Making assessment and feedback fun: feedback before and after assessments

Motivation: To create a scientific approach to testing, that is designed with feedback in mind at every stage.

- Requirement for Feedback.
- Test Design and Creation
- Test Preparation and Analysis
- Feedback System
- Some Results
- Conclusions

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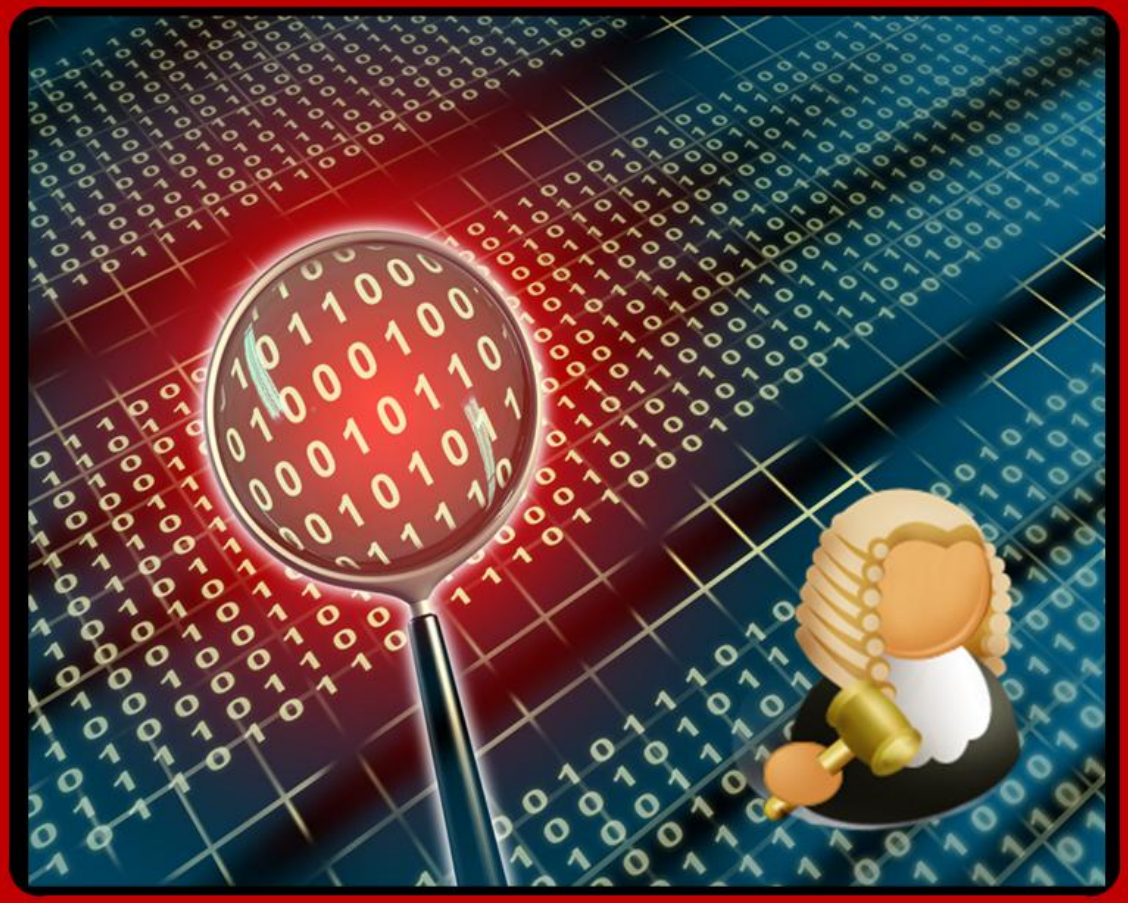
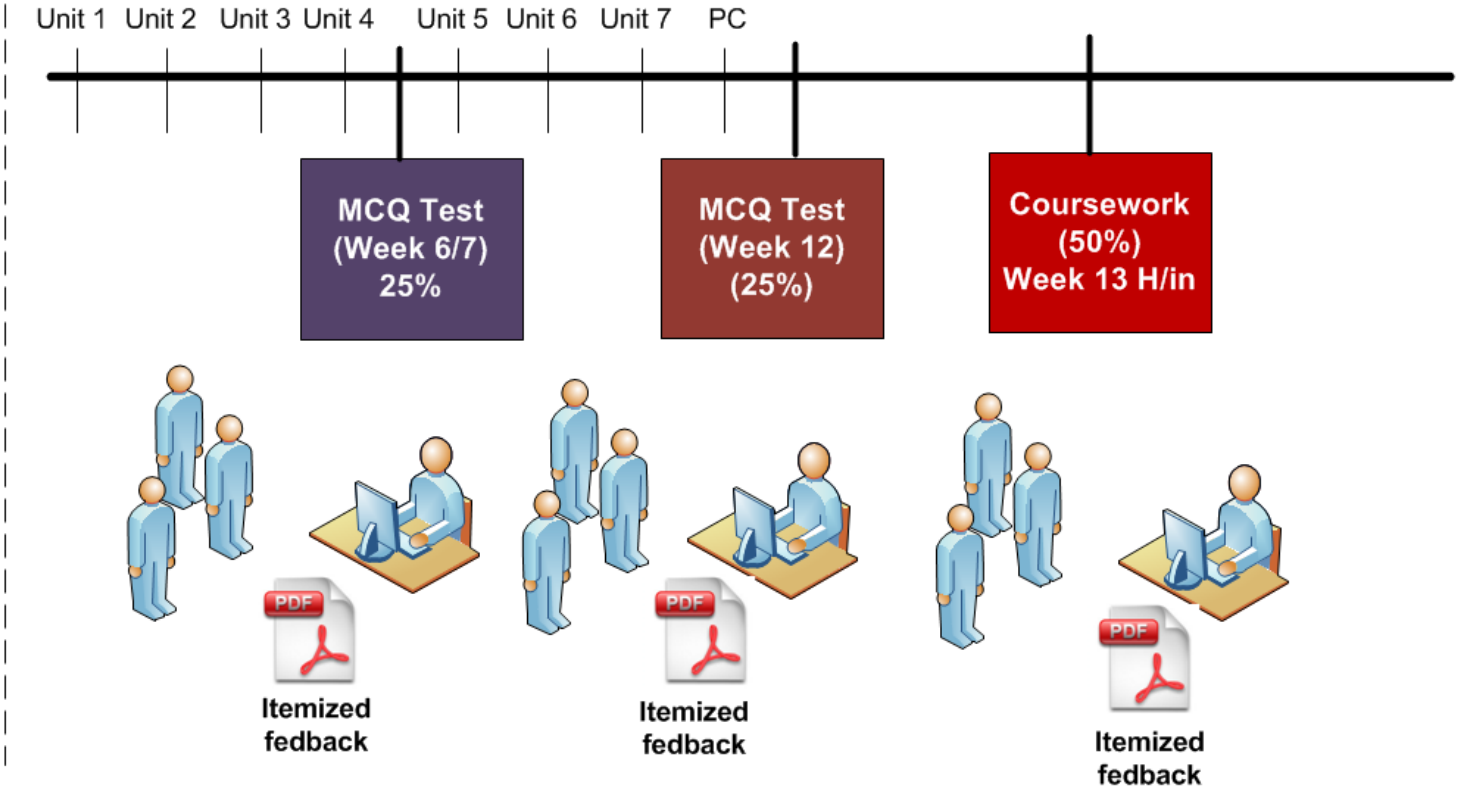
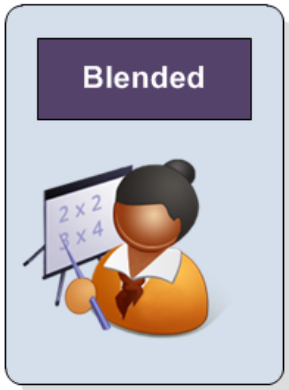
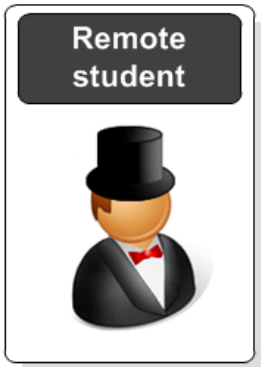
Feedback...



