

EXAMINATIONS — 2007

END OF YEAR

COMP311

User Interface Design

Time Allowed: 3 hours

Instructions: Answer all questions.
Total marks are 180.
Use the marks for each question as a guide to how much time you should spend on it.
No calculators are permitted.
Paper dictionaries for translating between English and a foreign language are permitted.
Electronic dictionaries are not permitted.

Questions	Marks
1. General Knowledge	[30]
2. Usage-Centered Design	[35]
3. Evaluation & Testing	[40]
4. Visual & Interactive Design	[20]
5. World Wide Web	[30]
6. Advanced Technologies	[25]

Question 1. General Knowledge

[30 marks]

(a) [4 marks]

What is an *essential use case*?

(b) [6 marks]

Lockwood and Constantine identify five usability rules. Three of these rules are *access*, *support* and *context*. Identify and define the other two rules.

(c) [6 marks]

Compare and contrast *user roles* and *personas*.

(d) [8 marks]

Compare and contrast *User-Centered Design* and *Usage-Centered Design*.

(e) [6 marks]

Discuss two difficulties that arise when designing web-based interfaces, and that are a result of the user having control over the browser the interface is displayed in.

Question 2. Usage-Centered Design

[35 marks]

Consider the following scenario:

Kelburn City Council want to place kiosks all around Kelburn that contain useful community information for visitors and residents alike. These kiosks will act as an information portal for Kelburn, allow users to book tickets for certain events, act as a community noticeboard, and even allow users to log in to access a personal calendar of events and exchange simple plain text emails.

Information Portal

The information portal should contain a map of the Kelburn area, with the key locations such as Kelburn University, Kelburn Stadium (home of the Kelburn Thundercats), Kelburn Opera House (doubling as the home of the Kelburn Symphony Orchestra), and Kelburn Cinemaplex clearly marked. The information portal should also list all the major events that are occurring in the next six weeks, and any important council notices.

Booking Tickets

The kiosk will have a card reader attached, and users should be able to book tickets for any advertised event using their credit card (assuming there are still tickets available). The kiosk will have a network connection to all major banks, so that users can use their pin numbers to verify that they are the legitimate credit card holder.

Calendar and Messaging

Users can register usernames and passwords with the system, that can be used to privately access and maintain a personal calendar of upcoming events, and to access and send private messages to other registered users.

The calendar should automatically include all events that the user has booked through the kiosk, and the user may also add one-off events at a particular time and with a simple text description.

The private messages do not need to support multimedia or file attachments, although the messaging sub-system should support languages other than English.

Community Noticeboard

Users should be able to add and view community notices to a community noticeboard. Users will need to use their registered username and password to perform this action. Community notices need only be plain text, although there should be the ability to associate one of several predefined icons with the notice (such as: entertainment, political, sport, fundraiser, educational, or social). Users should be able to view the community noticeboard, and filter by date range or by type (i.e. by icon).

(a) [12 marks]

Draw the user role map and the use case map for the system described above.

(b) [5 marks]

Identify the focal user roles and the focal use cases from those created in your answer to part (a).

(c) [10 marks]

Select two of the focal user roles and two of the focal use cases identified in your answer to part (b), and write their user role descriptions and their use case descriptions.

(d) [8 marks]

Describe the typical relationship between use cases and interaction spaces. In your description, you should also discuss a possible justification for wanting this relationship to hold.

Question 3. Evaluation & Testing

[40 marks]

(a) [10 marks]

A heuristic evaluation involves using guidelines to identify problems in a proposed interface. The evaluation is performed by considering each task, and then each window and dialog. Jakob Nielsen has proposed the following ten guidelines:

1. Simple & Natural Dialogue.
2. Speak the Users' Language.
3. Consistency.
4. Minimising Memory Load.
5. Good Error Messages.
6. Preventing Errors.
7. Feedback.
8. Clearly Marked Exits.
9. Help & Documentation.
10. Shortcuts.

Use these ten guidelines to identify any usability problems in Eclipse's Preferences window shown in figure 1 on the next page.

