INTRODUCTION TO INFORMATION TECHNOLOGY

Tutorial Questions

TUTORIALS

During tutorials you will be working in learning groups of around 5-6 people. Your tutor will spend time with each group, assisting as necessary to ensure that you are on the right track. You should discuss and work actively together to ensure that everyone fully understands the subject material. In some tutorials you will have specific exercises to do; these are designed to assist you in mastering the various skills and concepts. Tutorial time can also be spent discussing assignments and labs as well as material from lectures or the textbook.

After each week's tutorial, it is a very good idea to write out the complete solutions to the problems set that week, particularly as for some tutorials your group may not complete all the problems in class. This means that you can commence the following week's class with a brief discussion of the solutions, possibly by asking your tutor for feedback on your written work. Such regular clarification of your own understanding of the topic is the best form of preparation for the final exam.
Week 1 Tutorial: Group formation

Aim

The aim of this tutorial is to initiate your learning groups, and to introduce you to the broad range of information technology.

Formation of learning groups

An important aspect of studying at university is learning to work in a group, as well as learning by working in a group. The learning group is not intended to be a way of distributing parts of a problem to individuals; it is intended to be a forum for discussion where group members can assist each other in the process of learning. It is important that both before and after tutorials you spend time individually doing the exercises and ensuring that you fully understand the material. Doing this will also enable you to more effectively contribute to your group (for which you will receive marks towards your final grade).

The role of your tutor is to facilitate discussion within your learning group and provide general recommendations for ways you might solve the problems. This will mean that your learning group, not the tutor, will determine what concepts to devote more or less attention to.

It is important to regularly attend tutorials in order to be able to participate in learning group discussions. It is also important to get to know the members of your learning group so that you feel comfortable both making suggestions about how problems might be solved and asking others for their suggestions.

Participation in the learning group will contribute to your assessment. Further details can be found after the questions for tutorial 12. You will also be asked to make preliminary assessments of each other during the semester.

The first exercises for this tutorial is to get to know the members of your learning group.

Interview

Form pairs (with one group of three if you have an odd number of group members) and each member interview the other for 5 minutes. Establish the following information:

- your partner's name
- one of the advantages of attempting to solve problems as a group
- one suggestion as to an advantage of learning about information technology
- one other question determined by the entire group

Present the other member of your pair together with your summary of their experience of working as part of a team to the rest of the group for approximately 5 minutes.

Name Game

The object of this exercise is to ensure that you know the names of the members of your team. Your tutor will give you a ball, or if not, scrunch up a piece of scrap paper. For about 10 minutes, throw the ball to a member of your group addressing them by name.
Every group member should have thrown the ball to every other member of the group at least once.

**What is IT?**

1. What exactly is information technology? What kinds of topics would you expect to cover in this course? What topics would you consider essential for this course? (i.e. what topics must everyone who passes this course know?)
2. I am interested in politics, so information technology is completely irrelevant to me". Describe at least three counterexamples to this statement. (Hint: think about the topics covered in the first couple of lectures ...).
3. How would skills in information technology help you with a career in the movie industry?
4. Name and describe at least four applications of robots.
5. The Internet might have killed the CD industry, but that is the only influence of IT on music in general". Do you agree or disagree? Why? Back up your answer with some evidence.
6. What is the TREC legal track? Who is Doug Oard? And where is he located until June 2010? (You probably won't be able to answer this in the tutorial unless one of your groups has a working Internet connection).

**Outcome**

At the end of the tutorial, please hand to your tutor a list of names and student numbers for the people in your group (as well as group name, if you wish). Fill in the tutorial summary sheet as best you can, including the group's assessment of how well each person has worked in the group.

**Reflection**

What are the boundaries of IT? Under what circumstances would you say that a given issue is not about IT? How would you write down one sentence that describes your understanding of what IT is?
Tutorial 1 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
# Tutorial Group List

**Group Name:**

**Group Members:**

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Week 2 Tutorial: Images

Preparation

You are expected to have read Topic 1 Chapters 2 and 3 of the textbook (pages 26-96).

