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Concepts of Programming Languages, Spring Term 2022
Project 1: Public Test Cases

In the following example, there are 3 TAs named 'k', 'm' and 'n' teaching the same course with the below schedule. Our job is to split the slots between them given that 'k' has to teach 8 slots, 'm' has to teach 4 and 'n' has to teach 3 slots per week.

Slot	First	Second	Third	Fourth	Fifth
Sat	T1	T2	T3,T4	T5	-
Sun	-	-	-	-	-
Mon	-	-	-	-	-
Tues	-	T6,T7	-	-	-
Wed	-	T8,T9	T10	T11	-
Thurs	T12	-	T13	T14	T15

Below are possible queries and their corresponding outputs. Make sure your code covers the examples listed as they will be used to test your project.

```
?- ta_slot_assignment([ta(k, 8), ta(m, 4), ta(n, 3)],RemTAs,m).
RemTAs = [ta(k, 8), ta(m, 3), , ta(n, 3)];
false.

?- slot_assignment(2, [ta(k, 8), ta(m, 4), ta(n, 3)],
                                        RemTAs,Assignment).
RemTAs = [ta(k, 7), ta(m, 3), ta(n, 3)],
Assignment = [k,m];
...

?- max_slots_per_day([[m], [n], [m,n,k], [n,k], [n]], 3).
false.

?- max_slots_per_day([[], [m,n], [m], [k], []], 2).
true.

?- day_schedule([1,1,2,1,0], [ta(k, 8), ta(m, 4), ta(n, 3)],
                                        RemTAs,Assignment).
RemTAs = [ta(k, 6), ta(m, 2), ta(n, 2)],
Assignment = [[m], [m], [n,k], [k], []];
...
```

```
?- week_schedule([[1, 1, 2, 1, 0], [0, 0, 0, 0, 0],
                  [0, 0, 0, 0, 0] , [0, 2, 0, 0, 0] , [0, 2, 1, 1, 0] ,
                  [1, 0, 1, 1, 1] ],
                 [ta(k, 8), ta(m, 4), ta(n, 3)],
                 3,
                 WeekSched).
   WeekSched = [ [[k], [k], [k,m], [m], []],
                 [[], [], [], [], []],
                 [[], [], [], [], []],
                 [[], [k,n], [], [], []],
                 [[], [k,n], [k], [n], []],
                 [[m], [], [k], [k], [m]]
               ];
   WeekSched = [ [[m], [k], [k,m], [n], []],
                 [[], [], [], [], []],
                 [[], [], [], [], []],
                 [[], [k,m], [], [], []],
                 [[], [k,n], [k], [n], []],
                 [[k], [], [m], [k], [k]]
               ];
   ...

?- week_schedule([[1, 1, 2, 1, 0], [0, 0, 0, 0, 0],
                  [0, 0, 0, 0, 0] , [0, 2, 0, 0, 0] , [0, 2, 1, 1, 0] ,
                  [1, 0, 1, 1, 1] ],
                 [ta(k, 8), ta(m, 4), ta(n, 3)],
                 3,
                 [ [[m], [n], [m,n], [k], []],
                   [[], [], [], [], []],
                   [[], [], [], [], []],
                   [[], [k,m], [], [], []],
                   [[], [k,m], [n], [k], []],
                   [[k], [], [k], [k], [k]]
                 ]).
false.
```

Note that some of these queries have more than one possible solution. Make sure all the solutions you get are valid.