The Requirement for F/B







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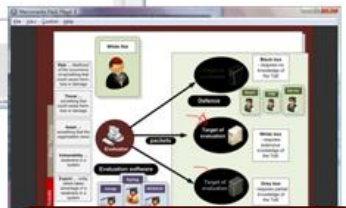
Feedback...

Time line requirments

Increasing requirement for feedback

Re-enforce Units → Pre-test → Test/ Assessment → Wind-down And Formal Feedback

Tests



On-line lectures

iPhone/iPad

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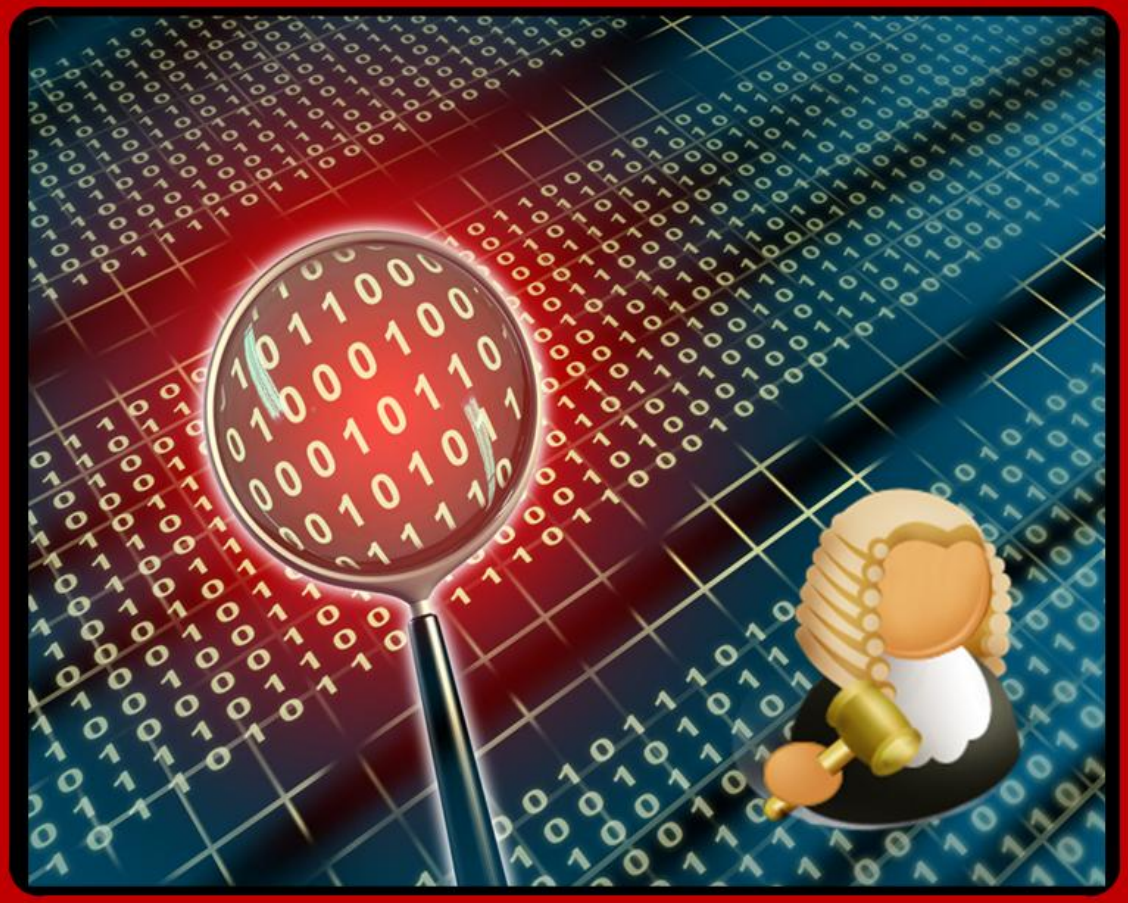
The challenge ...

