

Database Systems Coursework 3  
(worth 10% of CS-250)

Date issued: 22 October 2024  
Deadline: 5 December 2024 11am

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This coursework is about SQL and PHP. **Important!** Please read through this coursework during the *first week* that it is issued and ensure you understand what is required. If you have any questions, please ask – **do not leave this until the last day or two before the deadline**. Do not under-estimate the time you need. Please also read the *General Notes and Advice* from past students below.

Coursework Marking Scheme

[100 marks]: Written Group Report and Hand-on (SQL & PHP)

Task 1 (60 marks):  
Two questions carry 50 (20+30) marks in total. Full marks will be awarded if your SQL statements produce the correct results. 10 Marks will be awarded for the clear presentation and formatting (including comments).  
You **must** show the SQL statement and the results obtained from your database (e.g., copy-and-paste the results or screenshots from a mysql console / PHPMysqlAdmin).

Task 2 (40 marks):  
You are required to submit your PHP code (in **pdf only**) that generates the “Order History” for any InvoiceID. 30 marks will be awarded if your PHP code works as expected. (Submit in pdf. We will read the code with our eagle eyes.)  
Up to 10 marks will be awarded if the generated order histories look as close as possible to the given ones:  
a) Provide screenshots of **three** order histories with **different** InvoiceID (see specification in Task2).  
b) Clear presentation and formatting (including comments for your code).

Coursework Submission (please read the instructions carefully)

You should submit the following to the Canvas assignment submission page:  
This CW requires both individual and group submissions.

- Individual Submission:**  
Submit a PDF containing your individual attempts for CW3. This section will not be graded, but will serve as evidence of your contribution in case of disputes or academic misconduct. Failure to submit your work will result in a score of zero for CW3, even if the group report shows your contribution. Submit your own attempts as early and often as possible.
- Group Submission:**  
Submit a written group report as a single PDF (one submission per group). This section will be graded. While it is a group submission, each member must first complete their individual work, followed by a collaborative group review. The final revised version should then be submitted. *Note, if one of the groupmates submits the pdf on Canvas, all groupmates will see the submitted pdf.*

Submission summary

	Graded	Details	Non-Submission Consequence
CW3 (Indiv)	No	- Please submit at least one PDF of your <b>INDIVIDUAL</b> attempts for CW3. You are allowed unlimited submissions, with new entries replacing previous ones while preserving all submission history, including timestamps. - These submissions will not be graded but will serve as important evidence of your progress and contributions to group work in case of disputes or academic misconduct. Please submit them as early and often as possible. - Ensure that you submit work completed <b>solely by yourself</b> . Group work should be submitted using the CW3 (Group) link. Otherwise, you risk committing academic misconduct.	Score of zero for CW3, even if the group-written report indicates that you have contributed.
CW3 (Group)	Manual	- Utilize the provided answer sheet (docx) and clearly outline individual contributions (in %). - Submit a group-written report (one PDF submission per group).	Score of zero for the whole group

**Important!**

- Once a group member submits the group PDF on Canvas, all members will have access to it.
- CW3 has a **10-page limit (A4)** with **a minimum font size of 10 for Arial or 11 for Times New Roman**. This applies to all content (incl. tables, images, handwriting) in your PDF. Text smaller than the specified size will receive a **score of zero**.
- Use the provided answer sheet (docx) and convert it to PDF before submission. Non-PDF formats (e.g., txt, docx) will not be marked. Only the last submission will be graded, and if your solution includes multiple PDFs, combine them into one.
- Estimate for CW3: at most 3 page (Task1) + 4 pages (Task2) < 8 pages. If your submission is more than 8 pages, your solution may be wrong. Check your answers and make good use of whitespace. You are given 2 extra pages as allowance.
- Please read the FAQs on Canvas under Module > Soft Skills before starting the coursework.

## Coursework Contributions

You are required to **work in a group of 5 students**.

