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Y12 to Y13 Computer Science Summer Independent Learning Activity
Hand in on your first lesson back in September

Aim of the activity:

To develop and review your A2 knowledge and skills that have been revised over the Summer holidays to help support your progression towards your MTG.

Theses activities are to assess your skills and progression in the use of object orientated programming, SQL, HTML and CSS scripts and your theoretical understanding and coding ability so that you can develop these skills for your A2 project and for the A2 examination.

You will be provided with all of the resources to complete the activities which will consist of online tutorials and exercises. Please ensure that you also do your own further research and practice.

You can submit the results of your activities in a word processing document or presentation alongside any print screens of sample code files.

You can use a programming language of your choice, but it will need to be a higher level language such as Python or Java. You will also be expected to scan in hand written pseudo code algorithms.

Object orientated Programming: 2 hours

Research and read the following material and then answer the sample exam questions.

https://www.python-course.eu/python3_object_oriented_programming.php

Class and attributes:

https://www.python-course.eu/python3_class_and_instance_attributes.php

Properties and Getters:

https://www.python-course.eu/python3_properties.php

Inheritance:

https://www.python-course.eu/python3_inheritance.php

Multiple Inheritance:

https://www.python-course.eu/python3_multiple_inheritance.php

Inheritance Examples:

https://www.python-course.eu/python3_inheritance_example.php

SQL Tutorials: 1 hour
https://www.w3resource.com/sql/tutorials.php
Work through a range of the SQL tutorials, make sure you can create/alter/drop, SQL functions, SQL Operators, query and join. Check your answers against the mark schemes.

CSS Tutorials: 1.5hrs

https://www.w3schools.com/css/default.asp

Work through the tutorials for CSS scripts and also complete the CSS scripts exercises. You need to be able to construct a CSS class in the exam hand written out. Use paper to write out your exercises rather than online to ensure you emulate the exam conditions. You need to understand what a CSS script is and how it works.

https://www.youtube.com/watch?v=UdHK35N-Kuo&index=1&list=PLCiOXwirraUB7V2i0SJ4SSJFqRV_LtgzW

https://www.youtube.com/watch?v=NTuZBrhYq2M&index=3&list=PLCiOXwirraUA-oG_EN3G46jVG0E_G4eBt

Written Questions 0.5hrs:

1. Describe what is meant by the term inheritance [3]

2. Research and discuss the advantages and disadvantages of using object orientated language over procedural language and refer to inheritance, encapsulation and polymorphism in your answer. [9]

3. Write a SQL query using Boolean operators to display all customers with a grade above 100. **[2]**
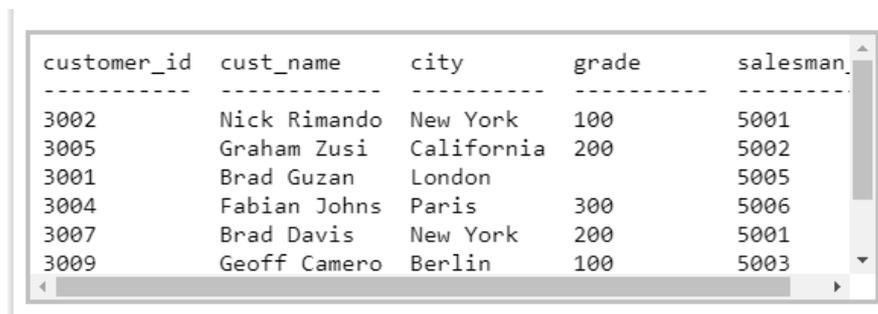
```
customer_id  cust_name       city        grade       salesman_
-----------  ------------    ----------  ----------  ---------
3002         Nick Rimando    New York    100         5001
3005         Graham Zusi     California  200         5002
3001         Brad Guzan      London                  5005
3004         Fabian Johns    Paris       300         5006
3007         Brad Davis      New York    200         5001
3009         Geoff Camero    Berlin      100         5003
```

Sample table: customer

4.   Write a query in SQL to display the full name (first and last name), and salary for those employees who earn below 6000. **[3]**
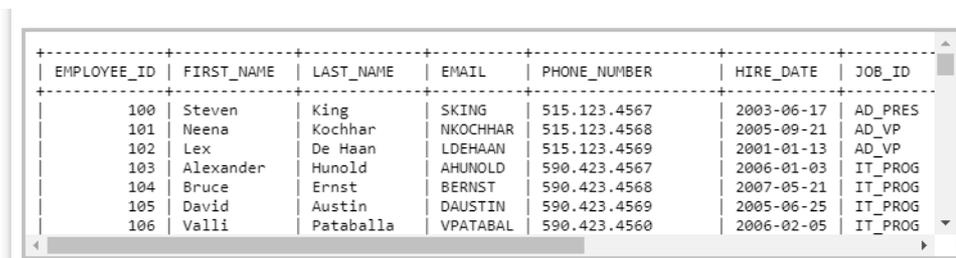
```
+-------------+------------+-----------+----------+---------------+------------+---------+
| EMPLOYEE_ID | FIRST_NAME | LAST_NAME | EMAIL    | PHONE_NUMBER  | HIRE_DATE  | JOB_ID  |
+-------------+------------+-----------+----------+---------------+------------+---------+
|         100 | Steven     | King      | SKING    | 515.123.4567  | 2003-06-17 | AD_PRES |
|         101 | Neena      | Kochhar   | NKOCHHAR | 515.123.4568  | 2005-09-21 | AD_VP   |
|         102 | Lex        | De Haan   | LDEHAAN  | 515.123.4569  | 2001-01-13 | AD_VP   |
|         103 | Alexander  | Hunold    | AHUNOLD  | 590.423.4567  | 2006-01-03 | IT_PROG |
|         104 | Bruce      | Ernst     | BERNST   | 590.423.4568  | 2007-05-21 | IT_PROG |
|         105 | David      | Austin    | DAUSTIN  | 590.423.4569  | 2005-06-25 | IT_PROG |
|         106 | Valli      | Pataballa | VPATABAL | 590.423.4560  | 2006-02-05 | IT_PROG |
```

Sample table: employees

5.   Write the HTML to reference an external style sheet [1]

6.   Write the class constructor for a CSS script named grid container to create the following:

Header, unequal columns and
footer:
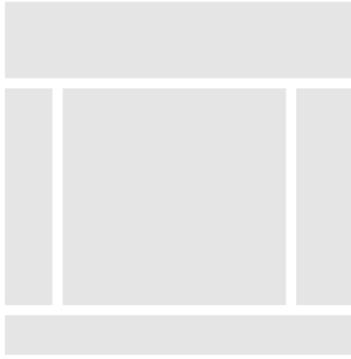
Hand write out your algorithms – as in your exam you will need to write the algorithms. Photo the hand written algorithm and insert into your notes.

Add a glossary that lists all of the key word and descriptors you have learnt.

Then upload all of your learning notes, print screen evidence of your coding with annotations and glossary in a Word document as your final submission of your Summer Learning Activity.

Remember you will be assessed on this in your first week at college.

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