Aim

The aim of this tutorial is for you to become familiar with how images are stored in computers.

Questions

Attempt questions 1 - 26 from Topic 1, page 55 - 57.

Reflections:

How could you ever trust a photograph, given that these can be easily edited nowadays? Should photographs be banned as evidence in a court? Or is there a certification process that could ensure no tampering has taken place?
Tutorial 2 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 3 Tutorial: Images

Preparation

You are expected to have read Topic 1 Chapters 2 and 3 of the textbook (pages 26-96).

Aim

The aim of this tutorial is for you to become familiar with how images are processed in computers.

Questions

Questions 1-13 of the Review Questions from Topic 1 Chapter 3, pages 94 - 96.

Reflections:

"It used to be that photographs were put into old boxes and never organised into photo albums. Now photographs are put onto hard discs and never organised into slideshows. Nothing has changed, only the technology we use to waste our time and resources."

Do you agree with this statement? How might there be a technological solution to this problem? (Hint: what is your screensaver?).
Tutorial 3 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 4 Tutorial: Audio

Before this tutorial you are expected to have read Topic 1 Chapters 4 and 5 of the book (pages 102 - 155).

Aim

The aim of this tutorial is for you to become familiar with how audio files are stored in computers.

Questions

Questions 1 - 20 of the Review Questions from Topic 1 Chapter 4, pages 120 - 121.

Reflection

It was once common to purchase CDs and other physical storage media to obtain recorded music. What are the advantages and disadvantages of purely electronic distribution? How might the disadvantages be overcome?
Tutorial 4 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 5 Tutorial: Digital Video

Before this tutorial you are expected to have read Topics 1 – Chapter 6. Pages 158 – 201 of the textbook

Aim

The aim of this tutorial is for you to become familiar with how video files are stored and processed in computers.

Questions

Questions 41-73 from pages 197-201 of Chapter 6

Reflection

The comic book hero `The Phantom' is sometimes referred to as `moving faster that the eye can see'. Isn't this exactly what computers do now to display videos?
### Tutorial 5 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 6 Tutorial – System Fundamentals - 1

Preparation

Before this tutorial you are expected to have read Topic 2 Chapter 1 of the book. – Pages 206 – 258 of the textbook

Aim

The aim of this tutorial is to give you some experience with how information is stored and processed in binary form in computers.

Questions

Questions 1-7 on pages 212 - 213 (Topic 2, Chapter 1)
Questions 1-6 on page 223 (Topic 2, Chapter 1)
Questions 1,2,5-10 on pages 230 - 231 (Topic 2, Chapter 1)
Questions 4,5 on page 236 (Topic 2, Chapter 1)

Reflection

It has been said that computers could run more efficiently if they were based on hexadecimal numbers, rather than binary ones. Why would this be? What would be necessary to make this idea work?
Tutorial 6 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 7 Tutorial, System Fundamentals 2

Preparation

Before this tutorial you are expected to have read Topic 2 Chapter 1 of the book. Pages 206 - 258

Aim

The aim of this tutorial is to give you some more experience with how information is stored and processed in binary form in computers.

Questions

Questions 1-4 on pages 242-243 (Topic 2, Chapter 1)
Questions 1-4 on page 248 (Topic 2, Chapter 1)
Questions 1-7 on pages 254 (Topic 2, Chapter 1)
Questions 1-6 on page 258 (Topic 2, Chapter 1)

Reflection

Compression is only possible when there is redundant information stored. Why does this happen?
Tutorial 7 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 8 Tutorial, Operating systems 1

Preparation

Before this tutorial you are expected to have read Topic 2 Chapter 2 of the book. Pages 268 - 299

Aim

The aim of this tutorial is to give you some understanding of how programs are executed on computers.

