**5COM1053\_61 Computer Science/Information Technology Development Exercise**

2019\_20 Blastonbury Entry and Access Monitoring system - BEAM

**GP3 Case Study Assignment Briefing: Implementation & Demonstration**

This “GP3” assignment concerns the case study briefing documents, provided with GP1 & GP2, which outlined the background to the proposed prototype “BEAM Entry and Access System” (BEAM).

Note: Part 2 of this document provides an update of some changes in the specification of the BEAM system. You MUST use this updated specification for this assignment. Where there are differences between GP1 GP2, this document has precedence over all previous ones.

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1: Introduction

1.1 Aims

This assignment is designed to give you practice in software engineering implementation techniques. You will use technologies and experience challenges often found in contemporary software development.

The **technologies** include the following design techniques: web-based architecture (including the Model-View-Controller [MVC] architectural pattern) and object-oriented design, and for implementation: a software development platform and framework, which include components written using PHP, SQL, HTML, CSS, and JavaScript.

The **challenges** include:

* teamwork, including leadership & negotiation (building on your experience in GP1& GP2
* planning, time management, and fixed deadlines
* demonstrating software to a notional “business client”
* coping with a complex (possibly incomplete and inconsistent) brief
* reading technical documentation and obtaining technical support from a “software supplier”

1.2 Background Briefing

BEAM want you to showcase the capability of the EasyPHP development platform and to use it to implement a prototype for the BEAM system.

The advantage of this is that you will not have to implement a complete system and will have an opportunity to identify and fix a smaller range of problems. Using a platforms means that you will only need to edit existing code, not to create programs from scratch, and so will speed up development. The platform's underlying technologies are all industry standards: HTML, CSS, PHP, JavaScript and SQL, and so are scalable

The BEAM system requires only some of the specification [GP1] and design [GP2] elements already produced and you can take advantage of work done for the DB module. Much of this earlier work will be useful, but you should only use what is relevant to the GP3 specification. In addition, your data model must take into account the requirements and constraints imposed on a data model by the CodeIgniter framework.

BEAM has provided additional documentation:

* Client’s Sample Data & User Stories,
* Client Priorities
* User Acceptance Test (UAT)

to be used in Agile planning and which BEAM will expect your system to handle.

At the demonstration, we will use the UAT to test your BEAM system, but may add some unscripted tests. Before the demonstration, you should test your software thoroughly against the UAT.

1.3 Tasks Overview

Use an Agile system development methodology using 2 Sprint Cycles to:

* identify an overall design (including data model)
* implement the required BEAM system

For each sprint cycle:

* identify priorities & aims and produce sprint cycle plan
* refine prioritised requirements and design solutions for the GUI (graphical user interface)
* develop software using the supplied framework
* test the software
* evaluate the sprint cycle & and plan the next one

By the end of the project :

* demonstrate the software to the client *[module staff]*
* evaluate your project and your project management.

Part 2: System Design

2.1 System Outline

BEAM intend to run the festival between 25th - 27th June 2020

* the ONLY **users** of this GP3 BEAM system will be the Festival Manager, Selby Date, staff in the Security Office and potentially Security Guards

The client has agreed that your BEAM system must implement the following functionality:

* maintain festival information: agents, bands, band members, stages, performances
* manage entry to BEAM stages for performances (advanced feature)
* respond to and log results of attempts by band members to enter stage areas for festival performances.

IMPORTANT SIMPLIFICATION for the prototype:

* ALL members of a band will be authorised for entry to a stage on which the band has a performance for that day. No need to authorise individual members

At the demo, your BEAM must show that it can handle information about the following:

* agents
* stages
* bands
* members
* festival performances
* responses to requests by members to enter stage areas for festival performances
* a log of actual entries to stage areas by a members [optional feature]

The Festival Manager, Selby Date has provided information about bands, stages and performances in the festival. During the festival, she may ask for performances to be cancelled, changed or new ones added.