Feedback...

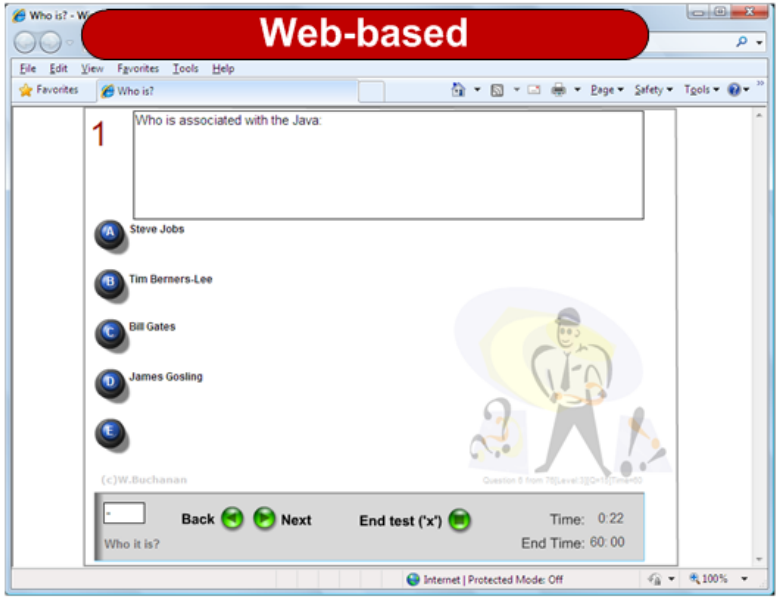


Preparing for the test

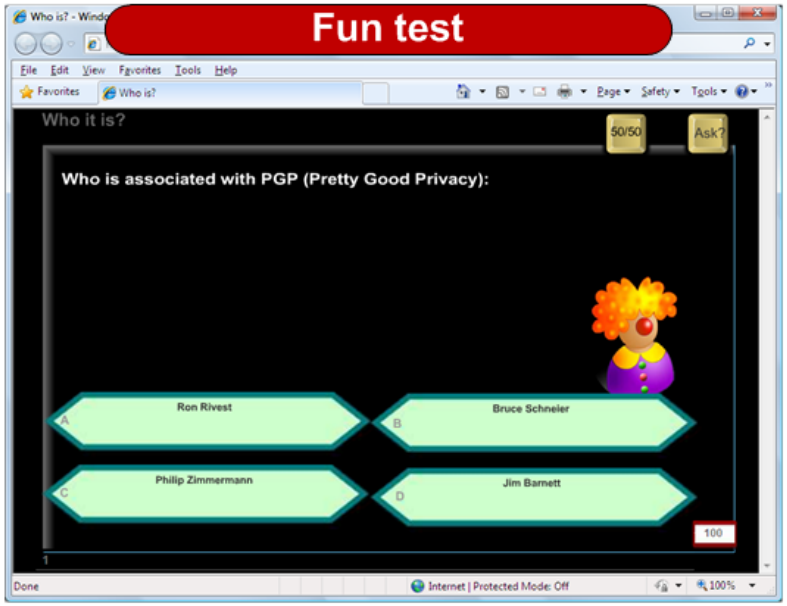
Different interfaces

Feedback...