Questions

- Questions 1,2,3 on page 271 (Topic 2, Chapter 2)
- Questions 1-10 on pages 289 - 290 (Topic 2, Chapter 2)
- Questions 2,3 on page 296 (Topic 2, Chapter 2)
- Question 3 on page 299 (Topic 2, Chapter 2)

Reflection

Why is computer programming considered very error prone? Is all that detail strictly necessary?
# Tutorial 8 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 9 Tutorial, Operating Systems 2

Preparation

Before this tutorial you are expected to have read Topic 2 Chapter 3 of the book. Pages 308 - 332

Aim

The aim of this tutorial is to develop your understanding of how operating systems work.

Questions

Questions 1-4 on page 312 (Topic 2, Chapter 3)
Questions 1-4 on page 320 (Topic 2, Chapter 3)
Questions 1-5 on page 323 (Topic 2, Chapter 3)

Reflection

Why isn’t there just one operating system? Why aren’t there dozens of them? How come there are really only three?
Tutorial 9 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 10 Tutorial, Operating Systems 3

Preparation

Before this tutorial you are expected to have read Topic 2 Chapter 3 of the book. Pages 308 - 332

Aim

The aim of this tutorial is to further develop your understanding of how operating systems work.

Questions

Questions 1-4 on page 328 (Topic 2, Chapter 3)
Questions 1,2,3 on page 332 (Topic 2, Chapter 3)

Reflection

Sometimes users want to do things that aren’t good for them. How far should an operating system go to try to protect a user from themselves?
Tutorial 10 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 11 Tutorial, Networking and The Internet

Preparation

Before this tutorial you are expected to have read Topic 2 Chapter 4 of the book. Pages 338 - 383

Aim

The aim of this tutorial is to give you some understanding of how the Internet works.

Questions

Questions 1-5 on page 348 (Topic 2, Chapter 4)
Questions 1-5 on page 357 (Topic 2, Chapter 4)
Questions 3,4 on page 374 (Topic 2, Chapter 4)
Questions 1-5 on page 383 (Topic 2, Chapter 4)

Reflection

“The Internet has been the most fundamental change during my lifetime and for hundreds of years.” Rupert Murdoch. Do you agree or disagree with this statement?
Tutorial 11 Summary Sheet

Summary of outcomes:

Questions solved:

Questions attempted but unfinished:

Questions not attempted:

Points to raise with tutor or lecturer:

Peer and self assessment: (see the final tutorial for mark guidelines)

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Other Comments:
Week 12 Tutorial

Preparation

Before this tutorial you are expected to should prepare a short comment on each group member, including themselves, and assign a mark to each person. Look through records of tutorials to remind yourselves of who contributed what. Make the comments (positive and negative) as specific as possible. It is much more useful for everyone if you state specific things that a person does well, and specific things they could improve on, rather than making a fairly generic comment.

You must bring 2 copies of your preparation to the tutorial. One copy should be handed to your tutor at the beginning of the tutorial.

Aim

To determine final peer and self assessments for your group, and for you to reflect what you have learnt about IT, and what trends you can identify for the future of IT.

Some questions for further discussion.

1. “Nowadays, anyone who cannot speak English and is incapable of using the Internet is regarded as backward.” Al-Waleed bin Talal. What will be considered “backward” in this sense in say five years time?

2. In principle, VoIP and similar developments should make telephone lines redundant, but they still persist. Will this continue? Or will landlines become as redundant and forgotten as floppy disks?

3. What will computers look like in ten years time? Will it be likely that an assistant will ask a customer purchasing software “Would you like hardware with that?”

4. Under what circumstances would you fly on a plane which was flown solely by robots and/or computers?

5. Worms, trojan horses and other malware remain a problem. Will we ever be rid of these?

Peer and Self Assessments

The learning groups form an important part of the learning process. The ability to work in a group towards shared understanding of complex problems is an increasingly important ability. It is also of important to be able to assess the contributions of oneself and one's colleagues in a professional manner. The members of the group are in the best position to be able to judge fairly and accurately how much each person has contributed to the task of developing group understanding of the 259 subject matter.