2.2 Data Model

The data model for your BEAM must store all of the data required by the system. Your data model should include:

* “Main tables” (i.e. those tables that map to classes of objects identified in this application): band, member, stage, performance, authorisation. Your BEAM should allow CRUD operations on these tables
* at least one “join table” to show and support the relationships between tables
* Any additional tables (expected by the CodeIgniter framework) holding supporting information. For example, a “state” table, i.e. containing membership states of members, or titles, such as “Mr”, “Ms”, “Dr”, etc. These tables should appear in your data model, but BEAM need NOT have CRUD operations on them.
* Note: the entry log may be implemented in a number of different ways, not necessarily as a table

You will need to design and implement field names, structures, and relationships. You are advised to look at Client Sample Data, but should remember that this data has NOT been normalised (as required by Relational DB design) and may not be in a format required by Easyphp. Data model for this application may differ slightly from the data model for your DB assignment (differences shown in red)

* An ***Agent*** has :
* a unique agent number
* a given name,
* a family name
* a contact
* A ***Stage*** has:
* a number
* a name
* a backstage capacity
* ***a Band*** has
* a unique name
* a description (music type)
* a unique agent
* *a* ***Member*** has
* a unique member id number
* a title(Mr/Ms/Dr..etc),
* a given name, a family name,
* a band
* Job Type (in the band), band
* status: active, cancelled
* a member can belong to only one band
* NOTE: DOB required for the DB assignment is NOT requiredfor GP3
* has only ONE performance per day
* A ***Performance*** has:
* a unique performance id
* ONE Band, performing on ONE stage on ONE date at ONE start time
* it is the responsibility of the Festival Manager to ensure that a performance is as long as it needs to be and that no other performances are scheduled at the time
* ***Entry to a stage*** – (advanced features and not necessarily a record in a table)
* The stage entry system must determine whether a member is allowed to enter the stage area on that date. When implemented, there will be card readers at entry points to read the member ids. However, for the demonstration, your system should have keyboard input for:
  + the stage
  + date
  + member id
* It should be possible to view whether the entry is allowed or not, and an advanced feature will respond with a status message saying whether this entry was allowed (or not)
  + If a member accesses a stage when there is not a performance scheduled, their access should be denied. A member who has left their band (cancelled status) attempts to access a stage, their access should also be denied.
* Attempts to enter a stage area must be logged. A log entry may just be a line of text in a text file recording the member, stage and date, and whether entry was allowed or not, or may be stored as a DB record with fields to allow selected access to data. Entries in the log are created after a member attempts to enter a venue (and NOT pre-loaded into the DB)

Notes:

* a band may perform on:
* different stages on different dates
* the same stage on different days
* different stages on the same day
* on the same stage on the same day (but different times)

3 System Requirements

2.3.1 Functional Requirements

The system should

* support basic CRUD operations:
* create/add agents, bands, members , performances
* retrieval of information about agents, bands, members , performances, stages
* update for member(change membership status),
* delete performance (cancel)
* amending a performance should be done by cancelling the old one and creating a new one
* retrieve the log showing entry attempts to stages
* provide facilities to:
* simulate an attempt to enter a stage area : allow input of stage, date and member data and show whether the member is allowed to enter, or respond with an appropriate message (advanced)
* display and log the result of an entry attempt

Your system may have additional optional functionality (see Part 4 of UAT):

* automation of some common tasks, such as: display of selected information using selection criteria
* for entry check member belongs to the band giving the performance
* handle the departure of a member of a band (ensure entry not allowed)
* handle the deletion of a performance
* log entry attempts and allow flexible access to data
* check backstage capacity is not exceeded by an entry
* any additional features you consider desirable, but not explicitly stated in this specification

2.3.2 Non-Functional (Usability) Requirements

* The user interface should satisfy established HCI usability good practice.
* The system design should consider sensible "workflow" with an efficient sequence of actions, for example:

a form to enter a member details should confirm the data has been stored and issue a membership numbers