(b) [6 marks]

The *essential efficiency* metric measures how closely a design matches the tasks documented in the use cases, by comparing the *essential steps* to the *enacted steps*. Define the terms *essential steps* and *enacted steps*.

(c) [8 marks]

What are two advantages and two disadvantages to using real users in testing interfaces compared to doing a heuristic evaluation?

(d) [4 marks]

What was the problem with AOL releasing search data logs (with the usernames switched for supposedly anonymised numeric IDs) to the wider community in 2006?

(e) [6 marks]

In "Protecting People from Phishing", Kumaraguru et al. used standard security notices as the intervention for one of their three user groups. What was the purpose of using this group in the experiment, and why did the security notices fail?

(f) [6 marks]

Contrast a within-subjects experiment to a between-subjects experiment.

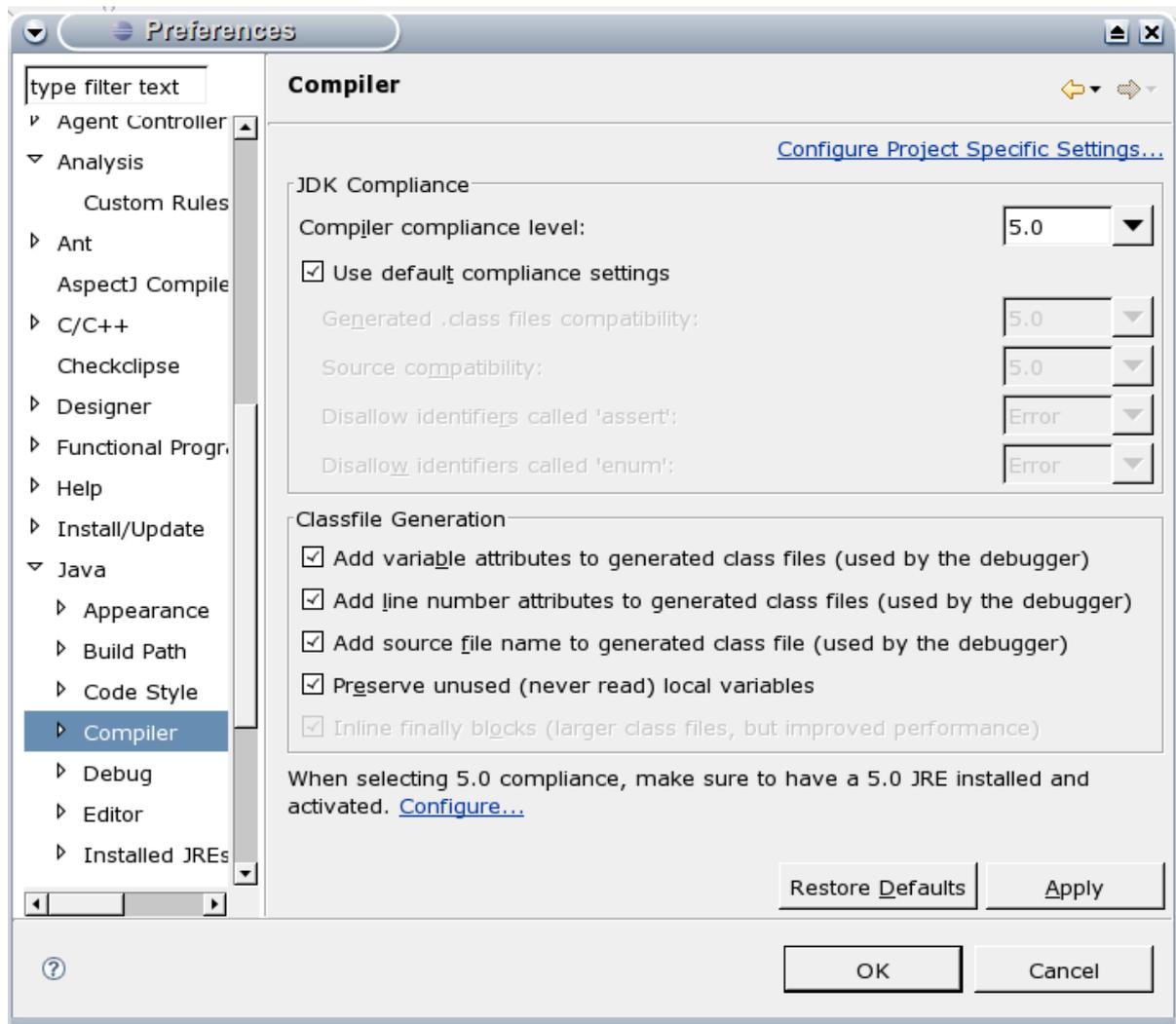


Figure 1: Eclipse's Preferences window, with the Java/Compiler options currently displayed.

Question 4. Visual & Interactive Design

[20 marks]

(a) [6 marks]

Identify two different types of signs in figure 2. For each sign type that you identify, select an example from the figure and justify why that example is of that type.

