CS4123 Autumn 2016
Homework Assignment 2

Carpooling System

This little system belongs to a group of people who work together. There are two tables in their system, People and Schedule. The full tables are not shown. Because some of them work part-time, a new schedule is produced every week, to allow for flexibility.
Every member of the Carpool has a nickname, based on their first name, because there could be more than one person with the same first name.

People

Pname	Mobile	Extn	Drives
Mark1	087 1234567	3456	Golf
Mary1	086 2345678	4567	Megane
Mark2	085 5556789	4567	Almera
Joe4	086 2345777	3457	Passat
Jean1	086 0905678	3456	Golf
Dora1		3412	Megane
Jack1	086 0905678	3413	Passat
...	...	...	...

Schedule

Pname	Day	Arrive	Finish
Mark1	Mon	9.00	16.00
Mary1	Mon	9.00	16.00
Mark2	Mon	9.00	16.00
Joe4	Mon	8.00	13.00
Jean1	Mon	10.00	18.00
Dora1	Mon	9.00	16.00
Mark1	Tues	9.00	16.00
Mary1	Tues	9.00	18.00
Mark2	Tues	9.00	12.00
Joe4	Tues	9.00	16.00
Jean1	Tues	9.00	16.00
Mark1	Wed	9.00	17.00
Mary1	Wed	8.00	17.00
Mark2	Wed	8.00	17.00
Joe4	Wed	9.00	16.00
Jean1	Wed	9.00	16.00
Dora1	Wed	9.00	16.00
Jack1	Wed	8.00	17.00
…	...	...	...

Q1 Using **Names** and **Numbers** as your basic sets write set declarations for the domains
Nicknames, Times, Cars, and **Mobiles**

Q2 Using set extension, specify the set **Days**

Q3 Specify all the functions you can find in the table **People** above, using **Nicknames** as the domain of each function. Use the Attribute names as the function names. (Indicate partial or total functions as appropriate.)

Q4 Using the declarations so far, write set definitions for the following sets:

a) The names of the people who drive a Golf or a Passat.
b) What is the car driven by the person at extension 3413.
c) Everyone's mobile and extension numbers
d) The nicknames of the people who drive a Megane or work at extension 3456.
e) List the mobile and extension of everyone who drives a Golf.
f) Anyone who drives the same car as Joe4.

Q5 Specify a **binary relation** (i.e. with a Many-to-Many relationship) that can be found in the **Schedule** table. DO NOT use the Attribute names. Use the predicate **WorksOn**.

Q6 Using a binary relation as your domain, declare two **partial functions** with the set **Times** as their range – now use the Attributes, **Arrive** and **Finish**.

Q7 Using the declarations so far, write set definitions for the following sets:

a) People who work on Monday
b) Joe4's list of start times for the week
c) How many hours does Joe4 be working on Monday
d) Finish times for people who drive a Megane
e) Extension numbers of people who work on Tuesday.

Q8 Write the declaration for the **n-ary relation** that is the **People** table shown above.