* System functionality should be as flexible as possible. Searching, selecting and amending individual records should be possible in different ways.
* The user interface should be both easy and efficient to use (by its target users). For example:
* the interface provides alternative views of the database, from displaying an existing single record, to displaying all appropriate records already in the database.
* such views of the data should be easy to display and update with minimum effort by the end-user, for example in a “one click”.
* users should not have to retrieve data by visually scanning all records, or by looking for arbitrary keys
* *utilise CodeIgniter and GroceryCRUD functions for ensuring data is presented in a user-friendly way*
* the user should be supported by error prevention/handling and meaningful/helpful comments. Error prevention could include asking users to select from menus, rather than entering data by typing into text fields.
* Optional Advanced Requirement (see Part 4 of UAT)

Security may be done by providing a login procedure. Login may differentiate between different types of users. Only the festival manager should be able to maintain festival information such as stages, bands, members, performances, In addition, she should be able to do all security office operations.

2.4 Teamwork & Agile system development

**2.4.1 Teamwork -** This is a **team-work** assignment   
All team members are expected to make equal contributions. These can take different forms: not just volume of work, but also specialist skills, knowledge, or leadership. You should plan for approximately equal contributions and we expect most teams will achieve this goal.

However, sometimes team members do not make equal contributions, and so there is an **individual assessment** component to mark which will reflect whether everyone has contributed, and to what extent. This will take the form of peer-group assessment, moderated by the module team (the demo examiners). For details, see Part 5.

As part of GP2, you were required to use tools for project planning, communication and version control. There are no marks for doing this in GP3, BUT you should see this as a sensible way to manage a project and maintain communications with your team members, especially if you cannot meet in person. You can use any project management application (a range of these, with advantages/disadvantages was provided in L08/L25). Most useful are those which provide repositories which allow members to "commit" work to be viewed by others. In addition, there will also be Sprint Cycle documentation (see section2.4.1)

An inability to meet in person will not be accepted as a reason for not completing coursework. If you use a project management application, it will be easy to provide evidence when a team member is not making an equal contribution, or is not responding.

**2.4.1 Agile system development using Sprint Cycles**

* Based on **User Stories &** **Client Priorities** and analysis of how to develop the system, at the start of each Sprint Cycle, your team will be expected to produce:
* A sprint cycle plan, using the provided documentation
* the plan should include a list of tasks for this sprint cycle, who will undertake them and an estimate of how long they might take
* this must be shown to the Sprint Master and his/her signature obtained

(sprint plans without the signature will not be awarded marks)

* your aim must be to produce a working testable system at the end of each sprint cycle
* At the end of each Sprint Cycle, the plan should be completed to show:
* which tasks have been completed
* bugs that still exist in the system
* the uncompleted tasks and bug-fixes should become the priority for the next sprint cycle
* Unfortunately, the client will not be available to test the system until the system is submitted, so you should designate a member/s of your team to act as "testers" (these should not be the "developers"). (Note these also do not have to be the same people for each cycle – roles can be rotated)
* You may append screen shots from project management software to Sprint plan documentation , in order to provide evidence of project management
* Sprint Cycle Documentation must be signed by a sprint master (staff member) by a given deadline – **check announcements for dates.**
* Plan for the **1st Sprint Cycle** must be signed by **28 Feb** to cover weeks beg 24/02, 02/03, 09/03
* Plan for the **2nd Sprint Cycle** must be signed by **13 March** to cover weeks 16/03, 23/03, 30/03

2.5 Using EasyPHP Platform and CodeIgniter framework

**2.5.1 EasyPHP & CodeIgniter**

The EasyPHP platform may be downloaded from the following location: [**https://drive.google.com/file/d/0B0Ou1lzzphIJbE12UncwQlQyb2M/view?usp=sharing**](https://drive.google.com/file/d/0B0Ou1lzzphIJbE12UncwQlQyb2M/view?usp=sharing)**.**

The **CodeIgniter** framework is already included within the EasyPHP platform above. Further information and documentation can be obtained from the following location: <https://www.codeigniter.com/>.