You must use the provided submission link and answer sheet. All students in the same group will receive the **same marks** unless individual contributions (0-100%, see details below) are specified. The coursework (CW2 **AND** CW3) is designed for one student to complete **individually** in three weeks, but this year, we have generously extended the deadline to four weeks with separate deadlines. The group work is intended to encourage **discussion** and **sanity checks**, helping to 1) prevent careless mistakes, and 2) enhance your understanding of the material through discussion. You should follow the steps outlined below:

- Attempt the whole piece of CW3 **individually (DO NOT email or share work beforehand)**,
- Submit **evidence** of your **individual work** to the “CW3 (Individual)” submission link, as early and frequently as possible, as evidence of individual contribution. This part will **not** be graded.
- Then**, explain your attempts, discuss, and cross-check your work with your group during a meeting(s).  
(Best practice: Arrange multiple meetings, set milestones, and review your work in stages. Aim to submit early.)
- Expect discrepancies. Discuss these and convince one another through discussion and sanity checks.
- Revise the group answers accordingly.
- Finally, submit one consolidated piece of work for your group, to “CW3 (Group)” submission link.

These steps lead to equal contributions (100% for each group member).

## Coursework Marks Calculation

Your final coursework marks will be calculated as follows:

CW3 marks will be adjusted for fairness in cases of unequal group contributions, using the formula:

$$\text{CW3 Group marks} \times \text{Individual Contributions (in \%)} \times S_{\text{ind}}$$

where  $S_{\text{ind}}$  is the “CW3 (individual)” submission indicator:

- 0 if no individual evidence is submitted for CW3,
- 1 if individual evidence is submitted,

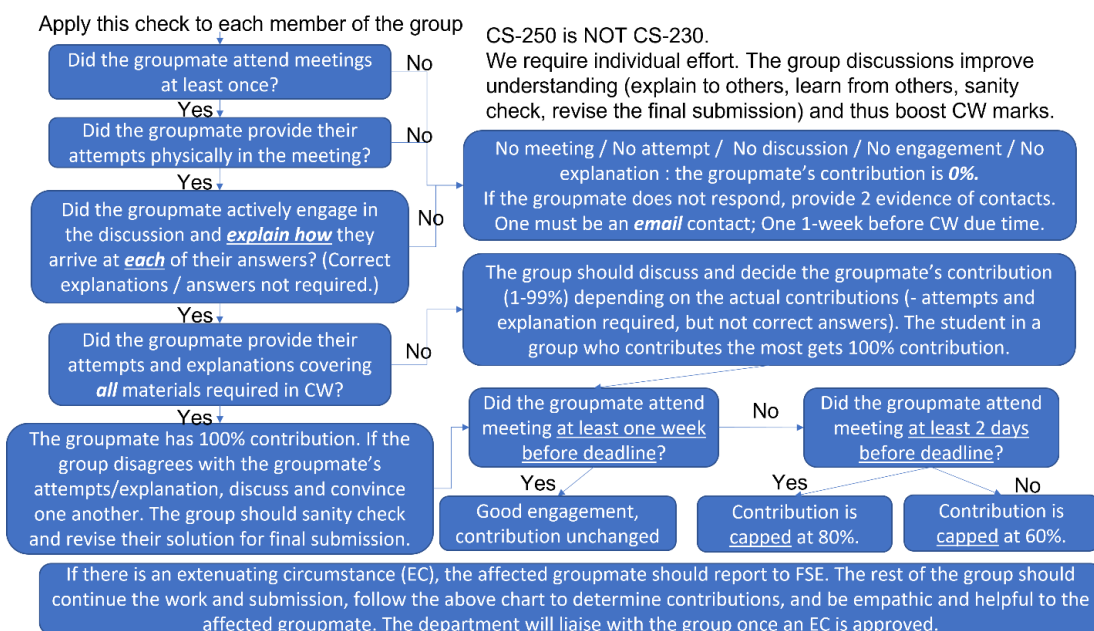
and **Individual contribution (in %)** will be determined according to the guidelines below.