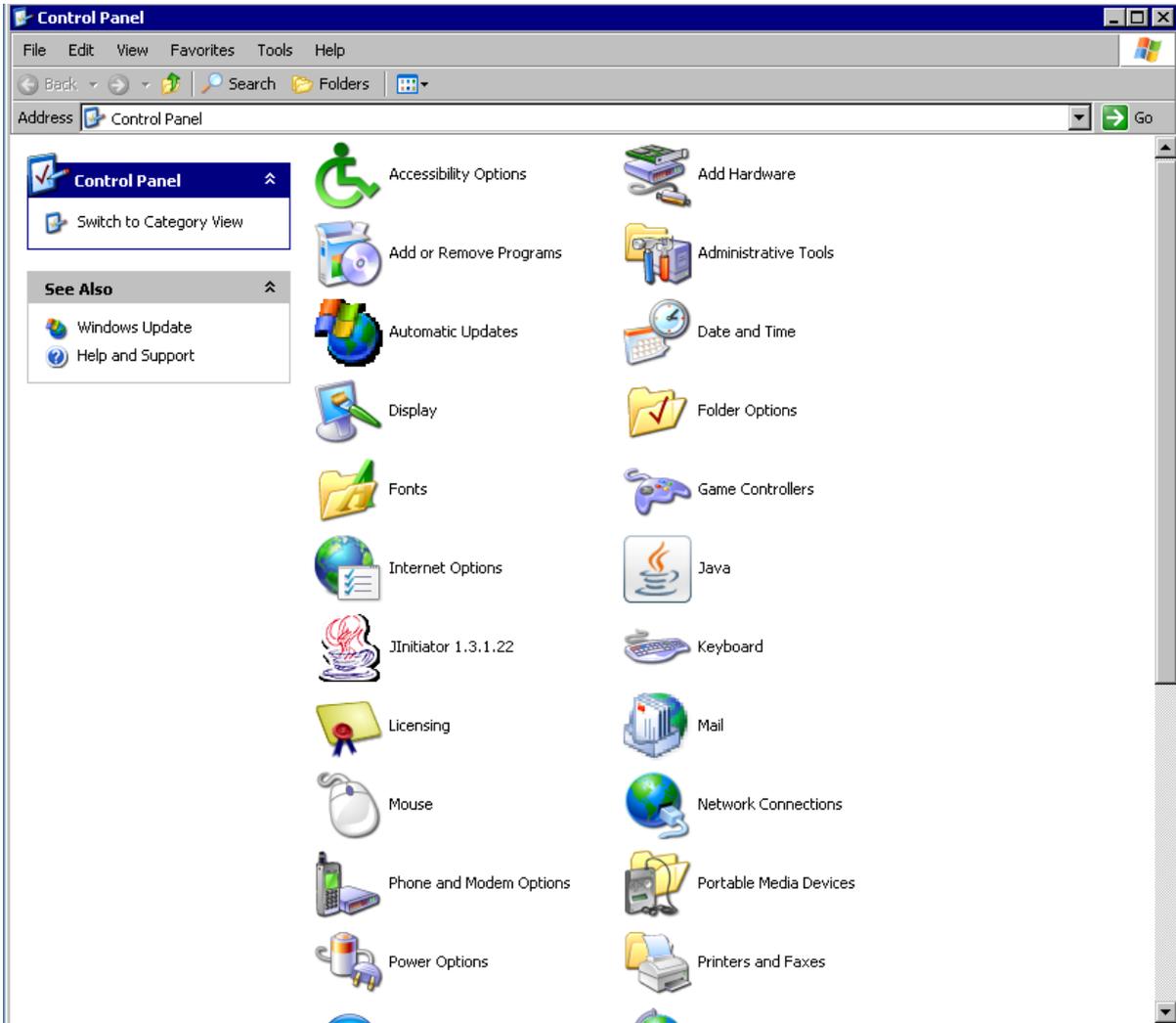


Figure 2: The Microsoft Windows Control Panel in tiled view mode.

(b) [14 marks]

With respect to the four visual design principles discussed in the lectures, draw an improved design for the poorly constructed business card in figure 3. For each of the four visual design principles, write a one-two sentence justification as to why your design is better than the design in the figure.

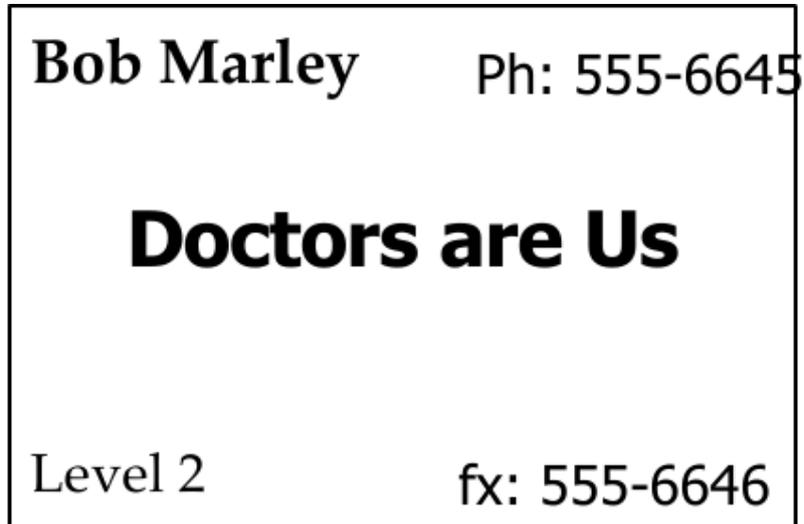


Figure 3: A poor design for Bob Marley's business card. Bob works at "Doctors Are Us" on level 2 of DAU House.

Question 5. World Wide Web

[30 marks]

(a) [5 marks]

Imagine a situation where you are writing a weekly opinion column on the web. The URL <http://www.myopinioncounts.com/column.html> points to the current column for that week, and this is changed every Sunday. The website's homepage includes links to columns from past weeks. Describe one difficulty this can create with respect to how users may navigate back to interesting information they found in your column after they have already read it.

(b) [20 marks]

Discuss six improvements that could be made to Victoria University's new website, based on the two screenshots in figures 4 and 5. The first screenshot is the main homepage reached when using the URL <http://www.victoria.ac.nz>, while the second screenshot is the result of clicking on the *Current Staff* link in the homepage's right-hand side navigation.