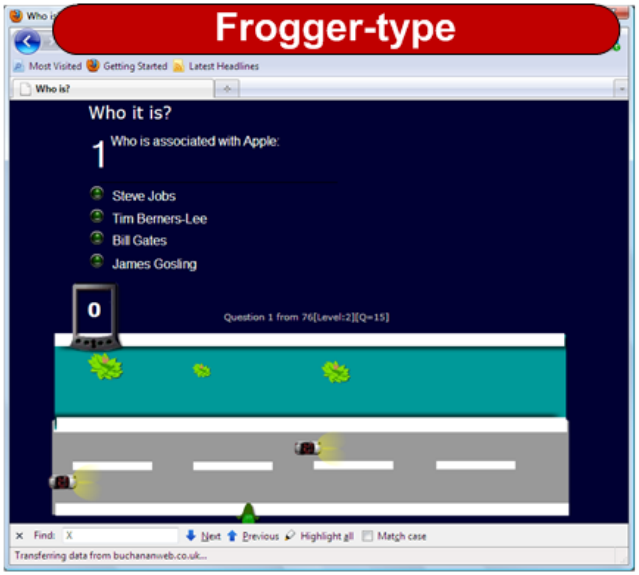
Web-based



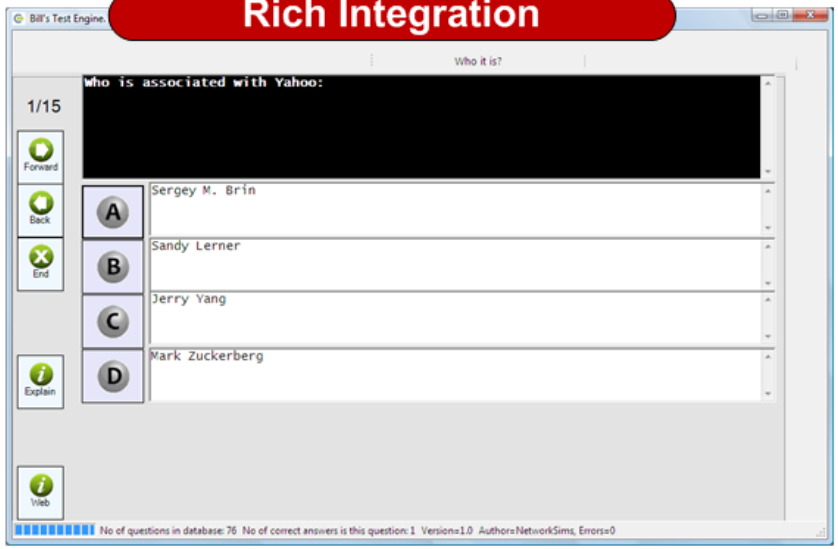
Fun test



Frogger-type



Rich Integration



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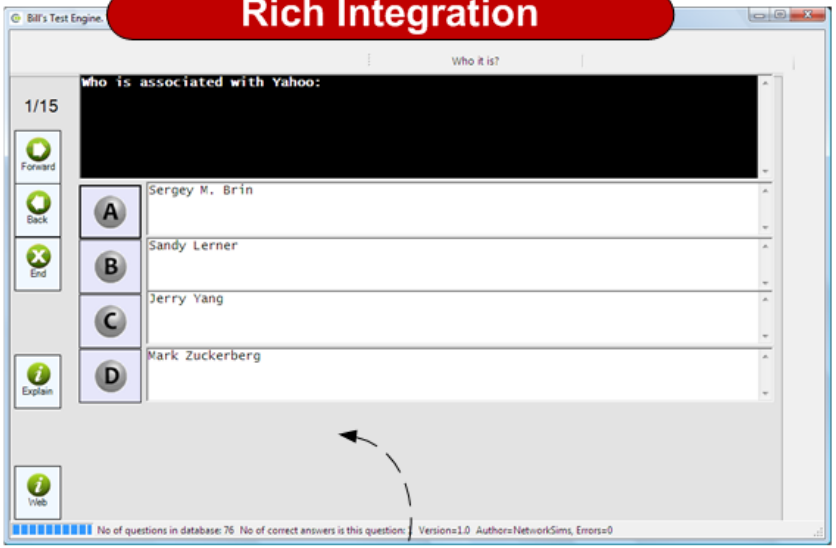
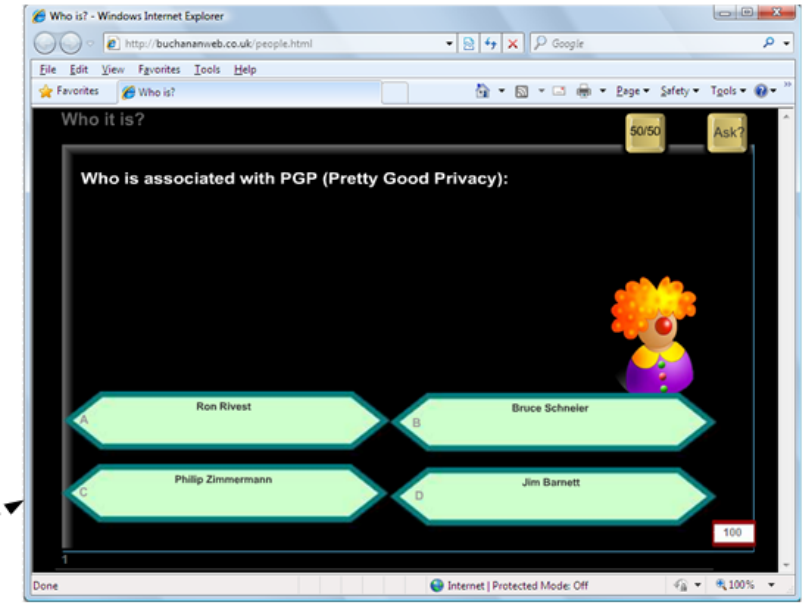
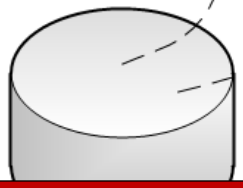
Rich Integration