## Guidelines for Handling Unequal Contributions for CW3:

**Caution!** You **should NOT email or share** your work with group members **before** any scheduled meetings (whether physical, via Zoom, Skype, etc.). Additionally, **do not submit** your work to “CW3 (Group)” Canvas link **before cross-checking** it with the group. During meetings, each member must present their attempted work (e.g., physically, through screen sharing, or via video) and actively participate in the discussion. Otherwise:

- If a group member **does not** respond to communications, never shows up, or does not engage, their contribution will be **0%**.  
(Each member is responsible for actively engaging without needing to be asked or chased.)
- If a group member **does not** provide any work for cross-checking, their contribution will be **0%**.
- If a group member provides parts of CW3, but **does not engage in discussion or meet up**, contribution will be **0%**.
- If a group member attends the meeting but does nothing (e.g., sitting silently), or cannot explain their solution or attempted work, it will also be considered non-engagement, resulting in a **0%** contribution.
- If a group member completes some parts of CW3 (**but not all**), actively engages, discusses, and explains their solutions during the meeting, their contribution should be set between **1%** and **99%**. For example, if a student did not complete a particular question, they should receive no contribution credit for that question. However, if they actively contribute afterward, the group **may** consider increasing their contribution. The percentage (%) should be agreed upon by all group members. The student(s) who contribute(s) the **most** will receive a **100%** contribution. You **must speak up** if there are non-contributors. Low contributors should receive a proportionally lower contribution percentage. If all group members agree with the specified uneven contributions, the group does not need to provide evidence. When finalizing the solution in the last meeting, group members should evaluate whether they have contributed less, equally, or more than others. There should be no disputes over higher or lower contributions. However, if there is still disagreement, refer to the evidence/procedures outlined below.
- The coursework is provided with a 4-week timeframe for completion. It is essential to practice good time management skills. All students are responsible for actively engaging with the group and explaining their attempts **well in advance** of the deadline. If a group member only responds or engages in the **last week** (or even the **last 2 days**) before the deadline, their contribution will be capped at **80%** (or even **60%**). These caps are designed to encourage early engagement. Evidence may be required, as detailed below.
- If a group member faces extenuating circumstances, the group must proceed with their submission as planned. All cases of extenuating circumstances will be managed centrally by the department. For instance, if a group member is unable to engage until the last 2 days before the deadline due to illness, the group should continue with discussions, sanity checks, and submissions as previously outlined. Such situations have occurred before, such as being bedbound for 2-3 weeks due to COVID. Please be empathetic during discussions. The affected group member should apply for extenuating circumstances (EC), which will be reviewed by the department. Appropriate actions will be advised to both the individual and the group based on the circumstances.

**h)** All students are required to maintain a record of their individual progress as evidence of their efforts. In cases of disputes concerning coursework marks (e.g., due to plagiarism or an attempt to gain marks without effort), individual group members will need to present evidence of their contributions. Any incidents of academic misconduct will be reported through the official FSE channels. Submit your work progressively to the "CW3 (Individual)" submission link on Canvas, as it will serve as strong evidence of your progress.



### Example contributions:

Eg1: 100%, 100%, 100%, 100%, 100% (Each student did their own work, engaged and cross-checked others.)  
 Eg2: 100%, 100%, 100%, 100%, **0%** (One student did not turn up in any meetings.)  
 Eg3: 100%, 100%, 100%, 100%, **0%** (One student has (been) withdrawn from the course and never responded.)  
 Eg4: 100%, 100%, 100%, 100%, **0%** (One student emailed his/her answers, but not engaged in any meeting.)  
 Eg5: 100%, 100%, 100%, 100%, **0%** (One student only did the formatting and document. 0%! It is not CS-230.)  
 Eg6: 100%, 100%, 100%, **80%**, **60%** (All contribute fully, but one engaged 3 days/another 1 day before due date.)  
 Eg7: 100%, 100%, 100%, **70%**, **40%** (1x contributed partially but engaged actively; 1x partial & late engagement.)  
 Eg8: **20%**, **20%**, **20%**, **20%**, **20%** (Each student did a fifth of the work, and no cross checking. It is not CS-230.)

### Evidence required for Unequal Contribution and Dispute Procedure:

**A)** If your groupmate(s) fail to collaborate, meet up, or respond, the group must present **two pieces of evidence** demonstrating attempted contacts (e.g., emails, Facebook messages, text messages, Slack, Discord) and **append** them to the submission. This evidence will not count towards the page limit. There are strict requirements:

1. One piece of evidence must indicate attempted contact **AT LEAST ONE WEEK** before the deadline.
2. One piece of evidence **must be an email** communication since email serves as the official mode of communication within the university. Students are expected to check their emails at least once daily. If you are unaware of their email addresses, reach out to Gary/TA.