CodeIgniter supports the addition of template libraries (like add-ons). Some of these are produced by CodeIgniter itself and can be found at the link above. We have also included a template library called **groceryCRUD**, which is already included within the sample application. Further information and documentation can be obtained from the following location: <http://www.grocerycrud.com/>   
  
A MySQL database is provided within the EasyPHP platform. You can view the database via the included application phpMyAdmin. Once EasyPHP is running, use this URL to call the application: <localhost:8080/phpmyadmin>

The “Active Record” database pattern means that you should also adhere to the following constraints:

* Each table and corresponding columns from the MySQL database must have the **same** case-sensitive name used by Active Record, i.e. tables declared in the code (using CodeIgniter and groceryCRUD syntax) must match what has been set up in phpMyAdmin for the Object-Relational Mapping (ORM) to occur.
* Tables and columns should not be named using reserved keywords. Some of these may be obvious, but some are less so e.g. “union” which is not allowed since it is a relational operator. For a complete list of reserved (disallowed) words, see here: <https://dev.mysql.com/doc/refman/5.6/en/keywords.html>

See also the supporting teaching materials posted on StudyNet under lectures, tutorials, or lab exercises. You should also consult the **Development Platform FAQs** under StudyNet practicals folder for queries/problems.

**2.5.2 Support for the Software Implementation**

Support is available to clarify both the **BEAM system requirements** and for **technical information**, but we would like to direct questions to the appropriate staff member.

* for system requirements, **post Studynet thread prefixed “GP3: requirements - ...”** for example “GP3: requirements - is there a target screen size ?”.
* for technical support, **post Studynet thread prefixed “GP3: technical - ...”**

You can start a new thread if you like but be sure to check all existing threads and documentation for answers to your question, we will not answer questions we have already answered.

You can use the practical lab clinics to get support for coding, but we will not accept requests by email for new information nor clarification - since, to be fair to everybody, we wish to make such information available to all. We may also post updated information if we become aware of general issues (so please check )

2.6 Getting started

We assume you have attended lectures/practicals and can use a test-driven approach, understand architecture, constraints and use of EasyPHP platform /CodeIgniter framework and template libraries such as groceryCRUD.

* read the **User Stories** and **Client Priorities** provided and identify the stories/priorities for the current sprint cycle – identify the priority tasks for the current sprint cycle
* At each sprint cycle you should add functionality to your system
* However, you should have an overall idea of how you are going to develop the system and, in particular, you may wish to use your storyboards from GP2 to support the overall design for your user interface. ***However, producing/submitting new storyboards is NOT part of this GP3 submission.***
* use a test-driven approach to develop your system
* translate functional requirements and those in the UAT into tests
* save tests in a manageable file and use it to track how tests evolve, which tables they affect, what actions are required in order to achieve successful outcomes. Add tests as you progress.
* Produce a draft of the data model - *best done by discussion in the team*
* read Section 2.2 to identify and name entities attributes required
* check data in **Client's Sample data** to identify some required fields. **NOTE:** this does NOT meet all functional requirements, nor have all of the tables/fields required by the framework
* check functional requirements in 2.2 and 2.3.2 to identify any further tables
* check 2.3 for the constraints & requirements of a database in the framework
* produce a DB schema showing all fields in all tables (on a spreadsheet)
* enter the sample data from client, create and add any other data which is required
* Create a MySQL database. Use your data model to create the DB for BEAM and load in the sample data
* Develop the application and user interface: CodeIgniter and the template libraries included such as groceryCRUD provides a specimen application and a basic GUI, both of which you need to modify, improve and customise to implement BEAM.
* The most efficient way to develop the system is NOT to implement the whole DB and then try to code the functionality BUT to start by implementing no- or low-dependency tables together with their interfaces to access their data. small sub-teams can develop these in parallel and test each others work, so all team members get a chance to design, code and test
* Do not leave all of your testing to the end. Design tests BEFORE you start coding. Then test code as it becomes available.
* Ensure that you allocate plenty of time to the development of the customised GUI. Continuous adjustments to CSS code, JavaScript and HTML editing can be very time-consuming
* Use the UAT to anticipate and design solutions to issues which may arise during the demo
* To prepare for the presentation, record evidence and maintain a record during the development of how your team has organised itself and managed each stage.

