Project Tutorial 3
Time-saving Development Tips

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Tips for working in HTML

View source

- Right-click > View page source.
- Can use this to learn HTML.

```
<!-- MAIN CONTENT -->
<div class="site-content__main">
  <article class="article">
    <h1 class="heading">UCL Computer Science</h1>
        <section class="content-box news-summary">
      UCL Computer Science is home to some of the world's most influential and creative resear
        <div>  <p><span><span><span><span><span>A global leader in experimental computer scien
          <div><div class="field-collection-container clearfix">
  <section class="threecolumns">

                <section class="teaser">
                                <a href="https://www.ucl.ac.uk/computer-science/study" tit
              <img class="teaser__img" alt="Learn with us" src="https://www.ucl.ac.uk/comput
          </a>
          <div class="teaser__body">
                          <h1 class="teaser__title">
            <a href="https://www.ucl.ac.uk/computer-science/study">Learn with us</a>
            </h1>
                        <div class="tag__heading--teaser-overlay-border"></div>
          <p>Our degree programmes recognise the ever-increasing importance of computer sy
          </section>


            <section class="threecolumns__column2 noHeader">
              <section class="teaser">
                                <a href="https://www.ucl.ac.uk/computer-science/collaborat
              <img class="teaser__img" alt="Partner with us" src="https://www.ucl.ac.uk/comp
          </a>
          <div class="teaser__body">
```

Web browser dev tools

- Most browsers have a set of development tools either built in (may need to be enabled in options), or available as a plugin.
  - Open quickly using right click > Inspect element.
- Can view source code, inspect elements and CSS, plus many other functions.
- Moving cursor over the source will highlight where on the page the code relates to.
  - Can visualize effect of (removing) CSS.

Browser console

- One of the dev tools' tabs
- Displays error message and print statements from the browser generated when loading current page (e.g. when using JavaScript).
- Very useful for working out why your page isn't displaying properly!

Tip: Using version control

Version control

- A version control tool (Subversion, git).
  - Saves the current state of your project.
  - Allows multiple users to access and edit files simultaneously.
  - Keeps a record of how the project has changed over time.

Getting started with git

- Install git: https://git-scm.com/downloads
- Create a shared repository on GitHub using its web interface.
- Checkout repository using command line (or some IDEs will help you with this).
  - git clone [URL that GitHub provides you with]
- May be helpful to clone to your *AMP www (htdocs) directory.

Git workflow

- Stage changes to files using ‘git add [filename]’.
  - Adds the changes in that file to the list of changes you’re proposing to make.
- Use ‘git commit’ to update your *local* repository with a snapshot featuring all the changes you’ve added.
  - Add a comment to describe what you did.

Git pull

- Use pull frequently to get the most up-to-date changes from remote repository.
- A pull will also automatically attempt to merge those changes into your files.
- Merge conflicts: git will do sensible merges but it's not a mind-reader.
  - (e.g. how to handle when you and a collaborator change the same line in different ways?)
  - Need to manually resolve those confusions and commit the final decision.

Git push

- Once you've staged your changes using 'git commit', publish them to the repository using 'git push'.
- Stage and push frequently to keep other group members in the loop and prevent conflicts.
- Guides exist (e.g. http://rogerdudler.github.io/git-guide/).

Tips for using MySQL

Working with MySQL

- There are lots of tools available for working with MySQL databases:
  - mysql command line tool,
  - phpMyAdmin,
  - MySQL Workbench,
  - etc.
- I suggest...
  - Create SQL scripts, edited in an editor or IDE and shared with teammates via git.
  - Load scripts using phpMyAdmin tool.
  - Make sure your database/table definitions are properly recorded.

Creating a database

```
DROP DATABASE Example;

CREATE DATABASE Example
  DEFAULT CHARACTER SET utf8
  DEFAULT COLLATE utf8_general_ci;

GRANT SELECT, UPDATE, INSERT, DELETE
  ON Example.*
  TO 'exampleuser'@'localhost'
  IDENTIFIED BY 'mypassword';

USE Example;
```

Create a table

- A basic first example:

```
CREATE TABLE Users
(
   id INTEGER AUTO_INCREMENT PRIMARY KEY,
   first_name VARCHAR(40) NOT NULL,
   family_name VARCHAR(40) NOT NULL
)
ENGINE = InnoDB;
```

- Table design is important.
  - Scripts allow rapid experimentation with table designs without locking you into something.

MyISAM vs. InnoDB

- Two different database engines (MySQL supports both even in same database).
- MyISAM
  - Used to be the default.
  - Fast but not transaction-safe.
  - Up to 64 keys per table and maximum key length of 1024 bytes. Allows Full Text columns. No Foreign Keys.
  - Supports full-text search.
- InnoDB
  - Transaction safe, row-level locking.
  - Foreign keys are supported.
  - Slower (perceived) performance.
  - No full text search.

Add sample data

- Often useful to add some sample data via a script to avoid having to type it in repeatedly.
- Just use SQL INSERTs.

```
INSERT INTO Users (first_name, family_name)
  VALUES ('firstName1','familyName1');
INSERT INTO Users (first_name, family_name)
  VALUES ('firstName2','familyName2');
INSERT INTO Users (first_name, family_name)
  VALUES ('firstName3','familyName3');
```

- Or use INFILE with a stored file

Loading scripts

- Entire scripts can be loaded into MySQL using the source command in the MySQL console:
  - source createdb.sql
- Or you can copy and paste parts of a script into phpMyAdmin via the SQL tab.
  - You will need to create the database using the create database form.

Running queries

- Once you have set up a database with example data, use:
  - `SELECT * FROM Users;` to confirm the table contains data.
  - `SHOW databases;` // List databases that exist
  - `SHOW tables;` // List tables in current database
  - `DESCRIBE Users;` // Show column definitions
- Or you can use the various tabs within phpMyAdmin.

Back up your database!

- Use phpMyAdmin, Export Tab, to create a dump of a database.
  - This will save all the data as a text file of SQL commands.
- Use Import Tab to import.
- This can also be done from the command line using mysqldump but more complicated to get working with XAMPP on lab machines.

TODOs this week

- Upload your draft ER diagram.
- One member of your team should set up a Github project and the rest clone it to an appropriate place on their computers.
- Play around with making SQL databases/scripts for your server.
  - Remember you can make changes in the future!