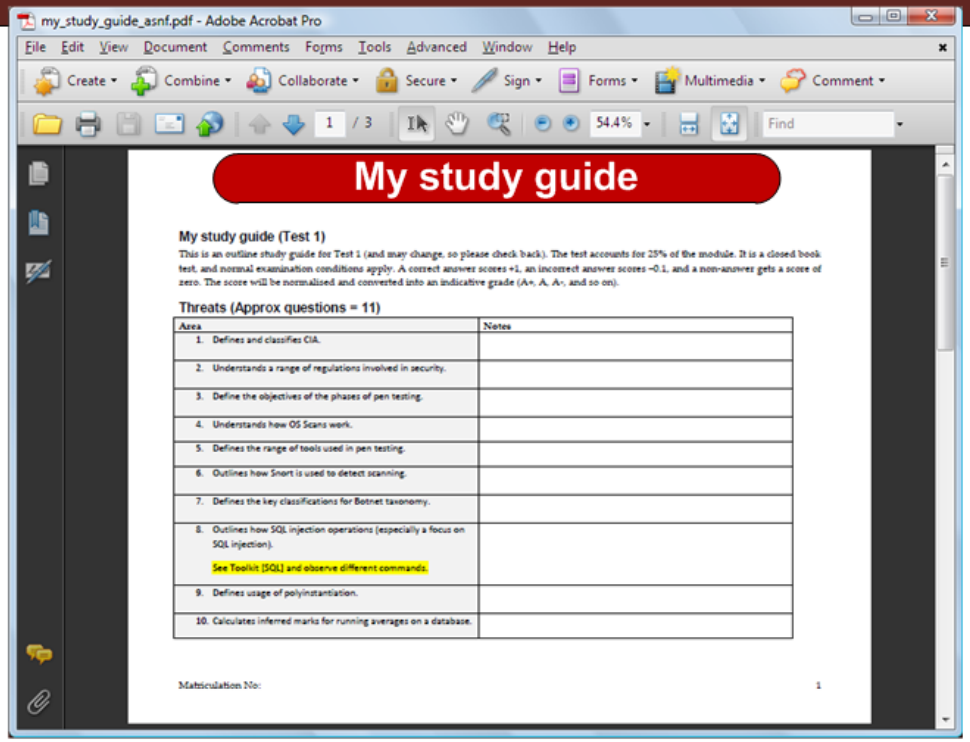
Common data storage

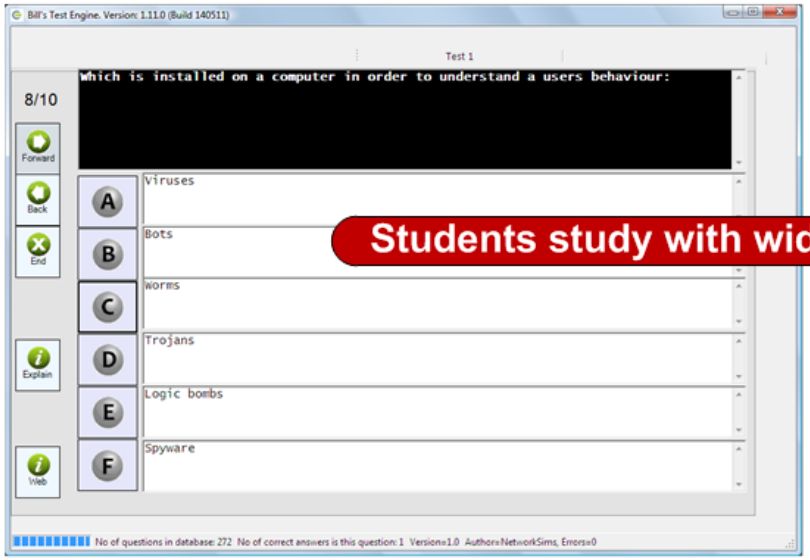
```
<quest id="000001">
  <title>Who is associated with Apple:</title>
  <q1>Steve Wozniak</q1>
  <q2>Tim Berners-Lee</q2>
  <q3>Bill Gates</q3>
  <q4>James Gosling</q4>
  <correct>q1</correct>
  <level>1</level>
  <explain>http://en.wikipedia.org/wiki/Steve_Wozniak</explain>
</quest>
```

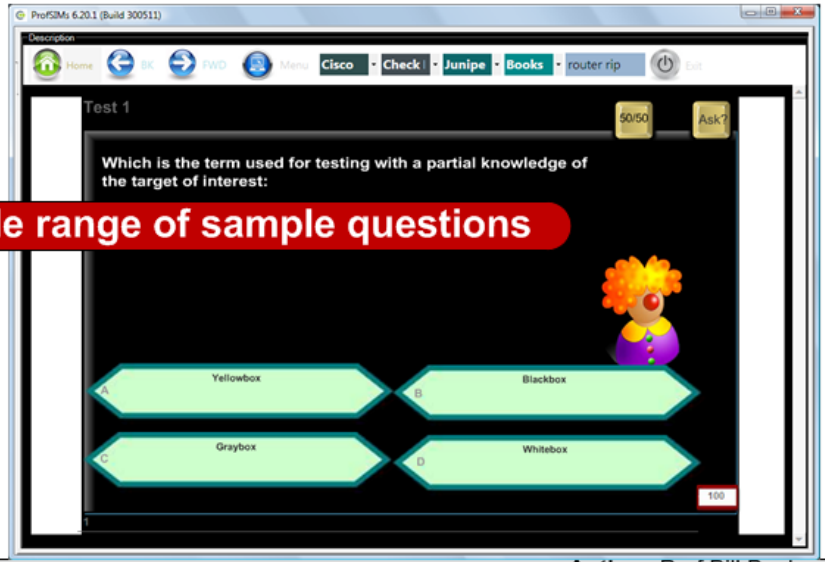
Different interfaces

Feedback...