NOTE: Section 4 of the UAT lists some advanced features (which includes login). You should NOT attempt these until you have a basic working system. You do not get a lot of marks for these advanced features, but they are there for ambitious students who want to extend their knowledge. You should certainly not be spending time on these if you are having problems with your basic system (just look at the allocation of marks !!!)

Part 3: Deliverables

3.1 Database Schema Documentation

* Create a database schema (diagram) to reflect the final version of your implemented database.
* This looks like an Entity Relationship Diagram (ERD) but depicts what is built and must match the database structure seen in phpMyAdmin (MySQL) within EasyPHP.
* Ensure each table is depicted with its attributes (including data type and length) and relationships between tables. Primary and foreign keys must also be indicated.
* Your diagram may be exported from a tool such as MySQL Workbench, which can also import/export the data structure from/to phpMyAdmin.

3.2 The Software

Your BEAM should:

* implement the functional and non-functional requirements given in *[Section 2.3];*
* consist of a set of fully working .php files plus any .css and .js files
* connect to a database (in our EasyPHP platform: this has to be an instance of MySQL) that can be accessed independently by a database management system (DBMS) (in the EasyPHP platform: phpMyAdmin). This will permit the examiners at the demo to verify that operations performed using your BEAM have actually made appropriate changes to the database;
* store all the sample data provided by the client.

While testing your system for validation/verification purposes prior to the demo, you may add additional data. However, the version of your application submitted for the demo MUST contain all of the sample data provided. **This test data set will be used by the staff to assess your software against the “User Acceptance Test” checklist (see additional document) to establish specific input/amendment/retrieval facilities.**

3.3 Sprint Cycle Plans

See section 2.4 and the Sprint Cycle Plan documentation provided

3.4 Test plans

The testers in your team should devise some test plans which test the expected aims of the system.  
Test plans should include: aim of the test, test data, expected outcome, actual outcome. Examples which you can use as a starting point, will be provided. Try to maintain this during development instead of doing it at the end

3.5 The Demonstration

The assessment of your BEAM will take place at your team’s demo; marks will be awarded according to how well your system satisfies the functional and usability (HCI)-related requirements given above.

It is your team’s responsibility to ensure that your BEAM (including the application and the database) (i.e. phpMyAdmin, which is provided within the EasyPHP platform) will be ready for use and working during the demo.

***Your BEAM will need to run on a PC in a CS lab, so you should test your software on this platform in advance. You should use Firefox as your web browser as it is standards-compliant.***

Personal laptops can **NOT** be used for the demonstration, **unless explicitly authorised** by the module leader, **in advance**. You are reminded to check the module pages on StudyNet regularly for further details about the demo timetable and other arrangements.

3.6 The Presentation

As part of the demo, you should deliver a short (no more than 5 minutes) presentation with maximum 6 slides to explain the processes you used to ensure the quality of your software and the management of your project. You should cover:

1. your team working – roles & responsibilities
2. an evaluation of your system: what it does well, what still has bugs, what was not implemented
3. overall analysis and reflection: lessons learnt; what we did right and what wrong

Produce the slides in advance (in a format such as Powerpoint) and submit a printout (6 slides to a page)

Note that the presentation should relate to your actual experience; this is **not** a role play.