With the provided evidence, your non-collaborating groupmate(s) will receive a **0%** contribution (or be capped at 80/60% for late/very late contributions). However, if the group fails to satisfactorily provide the two required pieces of evidence, a 100% equal contribution will be assumed. In the event that your non-collaborating partner(s) **accuse** you of the same with evidence, each of your coursework submissions will be individually assessed, but all final marks **will be halved** due to the absence of collaboration or discussion efforts. It undermines the purpose of promoting discussion and sanity check, while also needlessly burdening markers with additional efforts such as more emailing, marking, and investigations.

**B)** In the rare event that a dispute arises after the deadline (e.g., due to a student making a last-minute contribution change without the group's consent), the group has the opportunity to notify the markers within 1 day of the deadline. The group will have a period to attempt to reconcile and reach a consensus once more (2 hours). If the issue persists, the markers may use their professional judgment to assess the contributions. Each group member must provide the following evidence to the markers—a lengthy process:

- Your individual work (completed before any meetings),
- Your stated contributions (detailing what you have contributed during the meetings),
- Records of meetings, evidence of discussions, and active engagements,
- Any additional evidence you deem relevant.

Markers (TA and Gary) will cross check the submission history in "CW3 (individual)" and determine the final individual contributions. Our decision will be conclusive.

Frequently, when markers rely on our professional judgment to determine unequal individual contributions, **the outcomes often do not satisfy everyone since markers can only assess the evidence to gauge efforts**. Therefore, it is in your best interest to address contribution issues within the group early on before submission to avoid dissatisfaction with the results.

If there is a lack of discussion or engagement within the group in any of the aforementioned scenarios, which undermines the purpose of the discussion and sanity check, additional marks may be deducted from the **entire group (up to 50%)** as it

places an unnecessary burden on markers (increased emailing, marking, investigation). Furthermore, it is essential for the group to ensure that all members have the chance to freely discuss and contribute. Failure to facilitate this opportunity may result in non-contributing members accusing the group of not allowing them to explain. In such cases, further deductions in marks may be applied as it compromises the intent of the sanity check.

**C)** If the group extensively discusses and agrees on any unequal contributions, clearly specify them at the top of the submission answer sheet (docx). No further evidence will be required in this case.

**FAQ:** Some students wonder, "Are we bad people if we assign no/low contribution grades to non/low-contributors?"

**Answer:** No, this line of thinking is entirely incorrect; in reality, it's quite the opposite.

If high marks are given to non-contributors, it fosters a belief that they can exploit the efforts of others to obtain grades. This mindset can have detrimental effects on their future careers as they may struggle to succeed without putting in adequate effort. Therefore, awarding high marks to non-contributors is ultimately harmful as it fails to make them aware of their lack of effort and its consequences.

Adhering to the principle of "No contribution, no marks. Low contribution, low marks" is crucial. Students should learn to voice their concerns and not hesitate to report non-contributors. Doing so is ultimately for the benefit of non-contributors, helping them realize the importance of active participation and effort.

**FAQ:** Does a bad solution equate to 0% contribution?

**Answer:** No, 1) How can you determine if a solution is bad? 2) Even unclear solutions can spark thought or aid in identifying other errors. The key question is whether the individual and the group actively participated in discussions. Unclear or unexplained solutions may result in lower contributions. The precise assessment of individual contributions is the responsibility of the group.

**FAQ:** Can I work with my group collaboratively?

**Answer:** For **CW3**, you may opt to collaborate with your group (e.g., sitting together at a single workstation or using platforms like Skype/Zoom) to engage in cooperative work. However, it is crucial to ensure that you and your group members contribute equally. Each student within the same group will receive identical marks (100% contribution each). While collaborative work is acceptable, it is ***not encouraged*** for the following reasons:

1. If you only complete a portion of the work, you may miss out on important learning opportunities, which could significantly impact your performance in the final exam.
2. Without thorough cross-checking, each group member may only contribute a fraction (e.g., 20%) to the coursework.
3. Collaborative solutions may overlook errors or issues as there is no independent sanity check.
4. Working collaboratively may hinder your ability to identify, learn from, and rectify mistakes made by others, limiting your grasp of the subject matter.
5. Assigning tasks like formatting and documentation to a single groupmate without engaging in the core concepts of CS-250 is detrimental. In such cases, minimal to no contributions should be allocated to that individual. We are not CS-230.
6. It is essential to be aware of your groupmates' capabilities. In many instances, group members may not be responsive, resulting in an unequal distribution of workload, especially in courses like CS-230. In contrast, CS-250 emphasizes individual effort. It is advisable to complete your work independently initially and avoid dependence on others.