Author: Prof Bill Buchanan







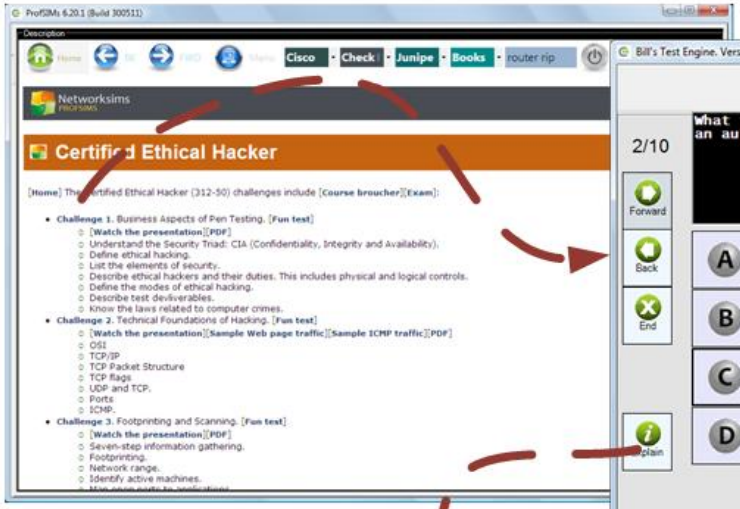
Students study with wide range of sample questions

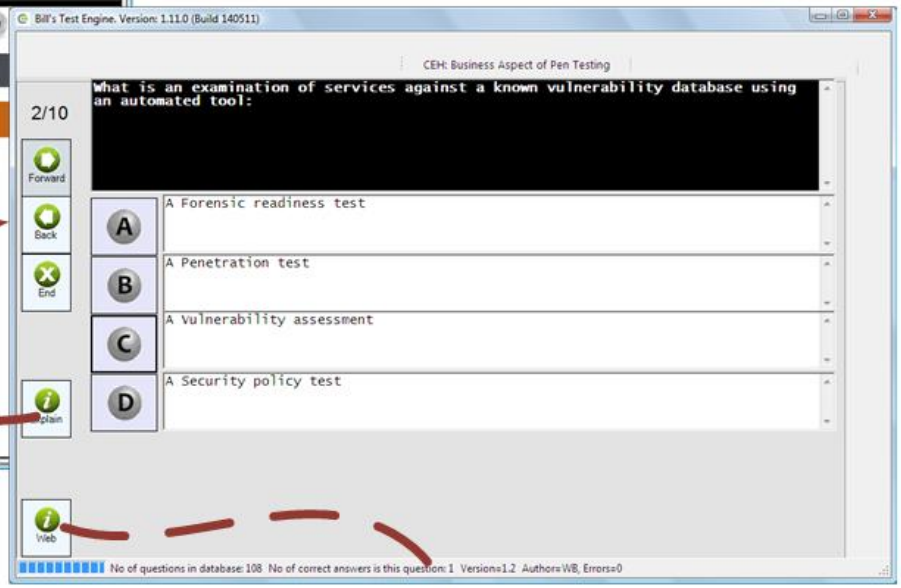
MCQ Ratings

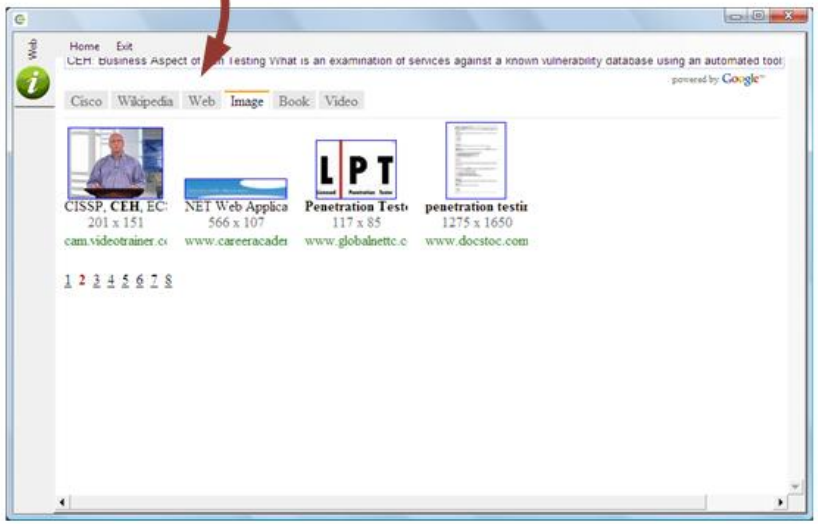
Feedback...

Author: Prof Bill Buchanan

Student study







Providing Feedback

Feedback...

