objecttime_ids = {i: o for i, o in enumerate(lst[:1])}

        # Set range for shift_end according to objectTime
        model.add_constraint(
```

I answered this on the question 2 above. 1320 is the DateTo of the first considered day, every day will be differrent

4. Question-4



```
# Question: if shift is not assigned, shiftStart_var == shiftEnd_var can still
# be non-zero values

# if shift is not assigned
model.add_equivalence(
    model.shift_assignment_vars[varKey],
    shiftStart_var == shiftEnd_var,
    true_value=0,
    name="ShiftAssignment",
)
# else
model.add_equivalence(
    model.shift_assignment_vars[varKey],
    shiftEnd_var - shiftStart_var >= MIN_SHIFT_LENGTH,
    true_value=1,
    name="ShiftAssignment",
)
```

There is a flag binary variable to say a shift is assigned or not. If the flag is True then this shift is assigned as well as Shift_end – Shift_start >= MIN_SHIFT_LENGTH. Otherwise, the flag is False.