**FAQ:** What if my groupmate responds very late?

**Answer:** The coursework is intended to be completed individually. It is essential to conduct thorough cross-checking and apply a sanity check to rectify any careless errors. Engaging in discussions, whether early or late, aids in better absorption of the material. If a groupmate contributes less, their input should be prorated (1-99%, as mentioned above). In cases where a groupmate responds late, such as in the final week or just days before the deadline, their contributions should adhere to the prorating rule. If their efforts do not encompass all the required materials or lack explanations, their contribution may fall below the cap, even reaching 0%.

**FAQ:** What if none of my groupmates respond one week before the deadline?

**Answer:** This situation is rare as there are 5 students in a group. If none of your groupmates respond one week before the deadline, it is crucial to retain evidence and promptly report this situation to Gary/TA. We will investigate the matter. However, if you only inform us in the last few days before the deadline, it may be too late to take effective action.

**FAQ:** What does the term 'sanity check' refer to in this context?

**Answer:** The term "sanity check" refers to a process in which individuals or a group review each other's work to ensure that they are logical, reasonable, and free from obvious errors. In the context of academic coursework or a group project, a sanity check involves verifying the accuracy and coherence of one's work by discussing it with others, typically group members. This practice helps in identifying and correcting any careless mistakes, inconsistencies, or misunderstandings before final submission. By conducting a sanity check, the group can validate the soundness of their work and enhance the overall quality



of their output through collaborative scrutiny and feedback, and thus higher marks. Achieving a perfect answer necessitates multiple checks. Involving your groupmates accelerates and streamlines this process.

**FAQ:** What should I expect from participating in a group discussion?

**Answer:** The coursework is designed for **individual** completion. Group discussions facilitate better absorption of materials, while the sanity check is instrumental in rectifying careless mistakes. It is crucial not to anticipate correct answers or significant contributions from groupmates. Instead, actively contribute and engage with your peers. Even if a groupmate's contributions are minimal, it is beneficial to involve them in discussions and explain your answers. A simple "why?" from a groupmate can prompt you to reassess and confirm your answers. By explaining or confirming your answers in a different manner, you not only acquire a new perspective on addressing the question but also enhance your comprehension and may identify errors that require revision. This process encapsulates the essence of "discussion and sanity check," emphasizing the concept of "Teaching to learn," where giving explanations is more enriching than merely receiving answers. Non-contributors, who do not engage, provide results for cross-checking, or fail to explain their attempts, should rightfully receive 0% contribution credit. The presence of at least one groupmate during the sanity check serves the intended purpose effectively.

**FAQ:** What if I want to work with someone else / What if I know no one to work with?

**Ans:** The CW assumes individual effort. The purpose of groupwork is for sanity checking, spotting careless mistakes and absorbing materials better through discussion. You can thus sanity check with **any groupmate**. It is **NOT** the duty of the instructors to form groups for you with specific students. Yet, to be flexible, we will follow these procedures:

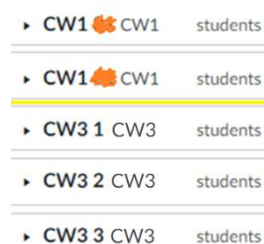
On **Oct 22**, CW is released. Empty CW2 groups (each requires 5 groupmates) are created where anyone can join. If you want to form group with someone, feel free to do so. The instructors will not help you form group. Instead go to the Canvas > "people" page > Groups (scroll to the bottom of the page and skip any CW1 groups, see right figure) and leave/join/switch CW2 groups if necessary.

Read: <https://community.canvaslms.com/t5/Student-Guide/How-do-I-join-a-group-as-a-student/ta-p/468>

On **Oct 29**, students not in a group will be randomly assigned a group. This promotes early engagement. You can still leave/join/switch groups if necessary. But **you should seek consent of all the affected members/groups yourself and change (leave/join/switch to) the groups yourself on Canvas**. Instructors **will not respond** to any group change requests. It is your duty to ensure you are in the right group on Canvas.