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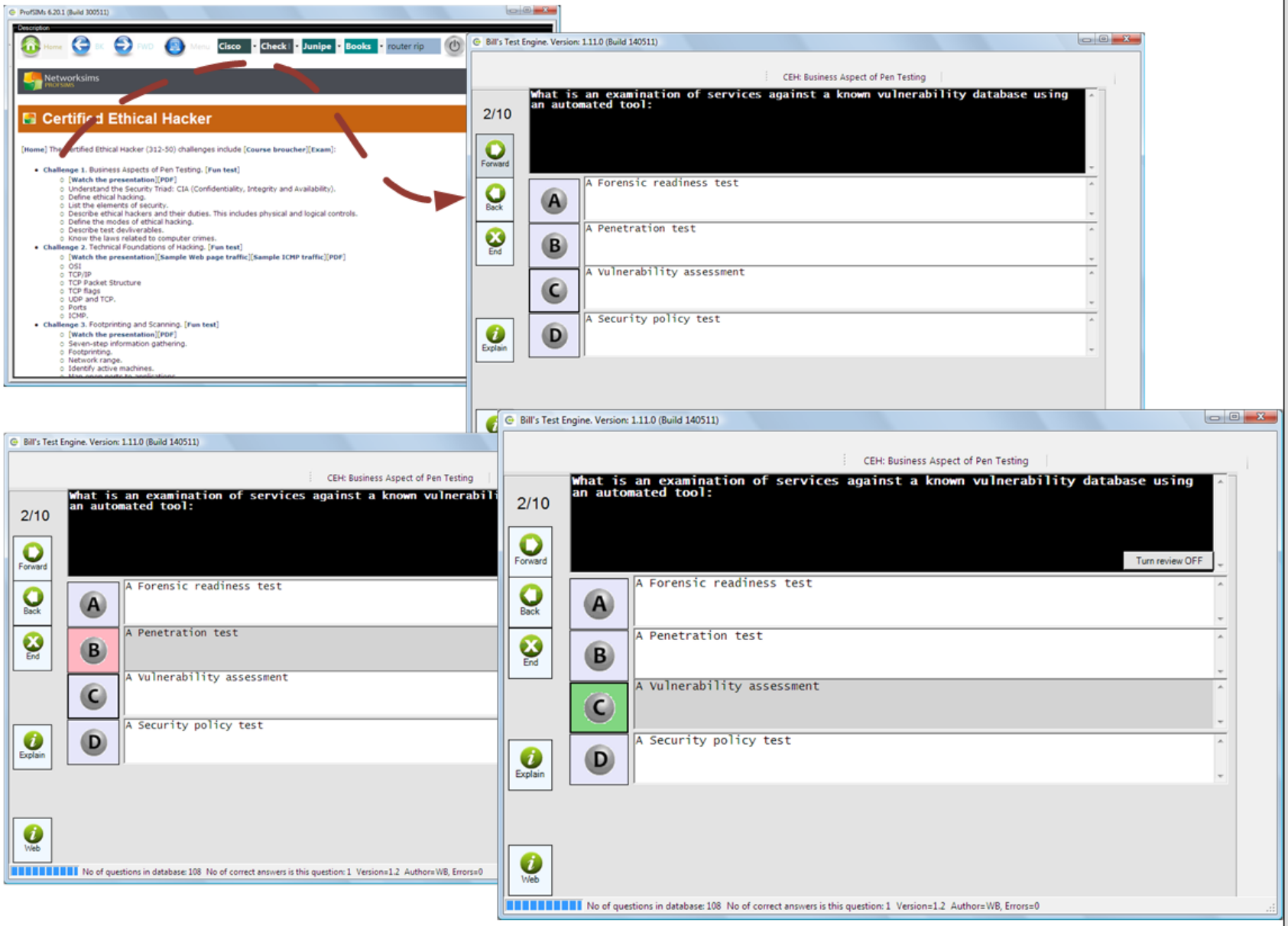
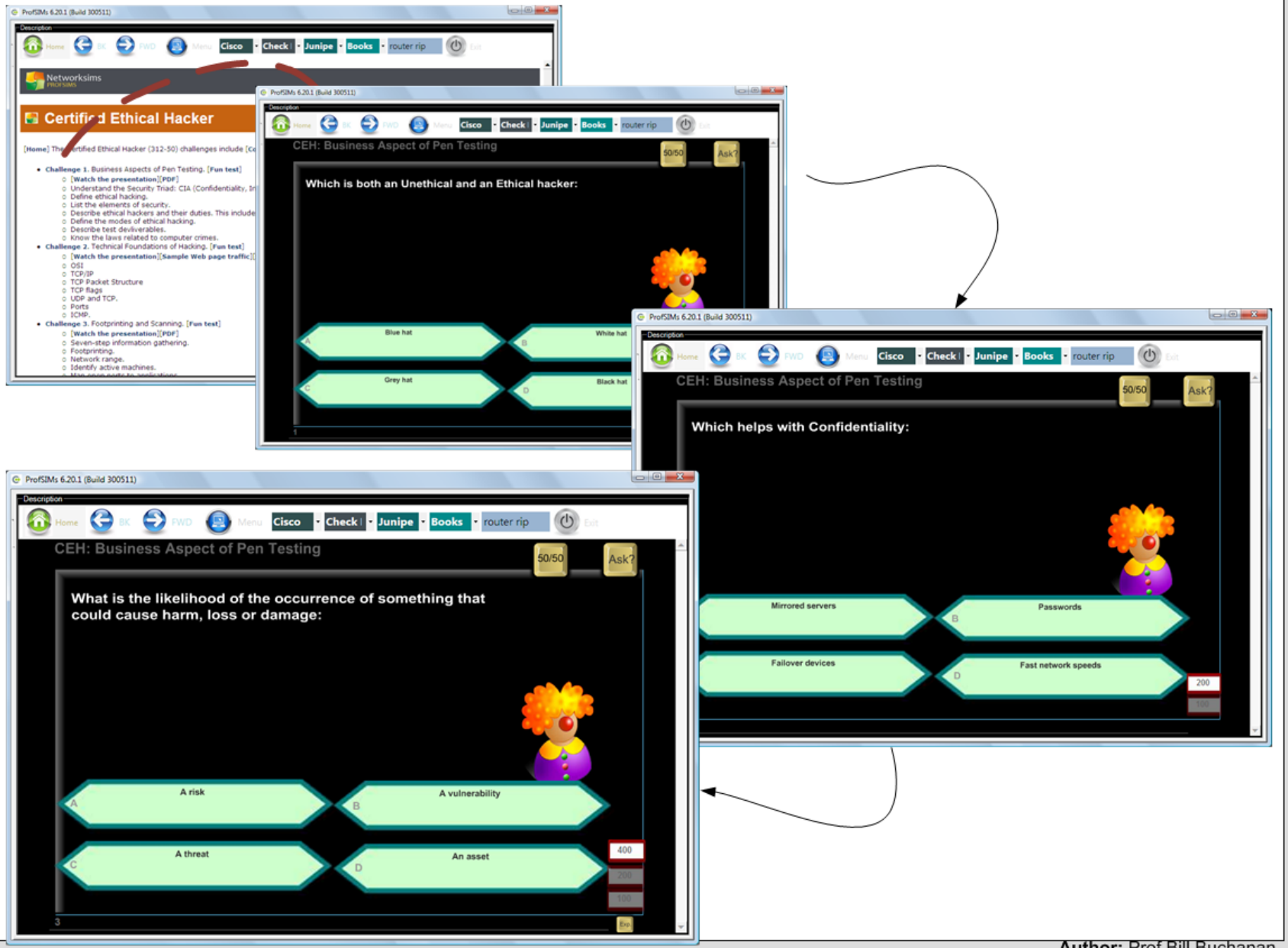
Feedback on correct ans.



