

Enterprise Computing Coursework

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- 1 What did I miss?
- 2 What are we supposed to do?
- 3 What do I get out of this?
- 4 What's the bigger picture?
- 5 Closing

What did I miss?

- If you're just joining the course today you should know that there is an assessed coursework, done in teams.
- Teams have five members, or maybe six. It is possible for team membership to change if students join or leave the course.
- Teams were drawn up by the course lecturer in a high-handed and arrogant fashion before the first lecture.
- Team leaders were appointed by the course lecturer. No-one asked to be a team leader, or was asked if they wanted to be a team leader. Just do your best, even if you don't feel leaderly.
- Students on the course received notification of which team they were on by email to their `sms.ed.ac.uk` email address sent on Thursday 15th January.
- For privacy reasons, lists of teams with student's names and email addresses are not posted on the course website.

Outline of the coursework (Repeat)

- The goal of the coursework is to make use of a newly-released Open Data API made available by Transport for Edinburgh.
- The API is available at <http://tfe-opendata.readme.io/v1.0>
- From the API you can request data about stop locations, service routes, journey planning, timetables and live bus locations for the city of Edinburgh.
- To access the API and use it you need an API key which looks like this: 0c627af5849e23b0[REDACTED]030[REDACTED]73525508[REDACTED]

Frequently asked questions (1/2)

- Are you going to teach us PHP, XML, and JavaScript? Or are those things supposed to be already known?
 - I may include some material on XML, but likely not much at all. PHP is not a crucial component of the project, so I will not be teaching it. XML is also only tangentially involved. If you do not know these things and you decide to learn them to use them in the coursework then you will have to learn them yourself. There will be material on TypeScript/JavaScript.
- Does this course include labs?
 - No, there are no labs. Teams self-organise themselves and work at their own pace according to their own timetable. In any case, your solutions are going to use such a diverse range of technologies that it would be impossible to find a demonstrator to cover everything.

Frequently asked questions (2/2)

- Since we are obliged to use Typescript, does that mean we cannot use Bootstrap since it uses JavaScript at times?
 - No, please use Bootstrap: it's great. You can use any pre-existing JavaScript libraries or web frameworks that you like, the requirement is only that the original code that you produce should be in TypeScript (a superset of JavaScript).
- You said "you should make the open data information accessible". Does that mean we should deploy our product on a web server?
 - Yes, I think that using a web server is going to be pretty much impossible to avoid.

Buses: they're great!



(Photo credit: Münster city council.)

Smart public transport

Compared to many UK cities, and most rural areas, transport in Edinburgh is “smarter” than many others.

- Real-time bus tracking information;
- Service information on the web;
- Service information available via apps;
- Web service for app developers to use.

Transport has evolved



Modern buses have evolved considerably:

- Communications: GPS positioning, wi-fi, sensors and instrumentation, audio-visual stop announcements (sometimes).
- Cleaner, quieter and smoother: diesel-electric parallel hybrid engines, regenerative braking.

Different stakeholder viewpoints

- **Passenger-centric:** have as many buses as possible, have waiting time at a stop approach zero, have the most efficient journey possible, have bus occupancy as low as possible.
- **Operator-centric:** have as few buses as possible, have bus occupancy approach 100%, have the most efficient service possible, have the most adaptable service possible.
- **Driver-centric:** have routes be as simple as possible, have incidents of overtaking approach zero, have typical bus occupancy well below 100%, have the most predictable service possible.
- **Environment-centric:** have as many buses as possible(?), have the most efficient routes possible, have carbon emissions approach zero, hybrid diesel-electric vehicles, have noise levels approach zero (who could object to that?).

This guy.



Signage.



Then there's this.

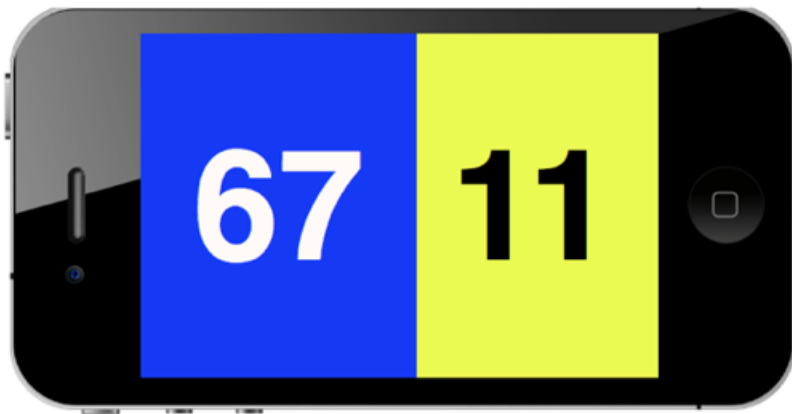


If you were at the lecture then you heard me explain in words what this is.