On **Nov 5**, if you were found to be not in a group, the instructor will **randomly assign** you into a group. All grouping will be fixed on this date, and no changes will be allowed. You must then work with your **new groupmates even though you may have been working with someone else**. It is to ensure that everyone has at least two weeks to work with their groupmates and sufficient time to engage. In the exceptional case where you have genuine reasons to do the coursework individually, you must seek approval from the instructors and provide satisfactory evidence (e.g., medical certificate).

**Note:** Students often wish to change groups for CW3. Therefore, CW1 groups will not be carried over. If you'd like to continue working with your CW1 group, please coordinate with your groupmates to form a new group for CW3.



The screenshot shows a list of groups in Canvas. The first two groups are CW1, each with an orange icon and labeled 'students'. The next three groups are CW3, labeled '1 CW3', '2 CW3', and '3 CW3', each with a blue icon and labeled 'students'. The CW3 groups are highlighted with a yellow background.

▶ CW1	CW1	students
▶ CW1	CW1	students
▶ CW3 1	CW3	students
▶ CW3 2	CW3	students
▶ CW3 3	CW3	students

**FAQ:** What if I enrol late and is not assigned a group?

**Ans:** Please contact Gary. You will be assigned into a group. This rarely happens in CW3.

**FAQ:** Does the group need to submit anything to Canvas one week or two days before the deadline?

**Answer:** No, the group doesn't need to submit early. You can submit your group work anytime before the deadline, and once submitted, all groupmates will be able to see the submission. The one-week (80%) and two-day (60%) contribution caps are designed to encourage early participation. If a member contributes only in the last week or two days, please adhere to the unequal contribution guidelines mentioned above.

You must submit your individual attempts for CW3 through the 'CW3 (Individual)' link as early and frequently as possible to track your progress. These submissions may be reviewed by the academic misconduct team as evidence of your contribution. If you do not submit anything for 'CW3 (Individual)', you will receive zero marks for CW3. Ensure your work is solely your own. Group work, after discussion and sanity check, must be submitted via the 'CW3 (Group)' link.

## General Notes and Advice

**Clarification** We have tried to provide all the information you require to complete this coursework. If you think some information is missing or not clear, you can ask instructor to clarify (preferably by email).

**Late Submission** Standard University and Faculty of Science and Engineering (FSE) rules apply for late submission, i.e., **zero** if handed in late.

**Extenuating circumstances (EC)** If you have extenuating circumstances, please follow the FSE procedure for requesting a penalty waiver and provide satisfactory evidence.

- Submit all applications through the [University Extenuating Circumstances System](#).
- [Extensive guidance](#) is available, and email [studentsupport-scienceengineering@swansea.ac.uk](mailto:studentsupport-scienceengineering@swansea.ac.uk) for more information.

Instructors cannot authorize late submissions; all requests are reviewed centrally on a case-by-case basis. Students should also inform the instructor and proceed with their submission. Those affected (student/group) will be informed of the appropriate actions subsequently. Extenuating circumstances should be raised as soon as possible, ideally before submission or within 5 days after the deadline, as per FSE rules. Generally, no circumstances will be accepted after this period unless you face serious issues, such as being bedridden in the hospital. All claims are subject to verification by the FSE.

## Academic Integrity and Misconduct

**Important:** You are expected to submit your own work for this coursework.

### Academic Integrity and Academic Misconduct Statement

By submitting coursework, electronically and/or hardcopy, you state that you fully understand and are complying with the University's policy on Academic Integrity and Academic Misconduct. The policy can be found at <https://myuni.swansea.ac.uk/academic-life/academic-misconduct>. The consequences of committing academic misconduct can be extremely serious and may have a profound effect on your results and/or further progression. The penalties range from a written reprimand to cancellation of all of your marks and withdrawal from the University.

When working on coursework and projects, discussing issues with lecturers or classmates is acceptable. However, you must cite any assistance received in your submission; failure to do so will be considered plagiarism. You are responsible for understanding and explaining all solutions submitted. The instructor will pursue any suspected plagiarism or collusion through official university channels. Keep a record of your work until CS-250 is completed, as you may need to demonstrate your contributions in cases of suspected plagiarism.