3.7 Deliverables Overview

**3.7.1 For your coursework submission** - **All documentation to be submitted in a plastic wallet**

* your database schema documentation (printed copy)
* your software (soft copy on USB– identified with your team code)
* your 2 signed Sprint cycle plans (printed copy)
* your test plans (printed copy)
* your presentation slides
  + soft copy as a powerpoint presentation bundled on the USB
  + printed copy on one page – powerpoint “6 to a page” option)
* a completed “GP3 Roles and Contributions Form”, (individual forms if you disagree as a team; see below);

3.7.2 For your demo

At the demo, your software must be identical to that submitted on StudyNet.

Part 4: Submission Requirements

1. Submit to **CS Reception** by 02/04 at 16.00 , in a **clear plastic wallet**:

* **on a USB** (renamed with your team code)
  + all the software and other files for your system, (including your instance of EasyPHP containing your BEAM application) – so the demo can run just from your USB
  + presentation as a power point file
* **on A4 paper**:
  + Assignment Front sheet **signed by all contributing team members** and including **your team id**
  + your database schema (diagram)
  + your 2 Sprint Cycle Plans
  + your test plans
  + completed GP3 Roles & Contibutions Form
  + evaluation of user interface (if seletected in UAT part 5)
  + your presentation slides(printed copy on one page – powerpoint “6 to a page” option)

1. Submit to **Studynet**, by

* the above documentation and files – for a backup only. No need to include the EasyPHP application, but include a .sql file (export in phpMyAdmin) and the whole application folder for BEAM (i.e. root folder for BEAM as stored under EasyPHP/data/localweb)

Only **ONE COPY of each is required per team**. Diagrams/Sprint Plans should be scanned for electronic copy.

1. Your team must attend their **demonstration** as shown by a timetable to be announced later

* The USB submitted above should be used at your team’s demonstration.
* Your USB should contain all your software, both source and executable, with any other files needed for the software to run, including the database pre-loaded with test data, i.e. complete EasyPHP stack.

***You should test that your software works on a PC in one of the CS labs with Windows 10 and the Firefox web browser (not just on your own PC) before submitting your USB.***

Part 5: Assessment

5.1 Marking Scheme

This assessment is worth 20% of the mark for the module, with each team member awarded the same basic score, moderated by the member's contribution and the assessment of the clients [module staff]. During the demonstration, your assignment will be initially assessed against the UAT and given an assignment mark (out of 150). This will be converted to a percentage and scaled to 20% of the module marks.

5.1.1 Marking Scheme – Assignment

**“GP3 User Acceptance Test (UAT)”** has been provided by the client *[examiners from the module team]* and gives a detailed breakdown of how your BEAM demonstration will be assessed *[marked]*.

* The UAT shows the **type** of tasks that you will be asked to perform during a demo of your BEAM system.
* At the demonstration, the client will tell you what actual data to use.
* It is essential that your DB stores **ALL** data provided in “**Clients Sample Data & User Stories”.**
* **NOTE**: The client may find it necessary to make amendments to the content/order of the tests in the UATIf this happens, you will be alerted (by StudyNet) and a UAT with a new version number will be posted

Always consult the latest version.

* The **UAT** provides you with an assignment feedback form.

5.1.2 Questions at the Demo

During or after the demo, the client [module staff], may ask each individual team member one or more questions about your system, your software, or your contribution to the work of the team. While it is not essential for all team members to be involved with all of the tasks, it is expected that each member makes a significant contribution:

Based on a member's demo performance, answers to questions and roles listed on the GP3 Roles and Contributions Form and sprint cycle forms, staff reserve the right to change the % contributions attributed to team members

5.1.3. Marking Scheme – Team Contribution

Your team should consider and submit the “**GP3 Roles and Contributions Form”** posted with the assignment. This asks you to describe the role of each individual team member and provide a total percentage “contribution” that each has made to GP3 (including preparation for the demo). For example:

*Example (a):* if there are five team members and you consider that everybody has contributed equally, then everyone should be allocated 20%. The total must of course be 100%.

*Example (b):* if there are four members and you all agree that one person has contributed twice as much as everybody else, then he/she gets 40% and the other three get 20% each.

If you all agree then you should complete a single team form and bring it to the demo. If you cannot agree, then each team member who disagrees should complete the form individually instead. The module assessors [your lecturers] will resolve conflicting assessments by asking questions during the demo, consulting Sprint Cycle documentation and interviewing team members.

5.1.4. Marking – Individual

Individual student's GP3 mark will be calculated on the assignment mark. No individual team member can score higher than the mark awarded for the assignment. Where a team member's contribution listed on the “**GP3 Roles and Contributions Form”** (or adjusted by staff as listed above) is significantly **lower than the norm** (20% for a team of 5, 25% for a team of 4, etc.), they will be awarded only a proportion of the assignment mark (as for GP1 & GP2) shown

|  |  |
| --- | --- |
| **Contribution difference from the norm** | **% of assignment mark** |
| <= 5% difference | 80% |
| > 5% AND <10% difference | 60% |
| >=10% AND <=15% difference | 50% |
| >15% difference | 15% - 0% |

**Grading Criteria**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0–19 | 20–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70–79 | 80–100 |
| no... merit | clear fail | marginal fail | satisfactory | good | very good | excellent | outstanding |

Part 6: Assignment Checklist

|  |  |  |
| --- | --- | --- |
| **Task** | **Item** | **Done** |
| **1** | Read all the documentation, especially **User Stories** & **Client Priorities** |  |
| **2** | Identify an overall **project plan**, and produce an initial **Database Schema** (diagram) |  |
| **3** | Decide on priorities. Produce Sprint Cycle1 Plan. Get it signed by the Sprint Master  **Carry out the planned the tasks**, including:   * produce test plan/s * develop your software * test your software against the test plan using client sample data * review, make any corrections, re-test, and repeat.   At the end of Sprint Cycle 1 evaluate what has been achieved and identify what still needs to be done. Use this to decide on aims for Sprint Cycle 2: |  |
| **4** | Decide on priorities. Produce Sprint Cycle2 Plan. Get it signed by the Sprint Master  **Carry out the planned the tasks**, including:   * produce test plan/s * develop your software * test your software against the test plan using client sample data * review, make any corrections, re-test, and repeat.   At the end of Sprint Cycle 2 evaluate what has been achieved |  |
| **5** | Produce **the deliverables for the coursework hand-in:**   * your database schema documentation (diagram) (printed copy); * your software, including the specimen test data (on a USB);   + - test that your software works on the lab PCs (Windows 7 and Firefox) * your 2 sprint cycles plans, signed & evaluated * test plans |  |
| **6** | **Sign** the Assignment Front Sheet. All individual team members who contributed must do so; no signature means no mark. |  |
| **7** | Complete the GP3 **Roles and Contributions Form**(s) for submission. |  |
| **9** | Package your solution with the completed Assignment Front Sheet and Roles & Contributions Form in a transparent plastic folder with your team id **clearly visible** and the USB securely stored inside. |  |
| **10** | **Submit to CS Reception**: Your coursework by 01/04/18 11.00am |  |
| **11** | **Submit to StudyNet:** ONE zipped filecontaining **ALL** of your key files for the demo, including your software, database, and demo slides (but not the EasyPHP platform).   * it will only be used for **backup or quality assurance** purposes; * responsibility for this submission is with the team as a whole |  |
| **12** | **Prepare for the demo:**   * establish the time and the place for your demo and ensure all team members attend; non-attendance means no marks for the individual; * allocate roles (who will click through the system for the software demo, and who is speaking during the presentation). |  |
| **13** | Produce **the deliverables for the demo:**   * be ready to display/present; * load your software (submitted USB) on a lab machine as instructed by staff |  |
| **14** | **Attend the demo**. Then it’s all over! Wait for the written feedback, due after all the demos have finished. Use the experience you have gained to help pass the exam, do well in your final year project, and get a job in software development! |  |