On the bus.



And don't forget.



If you were at the lecture then you heard me explain in words what this signifies.

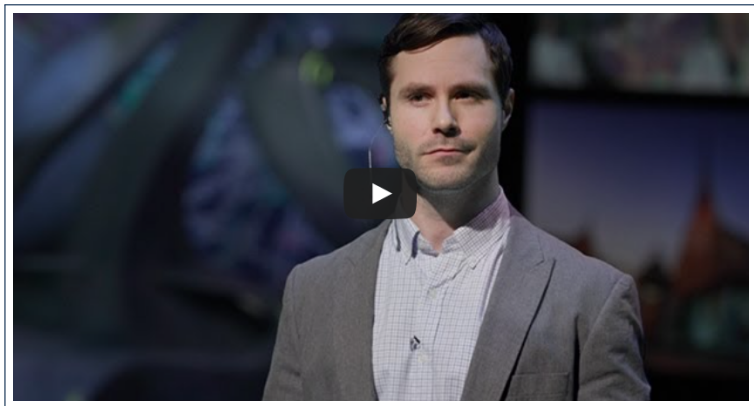
And of course.



If you were at the lecture then you heard me explain in words what this signifies.

Or turn bus timetables into music . . .

. . . if you want to do that for some reason



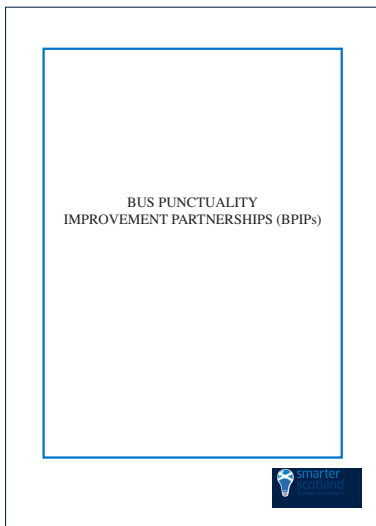
Or, ...



If you were at the lecture then you heard me explain in words what this signifies.

Regulations and guidelines

Bus Punctuality Improvement Partnerships, 2009



- **Punctuality:** the percentage figure is calculated as the number of journeys operated between **60 seconds early and five minutes late**, divided by the total number of journeys scheduled.
- **Reliability:** the percentage figure is calculated as the **number of miles not operated**, divided by the total number of miles that were planned to be operated.

But, ...



If you were at the lecture then you heard me explain in words what this signifies.

Non-functional requirement (#2 of 10)

<https://www.youtube.com/watch?v=3YVV8wEpjd8>

The non-functional requirements of the coursework are revealed as the course goes on. This clip represents non-functional requirement #2. If you were at the lecture then you heard me explain in words what it means.

Building your portfolio

- In a job interview context, employers will sometimes ask to see examples of your development work: **your portfolio**. (“Portfolio” might make you think “art”, but science *is* art.)
- Your portfolio consists of things that you have done, projects you have been involved in, apps you have published, and other things that you have made.
- When someone in a job interview asks to see your portfolio, don't give them your “What do you mean?” face, point them to the web site or code repository for this project.
- You are at liberty to do whatever you want with your code at the end of the project. It is your intellectual property. (**Caution:** please do not give away the API key. This is secret.)

Putting the coursework in context

- One extremely exciting opportunity for all informaticians and computer scientists is the emerging field of **data science**.
- Data scientists are often very creative people with visual flair, and the technical skills to bring data to life. In your coursework, you are bringing the Transport for Edinburgh open data to life. (There are lots of different ways of doing this.)
- Data scientists may have some knowledge of statistics, but they are not usually hard statisticians.
- Data scientists use languages like R, Python and JavaScript to visualise information. **Big data is nothing without it.**
- Visualisation of data can be incredibly powerful in bringing information to life, allowing people to make clear-sighted informed decisions, and changing hearts and minds.
<http://drones.pitchinteractive.com>

Three terms you should know

When discussing software, there are three terms which you should know.

Three terms you should know

- Dog fooding.
- Shim code.
- Source code escrow.

Things to do now

Some things to do now

- Did you arrange a meeting of your team? If not, then you should.
- Decide the frequency of meetings. A fixed time and place and date saves time over choosing anew each time.
- Discuss some of the possible directions presented here. There may be some you can immediately rule out. Others might be worth pursuing.
- Bring your own ideas to the meeting. You don't have to do any of the above.
- Find out about Bootstrap. What is Bootstrap?
- Find out more about TypeScript. Keep learning TypeScript.
- Find out more about JSON. Keep learning JSON.

Live long and prosper

