# THE UNIVERSITY OF AUCKLAND

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**FIRST SEMESTER, 2015**

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**COMPUTER SCIENCE
&
SOFTWARE ENGINEERING**

**Human Computer Interaction**

**(Time allowed: 50 minutes)**

**NOTE:**     Answer ALL questions.

This test contributes 15% to your final grade.

Write your answers **legibly** on this paper.

Overflow space is available at the end of the test paper, indicate at the end of the original question if you are using overflow space.

| Question | Topic | Out of | Marks |
|---|---|---|---|
| 1 | Short answer | 10 | |
| 2 | Interaction Modelling | 6 | |
| 3 | User Modelling | 7 | |
| 4 | Vision and Reading | 7 | |
| **TOTAL** | | **30** | |

| Name: | UPI: | ID: |
|---|---|---|
| | | |

**1.      Short Answers**

[10 marks]

Fill in the blanks with one or two words each.

a) HCI stands for Human, Computer Interaction.

b) A person who either supplies input or receives output from a system but does not interact with it directly is known as a secondary stakeholder.

c) Fitts' law states that the time taken to hit a target depends on its distance from the current location and the size or width of the target.

d) How fast can a user who has never seen the user interface before learn it sufficiently well to accomplish basic tasks is the usability factor Ease of learning.

e) The essential difference between the results of a heuristic evaluation and a usability test is that the heuristic results are opinion (subjective or assumption .5) while the usability test results are fact.

f) Usability tests usually report quantitative data of task time and errors (success rate .5)

g) The overriding principle of ethics when conducting human studies is that participants must give informed consent. (xxx consent or just consent .5)

h) Nielsen's heuristic recognition rather than recall is to minimizes users memory/cognitive load.

i) Implementing undo functionality as an effectiveness goal is an example of the safety design principal.

j) A site that is aesthetically pleasing is perceived as more usable, error tolerant and trustworthy. [½ mark for safe]

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## 2.  Interaction Modelling (6 Marks)

Model the following as a state transition network.
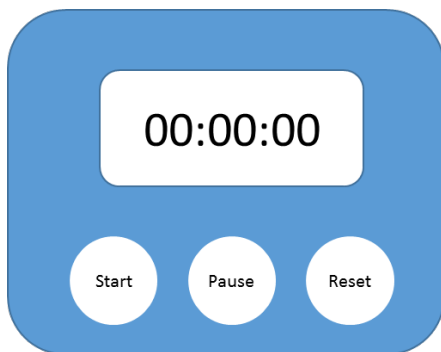


The device shown above is a stopwatch. The functionality is as follows.

When the Start button is pushed: if the timer is not running the timer is started and the display increments every second; if the timer is running no action is taken.
When the Pause button is pushed: if the timer is running it stops and the display remains with the current time on it. If the timer is not running the timer is started and the display increments every second.
If the reset button is pushed: the timer is stopped and the display set to zero.
Any multiple synchronous button presses have no effect.
Assume that at the STN Start the timer is zero and the STN finish is when the reset is pushed.
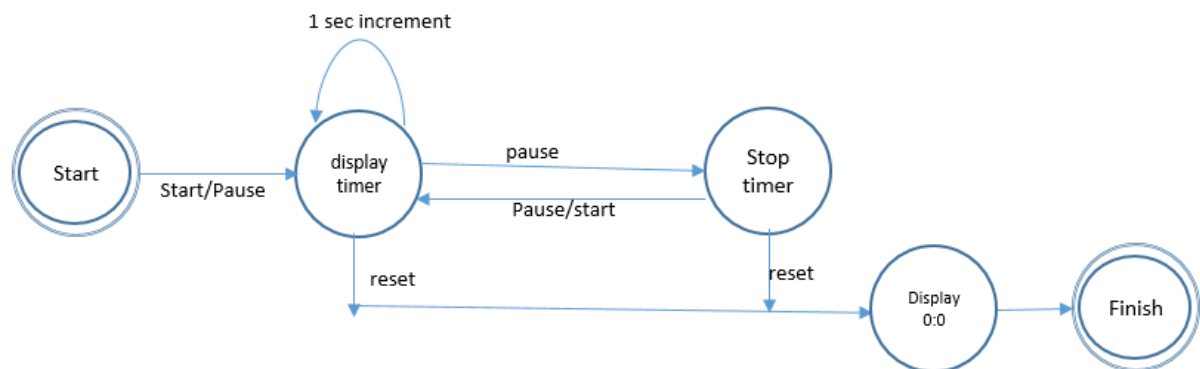


Generally well done with most people getting >4 and quite a few 6's – you should have recognized it as a simplified version of the timer/stopwatch done in the lecture and tutorial.

Most common errors: missing set to 00:00 at reset (-1); adding start loop on display timer (this was a red herring) (-.5); missing Start/Pause combinations (-.5). There are at least 350 different ways to do this diagram – you proved it! Apart from correctness syntax and layout were given minor consideration  -e.g.  if the mark was between 4-4.5 for correctness and it was syntactically correct you would get 4.5, if there were glaring syntax errors you would get 4.

**Assumptions**: list here any assumptions you want to convey to the marker. You can get full marks leaving this section blank!

**2.      User Modelling    (7 Marks)**

Understanding and designing for the characteristics of typical users is paramount to successful UI design. There are different methods for doing this at different stages of the design process.

a)  Name and describe the technique for capturing user capabilities during the requirements gathering process.                                    [2 Marks]

(1)Primary stakeholder   profiles – describes via a tick box form the attributes of a user (lecture 2 slide 41)  and or
Interviews, observation, elicitation (L2)

(1)  Sensible description of above

b)  Name and describe attributes of the archetypical user descriptions created in the early design phase.                                    [2 Marks]

(.5) Personas ……
(1.5)    name, goals, Behaviours and a personality, relevant background

c)  User tasks can be modelled using a variety of techniques. Describe the user centred method for describing tasks.                                    [3 Marks]

(1)Scenario – A description in 'plain English' of a typical task
(1) PACT
(1) It describes:  basic goal, conditions that exist at the beginning of the task; activities in which the persona will engage,  outcomes of those activities

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### 3. Vision and Reading (7 Marks)

Vision is a very complex process where we convert visible light into a format that we can understand.

a) What are the two stages of vision?

[2 marks]

i) <u>Physical reception of stimulus</u>

ii) <u>Processing and interpretation of stimulus</u>

b) What are the two components in the retina that detect light? State the name of each component and the type of light that it detects.

[3 marks]

i) <u>Rods [½ mark] – detect low levels of light or movement [1 mark]</u>

ii) <u>Cones [½ mark] – detect colour [1 mark]</u>

c) What is one type of information we need to interpret what we read?

[1 mark]

i) <u>Any of: context, syntax, semantics, or pragmatics</u>

d) What is one of the first things we detect when looking at text?

[1 mark]

ii) <u>Word shape [allowed pattern for ½ mark]</u>

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**END OF TEST QUESTIONS – OVERFLOW PAGE FOLLOWS**

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OVERFLOW PAGE