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Ark Home Test 1



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Instructions:

This is an open-book test.

All questions should be attempted, please note any assumptions made where appropriate.

You have 24 hours to submit your answers for the test.

You may consult any sources or reference books to aid you in answering the questions given. However, it is important that you fully understand your answers as you will have to explain how you arrived at your answers should you be shortlisted for a further interview.

Please submit your answers by email (to andrea.cuneo@ark-energy.eu) with links to compiled and working code using an online IDE or online coding playground such as SQL Fiddle (<http://sqlfiddle.com/#!3/5e731/1>) or similar online playground tools (<https://www.tutorialspoint.com/codingground.htm>).

It is your own responsibility to ensure that you have attached the correct links, and that the submitted code can be executed.

Please include any relevant notes or assumptions in the format of code comments, or in the body of your email response

Database Joins

Using the following Tables as reference please write SQL queries for each of the following

- Example of the different types of outer Joins
- Examples of the different types of inner Joins
- Best performing market in terms of price in 2007
- Average number of CV traded across 2006-2014
- List years where the price average weighted of green certificates, is greater than the sum of the lowest two performing electricity markets for that year

Electricity market trading – yearly summary – average price (€/MWh)

reference period	IPEX	EPEX Germany	Nord Pool	OMEL	EPEX France
2004	51,60	28,52	28,91	27,93	28,13
2005	58,59	45,97	29,33	53,67	46,67
2006	74,75	50,78	48,59	50,53	49,29
2007	70,99	37,99	27,93	39,35	40,88
2008	86,99	65,76	44,73	64,44	69,15
2009	63,72	38,85	35,02	36,96	43,01
2010	64,12	44,49	53,06	37,01	47,50
2011	72,23	51,12	47,05	49,93	48,89
2012	75,48	42,60	31,20	47,23	46,94
2013	62,99	37,78	38,35	44,26	43,24

Green certificates – annual summary

year	Price weighted average (€/MWh)	CV traded (no.)	value including VAT (€)
2006	110,40	10.174	1.123.180
2007	120,19	8.202	985.787
2008	77,87	753.163	58.648.028
2009	88,46	6.071.112	537.022.379
2010	84,41	2.578.638	217.670.600
2011	82,25	4.126.473	339.386.028
2012	76,13	3.806.339	289.787.555
2013	83,73	7.566.341	633.505.717
2014	90,96	4.615.812	419.836.791

Coding Test

Question 1

In an OOP language of your choice please solve the following problem:

Three Chihuahuas and three cats are in the waiting rooms of a veterinary surgery to get vaccinated. Only two animals can go into the surgery at the same time.

The animals are nervous and want reassurance from a vaccinated animal that all is ok, so each time a pair of animals are vaccinated one is returned to the waiting room, while the other is placed in the recovery room.

All animals must be vaccinated before getting fed and let home to their owners.

Chihuahuas are small, but if they ever outnumber the cats in either the waiting room or recovery they will attack the cats.

Find a series of vaccinations that will get all the animals safely vaccinated and allow them home.

Question 2

Given the following information, you are required to write a command based program which takes in two parameters a Year and a weekday.

It will then output the number times that weekday fell on the first of the month in the given year

- 1 Jan 1900 was a Monday.
- Thirty days has September, April, June and November.
All the rest have thirty-one, saving February alone, which has twenty-eight, rain or shine.
And on leap years, twenty-nine.
- A leap year occurs on any year evenly divisible by 4, but not on a century unless it is divisible by 400



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Web development

Using a modern web-based framework of your choice, create a simple webApp on any topic. It must fulfil the following criteria

- Single page application
- Contain three sections which are accessed via a menu on the page
- Responsive – be functional and useable on various platforms
- Use bootstrap grid system
- Illustrates an understanding of data models