**Tips:** MySQL / PhpMyAdmin have a utility to import data to the database, and this will most likely be the easiest way for you to get the data into the system. If you have any problems with this, please contact instructor early. No help will be provided if you leave it until the last week of the coursework deadline. If you cannot complete any one of the problems, you should at least make some attempts and perhaps explain your approach to getting the solution so that partial marks can be awarded.

## CS-250 CW3 Advice from past years' students

*Form group early*

*Group member is important*

*(Gary: you can form groups, and be randomly assigned.)*

*Read the Lab materials, it helps "A LOT"!*

*Read loads of examples before trying PHP.*

*Earn all effort marks to boost your marks.*

*(Gary: remember to do the evaluation too : ) )*

*Review lecture and tutorial notes.*

*Lots of problems with XAMPP - start early.*

*PHP is hard, but good fun.*

*(Gary: PHP is fun and is the easiest among all.)*

*Work on the presentation early on.*

*PHP: Define action plan, split task into manageable pieces.*

*(Gary: Suggest that you do your own work, and cross check.)*

*Ask questions on discussion board early.*

*Have at least 2 face-to-face meeting with partners.*

*(Gary: I expect more than that.)*

*Crop essential parts from screenshots to save space...*

*Make good use of all whitespaces.*

*(Gary: Observe the minimum font size limitation.)*

*Start the coursework really quickly, by that we mean really really quickly!*

*(Gary: this group scores 97%.)*

*Engage in group discussion. The group coursework helped me know more people on the course, and interact with others who understood more.*

*In general, you must not under-estimate the CW3 workload – it is 10% of CS250!*

*You may need time to get familiar / revise lecture and tutorial materials before attempting CW3.*

*Further, CW3 requires preparation time (e.g. setup XAMPP, try out MySQL, do Self-Lab1-4).*

*We have covered all these in lectures and tutorials, and you should try them practically (See the Lab Materials folder).*

*If you have somehow skipped any lectures / tutorials, make sure you catch up the materials yourself without delay.*

*If you have not installed XAMPP, remember to try it early. If there are problems, come to XAMPP optional Labs.*

*Act now.*

*(Again, how to eat an elephant?)*

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This coursework contributes 10% of the assessment for module CS-250. You are given the opportunity to develop practical experience on SQL and PHP implementation. Based on the feedback from past year students, CW3 has been separated from CW2 and is associated with a separate new deadline.

SQL+PHP (Hand-ons) (worth 10% of CS-250)



There are two tasks in CW3. You will use SQL knowledge to help Gifftretail.co.uk (management team) to answer some simple questions regarding their online sales database, and to help generate an invoice page.

This part gives you practical opportunities to write SQL queries of a large database. Full marks can only be obtained if you demonstrate clearly that you have tested the queries on an actual implementation of the database.

You will use the online Retail Gift-ware database (the same database used in CW2 Problem 21-25). Again, all test data is randomly generated, and *all data is fake* - they are for testing purposes only. Data is provided to you in the form of text/sql files and can be downloaded from Canvas. Read CW2 for the descriptions of attributes and tables.

In Task 1, you will answer questions for Gifft management team by formulating the necessary SQL queries. In Task 2, you will use SQL+PHP knowledge to help Gifft management team to generate an invoice page.

Task 1 (SQL) (@60):

You are required to provide *one single* SQL statement to answer each of the questions. Present your answer concisely:

- a) Show the SQL statement(s) you used and
- b) The results obtained from your database (e.g., copy results or screenshots from console / PHPMyAdmin).

Important Notes:

- you *must* use a SQL formatter to syntax highlight and tidy up your SQL statements (say using <http://www.dpriver.com/pp/sqlformat.htm>, or <https://poorsql.com/>)  
The look and feel should resemble that of the SQL queries in Problem 17-19 of CW2.
- you *must* observe the font size limit. This applies to all screenshots, figures and tables. Otherwise, marks will be deducted for poor presentation, or no marks will be given if it is incomprehensible.
- You must *NOT* use *NATURAL JOIN SQL keyword* in any of the following questions.  
(To put it simply, if your SQL statement contains the word “*NATURAL*”, *NO* marks will be given.)
- You should observe *further constraints* in each of the questions below.