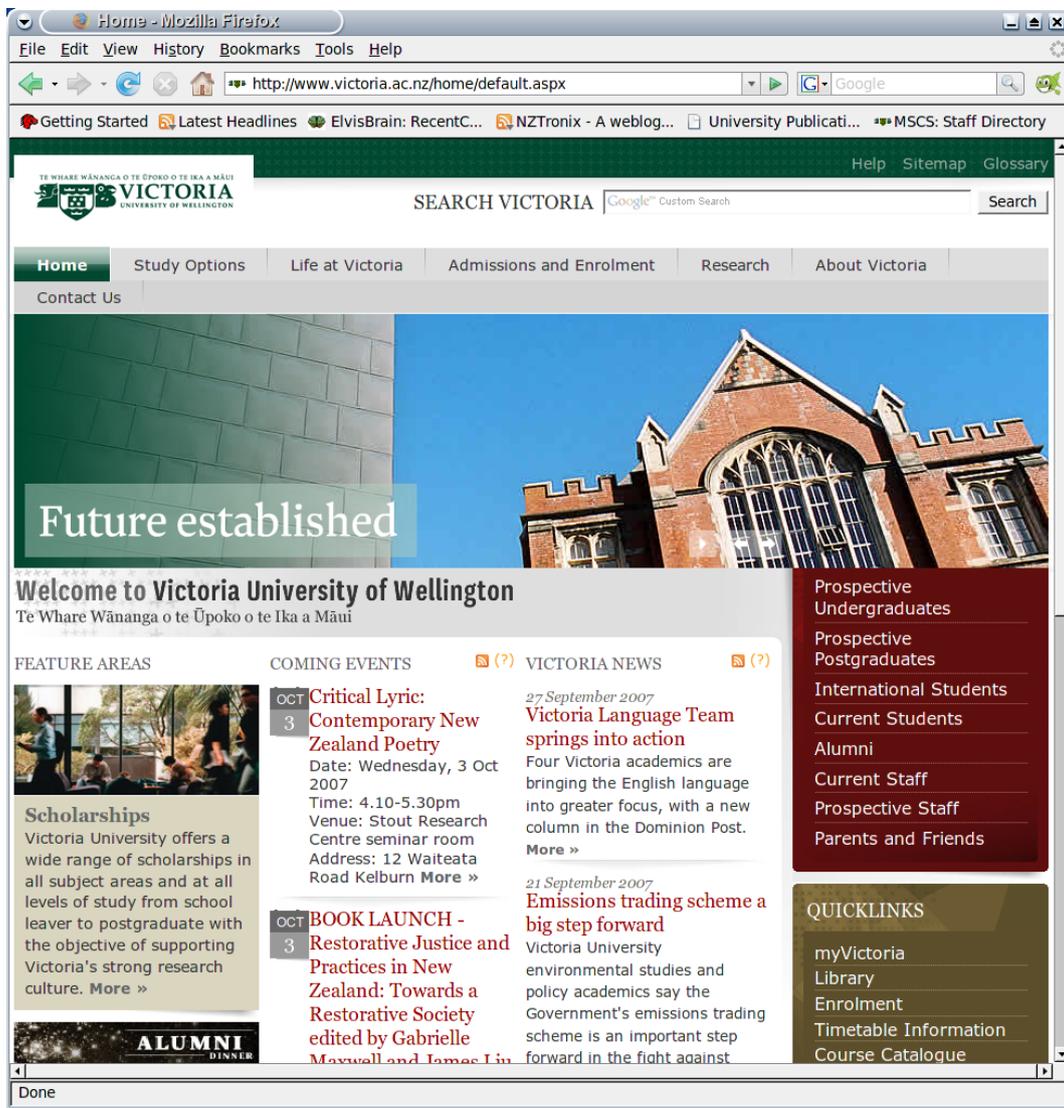


Figure 4: Victoria University of Wellington's new homepage for its redesigned website. The homepage is displayed in Mozilla Firefox.



Figure 5: The login page for the MyVictoria portal, displayed when the user selected “Current Staff” in the University homepage’s right-hand navigation bar.

(c) [5 marks]

Jakob Nielsen stated that *non-scannable text* and *anything that looks like an advertisement* were two of his top ten mistakes in web design for 2006. Discuss what Nielsen meant by these two terms.

Question 6. Advanced Technologies

[25 marks]

(a) [3 marks]

What type of device is a force-feedback joystick an example of?

(b) [6 marks]

Discuss how the absence of the sense of touch can make navigation in a fully immersive virtual world difficult.

(c) [8 marks]

Consider two senses (other than sight) and discuss a key challenge for each sense with respect to creating a fully-immersive virtual reality system.

(d)

Gestural interfaces allow us to use gestures to communicate with computers in the same way that we communicate with other people.

(i) [3 marks]

Contrast gestural interfaces to using a pointer device such as a mouse.

(ii) [5 marks]

Contrast the types of information that are easy to convey in gestural interfaces with the types of information that are easy to convey in voice-controlled interfaces.