It is important to realise that contribution to the learning of other group members can take many different forms. E.g.:
• Reading and sharing information - both technical content and judgements as to what is worth reading.
• Explanation of things not understood. Here it is important not to just tell someone the answer, but to explain it so that the other group members learn and understand, and able to apply that knowledge to other problems as well.
• Suggesting a solution which is examined by the group.
• Going through someone else's solution in detail and finding problems with it.
• Comparing one solution to another and identifying points of difference.
• Asking questions - showing what is not understood. In this case it is important to have done some preparation beforehand, so that it is not simply a matter of saying "I don't understand this" because you have never seen anything like it before, but to have attempted to understand before the tutorial and to have some understanding of what it is that is understood and what is not.
• Sit together in the lab and help with problems. Here it is important to consider not just the help per se, but whether the assistance given helped someone else to learn. In other words, did X help Y learn or just help Y get the assignment done?

Mark Guidelines
These are some guidelines for assigning marks in the self and peer assessment.

Suggested grades:

NN - Has mostly not attended and has made little useful contribution.
OR
Has attended sporadically and made some contributions to group understanding and learning. However contributions have not been of sufficient significance to counterbalance poor participation.
OR
Has attended relatively regularly but has mostly been passive, making little contribution to the group's learning.
PA - Has made some genuine efforts to participate and assist all members' learning
CR - Has made some useful contributions to the group, either by regular attendance and participation in tutorials or by some other means
DI - Has made significant and useful efforts to assist group learning, either in a steady, regular manner or somewhat irregularly but very helpful when present
HD - Has taken a consistently active role in developing better understanding within the group - note that this can just as easily be by preparing and asking specific questions as by giving explanations.

A good mark for this aspect of assessment is not primarily to do with having a good understanding oneself.

Once you have determined a grade, use the following table to establish a corresponding mark out of 20.

NN 0-9
PA 10-11
CR 12-13
For the NN case, you should use the range 0-5 for the first case, and 5-9 for the other two.

**Process**

First you should review the quality of tutorial work handed in by group members over the semester. This will provide an indication as to how successful you were as a group in helping each other master the material. This will provide some of the information for deciding your marks. Make a summary for your tutor of how well group members went in doing the tutorial questions.

Next you should go through each person's comments and marks for each other person. The person being assessed can ask for clarification of comments but may not argue or defend themselves - they have an opportunity to make their own comments on their performance in the form of the self-assessment.

If there are differences of opinion as to an individual's level of contribution this should be discussed until the group reaches consensus agreement. If consensus cannot be reached the differing viewpoints and marks should be noted, along with information as to who held what view. It is NOT acceptable just to average out the mark. If this is done all members of the group will have their mark decreased.

Once agreement has been reached regarding an individual, the mark should be noted and some information recorded justifying this mark.

When marks have been recorded for all members, the marks should be reviewed as a whole to ensure that relative differences seem appropriate. E.g. if X has 13 and Y has 14 you should consider in the light of the full picture whether this relative difference seems right. Any adjustments that you wish to make at this stage should be noted following your original list of marks and comments. You should also ensure that the marks are appropriate given "evidence" (the tutorial work handed in).

Make a final list of marks.

Hand in the group's material - i.e. the summary of quality of individual work handed in over the semester, the original marks you gave each other and justifications made during the process, plus any adjustments you wish to make at the end. Put a list of the final recommended marks at the end.

**Outcome**

Fill in the tutorial summary sheet as best you can, including the group's assessment of how well each person has worked in the group.

Hand a list of marks, with justifications, that the group has decided on to your tutor.

**Reflection**

Information technology is constantly evolving, and it is likely that some of the things that you have learnt will be obsolete by the time that you graduate. How will you be able to recognize these? Can you identify some likely possibilities now?
Final Summary Sheet

My Name: ......................................

Student Number: .............................

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Other Comments: