

CS4513 Introduction to Systems Analysis
Autumn 2009
Homework Assignment 2

Podcatching

A friend of yours has been downloading a lot of podcasts from the Internet and storing them on his computer. The table fragment shown below indicates some of the information he is interested in keeping about the podcasts he has stored. You are going to help him to organise it in a database.

Podcasts

ID	Series	Episode	Length	Download	Bitrate	Played	Format	Filesize
1034	Liveline	Muggings	20	29-Sep-09	64	3	MP3	3.2
1035	Moneybox	Investments	30	23-Sep-09	128	1	MP3	4.2
1036	New Scientist	Global warming	25	30-Sep-09	32	0	MP3	5.0
1037	Travelbug	Western Canada	16	28-Sep-09	64	0	MP3	2.4
1038	Sportsworld	Olympics 2016	15	21-Sep-09	64	3	WAV	2.5
1039	Moneybox	Savings today	60	24-Sep-09	128	4	WAV	8.0
1040	Astrobiology	SETI Results	90	29-Sep-09	32	1	WMA	16.0
1041	New Scientist	Nobel prizes	45	29-Sep-09	32	1	WMA	8.0
1042	Travelbug	Excess baggage	20	22-Sep-09	64	0	WMA	3.2
1043	Liveline	Property tax	30	25-Sep-09	64	0	MP3	8.0
1044	Thinktank	Future Earth	25	25-Sep-09	128	0	WMA	7.5

The basic sets are **Names**, **Dates** and **Numbers**.

Q1 Write a declaration for the Domain **IDS**.

Q2 Write declarations for the other Domains from which the values in the table have been taken. These domains are to be called **Titles**, **Episodes**, **Minutes**, **Dates**, **Rates**, **Times**, **Formats** and **Sizes**.

Q3 Using your Domains, write the declaration for the n-ary relation **Podcasts**. Then write the declaration for a tuple in the relation; call it **P-tuple**.

Q4 Specify all the functions you can find in the table that would have **IDS** as their domain. Use the Attribute names as the function names. (Indicate whether the functions are partial or total.)

Q5 Specify any **other functions** (i.e. Many-to-One relationships) that can be found in the table. DO NOT use the Attribute names now.

Q6 Your friend wants to extend the table with Attributes for **Released** (which takes a date) and his own personal **Rating** which is either one, two, three or four stars. Use set extension to introduce the new domain you need and then specify the functions you will need for these two Attributes.

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

- The IDs of podcasts that have been played more than once.
- The IDs and series titles of podcasts in MP3 or WMA format.
- The rating, length and bitrate of the longest podcast.
- The lengths of these podcasts: 1021, 1031 and 1041.
- The length and series title of podcasts on savings or investments.
- The elapsed time between podcast 1042 being released and downloaded.
- The format and bitrate of Liveline podcasts.
- The bitrate, format and filesize of all podcasts under 60 minutes.
- List the IDs and episode names of podcasts that are neither WAV nor WMA format.
- Using De Morgan's Law, express the predicate part of the previous set a different way.



Put your bar-code in this
position on **the front**
of your assignment

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- *Do not write your name or your ID number **anywhere** on the assignment you submit.*
- *You have received a set of bar-codes with your ID number encoded on them. Please stick one of these in the **top right-hand** corner of (the first page of) your submission.*
- *You may hand up a hand-written or typed assignment, as long as it is on plain or lined A4 **white** paper.*
- *Use single sheets of paper, please, **stapled** together if necessary. Do not use a paper clip.*
- *Do not bind or package the assignment in any other way. Any plastic covers received will have to be discarded.*

Thank you for your cooperation.