**Question 1.** A *Discount* is the difference between the total cost of all items ordered and the amount actually paid by the customer, provided the amount paid is less than the total cost. If a discount exists (i.e., the customer paid less than the total cost), retrieve the invoiceid, customername, and the discount amount. Display the results in descending order of the discount values. If multiple discounts have the same value, their order of appearance does not matter.

You should show a table that looks like below:

invoiceid	customername	discount
...	...	...

Your *one single* SQL statement should contain *at most* one *FROM* keyword. Otherwise, 50% marks will be deducted. (@20)

**Question 2.** A **regular buyer** is defined as a customer who makes more than 10 purchases. Define “**TotalItems**” as the total number of items a buyer has ever purchased across all his/her invoice records. Find the customerid and TotalItems of the regular buyer(s) who have purchased the fewest TotalItems. If there are multiple such regular buyers, your query should display them all. The result should be presented in a table as shown below:

customerid	TotalItems
.....	.....

Write only one single SQL statement. It cannot contain **RANK**, **DENSE\_RANK**, **ROW\_NUMBER**, **ORDER**, **VIEW**, **WITH**, **TOP**, **ASC**, **DESC**, **IN**, **MIN**, **MAX**, **ALL**, **ANY**, **SOME**, or **LIMIT** keywords. Otherwise, **NO** marks will be given. Further to this, if you use more than 2 **SELECT**, 25% marks will be deducted. More than 3 **SELECT**, **NO** marks will be given. **(@30)**

**Presentation** The remaining 10 marks will be awarded for clear presentation. **(@10)**

## Task 2 (SQL + PHP) (@40):

Your final task is to generate an Invoice for Gifftretail.co.uk that looks as closely as possible to the ones below using PHP, *given an invoiceid* (to be submitted from a form textbox). See the two figures below.

The invoice should show the invoice details, shipping address, payment method and item details.

In the invoice details section, the receipt should show the total(s) and discount/refund (if there is any).

**Discount** – customer paid less than s/he should.

**Refund** – customer paid more than s/he should.

If no discount or refund is applied, the invoice page should **not** display any discount/refund information.

As a competitor to traditional brick-and-mortar retail stores, Gifft offers free shipping to all customers.

In the item details section, all items and their quantities should be listed, with no specific order required for the items. The total number of items purchased must also be indicated.

To show that you have done this part, you should submit the following:

- 1) PHP code that you wrote (only one php file, called *gift.php*. Also see FAQ below.)
- 2) Screenshots of **three** invoices with different invoiceids. One of the invoiceids must be chosen from the results of Question 1 of Task1.

**Remember, CW3** submission allows only one PDF file. You should convert your php file and screenshots into pdf and append it to the submitting pdf in Task1 (Read SoftSkills), respecting the page limit.

*Note:* your SQL must use the set of tables that was created in CW2 problem 21-25.

**Strong Tips:** *Nested HTML tables are all you need! Don't waste time on fancy CSS styles or layout.*

*If you insist, it is okay to use CSS only if you feel comfortable, but we find that it wastes lots of time. This part does not require CSS. Nested HTML tables are fast and easy. You are warned.*

**FAQ:** All my PHP code is returning the correct values, but my form has different padding and border colours etc. Do we have to stick to your styling conventions?

**Ans:** The record cards should be as close as possible to the one we provide, including the style.

In terms of style, slight differences are acceptable, e.g.

It is fine 1px padding <=> 3px padding, but the padding should be there.

Same for borders 1px <=> 2px are fine, but the border should be there.

Same for color: red <=> dark red / light red should be fine.

**FAQ:** What is syntax highlighted PHP code?

**Ans:** Read [SoftSkills](#).

**FAQ:** My receipt is very long... making the font size small...

**Ans:** Choose another example.

**FAQ:** My receipt is very wide... making the font size small...

**Ans:** Do not press screen capture button. Instead, crop the image in Word, and/or reduce the size of your browser first, then “Alt+PrintScreen”.



That is "giff.php" should be the form handler and be observed in the PHP code. Read and modify the last example in PHP lecture (i.e., artist.php).

2) If you are unsure, you can **always** cite the source (giving credits to the source).

---- End of CW3 ----