CO328/2021

COMP3280/COMP3281

UNIVERSITY OF KENT

DIVISION OF COMPUTING, ENGINEERING AND MATHEMATICAL SCIENCES

LEVEL 4 EXAMINATION

Human Computer Interaction

Saturday, 15 May 2021

Paper Instructions
The paper contains FOUR questions. Answer THREE questions. This examination is designed to take 2 hours but you can take longer if you wish. Please ensure that you submit your answer booklet within 24 hours of the exam release time.
Notes to Candidates
This is an open book examination to be completed and submitted within 24 hours.
As you will have access to resources to complete your assessment, any content you use from external source materials should be cited. Full academic referencing is not required.
You are reminded of your responsibility to act with honesty, integrity and fairness in completing assessment requirements for your course, and to demonstrate good academic practice when undertaking this assessment.
This is an individual piece of work and collusion with others is strictly prohibited.
Plagiarism detection software will be in use.
Breaches of academic integrity will be considered to be academic misconduct.
Where the University believes that academic misconduct has taken place the University will investigate the case and apply academic penalties as published in Annex 10 of the Credit Framework.

1. Heuristic Evaluation (HE) is a useful method to evaluate a computer interface. It has a standard report format and 10 Heuristics rules. Suppose you want to develop a mobile app for online Burger ordering and delivery as a UI/UX designer.

   (a) For each of the following usability problem, use the HE Report format to list which Heuristic rule it goes against and justify the reason, give a Severity rating within a scale of 0-4 and justify the reason, and suggest a Fix. [10 marks]

      (i) Problem 1: No progress indicator for payment processing page, which takes more than 10 sec to respond.

      (ii) Problem 2: Users are not able to input a delivery address.

   (b) As a software development team manager, you need to fix the above 2 usability problems. Which problem(s) do you have to fix before releasing the app? Justify your answer using one sentence. [4 marks]

   (c) There are a wide range of controls and widgets to choose for the user interface design. For each of the following page design, list which type of digital controls and widgets should be used. [6 marks]

      (i) Page 1: Users can choose one type of burger from Hamburger, Chicken burger, Veggie burger.

      (ii) Page 2: Users can choose one or multiple toppings from Tomato, Lettuce, Pickles, Cheese.

      (iii) Page 3: Users can select one type of cheese from Mozzarella, Gouda, Cheddar, Swiss cheese, Blue cheese, Brie, Monterey jack, Goat cheese.

2. KLM-GOMS stands for Keystroke-level model for Goals, Operators, Methods, and Selection rules. It is composed of *methods* that are used to achieve specific goals. In KLM-GOMS, *methods* are composed of operators at the lowest level. Operators might include K(key/button) =0.2 sec, P(point) = 1.1 sec, H(home) = 0.4 sec, M(mentally prepare) = 1.35 sec, R(response)

(a) For the currency converter listed in Figure 1 below, estimate the time to for Hal to use the interface for converting 3 pounds into Euros by showing the workout apply the following steps where necessary. Assume Hal's typing is perfect; error detection and notification are not needed. The default currency is pounds to Euro. After a number is input in the text box corresponding to pounds, the conversation is immediately displayed in the text box next to the Euro. No enter key is required to fulfill the conversation.

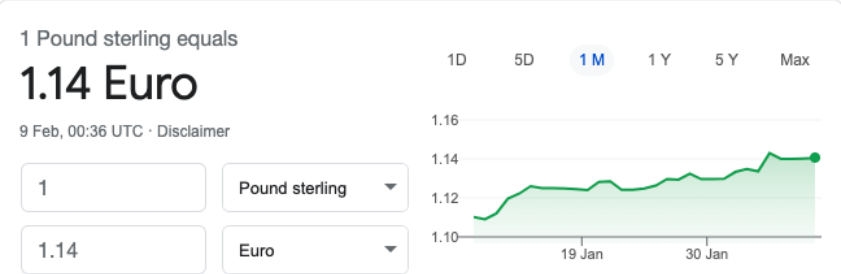

Figure 1: Online currency converter interface.

(i) Step 1: Operators (HPKHK) are involved to achieve the task. Justify the choice of each operator using one sentence.

(ii) Step 2: Apply Rule 0, add Ms in front of all Ks and Ps that point to commands.

(iii) Step 3: Apply Rule 1, change PMK to PK to remove fully anticipated Ms.

(iv) Step 4: Apply Rule 2, to eliminate Ms in the middle of strings that are cognitive units.

(v) Step 5: Apply Rule 3, deletion of Ms before consecutive terminators.

(vi) Step 6: Apply Rule 4, deletion of Ms that are terminators of commands.

(vii) Step 7: Apply Rule 5, deletion of overlapped Ms.

(viii) Step 8: Calculate the time.

[12 marks]

(b) Colour vision and perception play an important role in user interface design. Answer the following questions with one sentence.

(i) Choice of colour combination in interface design: different wavelengths of light focused on different distances behind eye's lens, therefore colour combinations need extra care in user interface design. Which two colour's combination would cause eye to fatigue the most; justify your answer (red and yellow, green and red, green and orange, red and blue)?

(ii) State the consequence of an interface design with only two colours (red and green) to indicate its states.

(iii) You want to create a web interface for an organic food company for online order. In order to represent the company's ethos of linked to nature, peace, well-being, environment-friendly and freshness, which of the three colour scheme (red, blue, white, green) you should choose for the theme of the web design.

(iv) In order to design a lo-fi interface, what is the best choice of colour for the interface.

[8 marks]

3. Human Centred Design (HCD) Process consists of five stages: Empathise, Define, Ideate, Prototype, and Test.

(a) For each of the following activity, match the activity to the most appropriate HCD stage as above.

(i) Activity 1: A paper model of the actual design is developed.

(ii) Activity 2: Users are asked to evaluate the design and give comments.

(iii) Activity 3: Several designs approaches are discussed by development team.

(iv) Activity 4: Information collected from users is tabled in a structured form.

(v) Activity 5: Users are interviewed to obtain their requirements.

[5 marks]

(b) HCD utilises many heuristics and design approaches. For each of the following scenario, give the appropriate name of the heuristic or activity. Briefly (**in no more than one sentence each**), explain your reasoning for giving the heuristic/activity names.

(i) Scenario 1: In a shop, there are two entry doors; one big and another small.

(ii) Scenario 2: A company manager wants good quality software. The manager is willing to spend a lot of money but wants fast delivery of the completed software.

(iii) Scenario 3: In a web interface, a software developer has designed very large buttons to help the elderly click the buttons easily.

(iv) Scenario 4: A person tries to remember a telephone number (01634888867) by partitioning it into three parts: 01634 888 867.

(v) Scenario 5: Mother’s maiden name is used to retrieve passwords.

[15 marks]

4. For this question, you will need to design a simple interface for a condenser tumble dryer. The condenser tumble dryer has only FIVE functions and there is no digital display of any sort:

    - START/STOP
    - HIGH/MED/LOW temperature setting
    - Timer
    - Water tank full warning
    - Special cycle for delicate clothes

    (a) Sketch an interface design (with appropriate annotations on its usage) that includes approximately designed menu interface for the five functions above.

    [10 marks]

    (b) For each feature that you have designed, list a design principle and explain (**in no more than one sentence each**) how the feature implements the principle.

    [10 marks]