Author: Prof Bill Buchanan

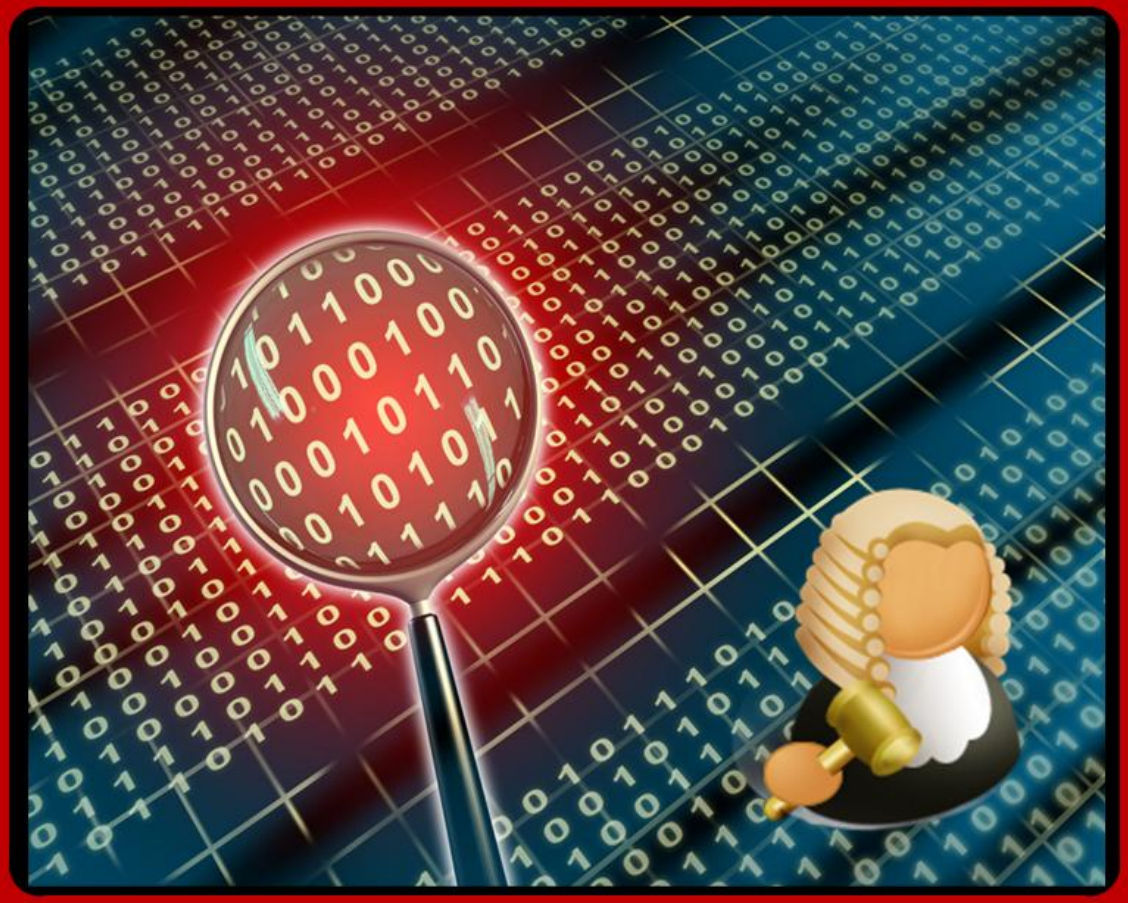


Providing Feedback

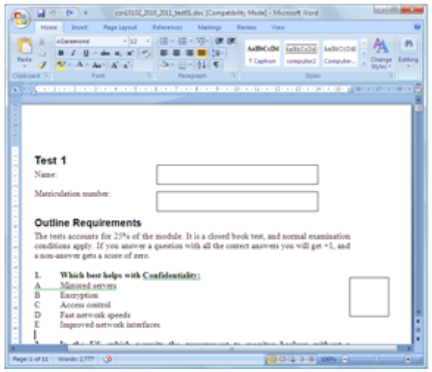
Feedback...

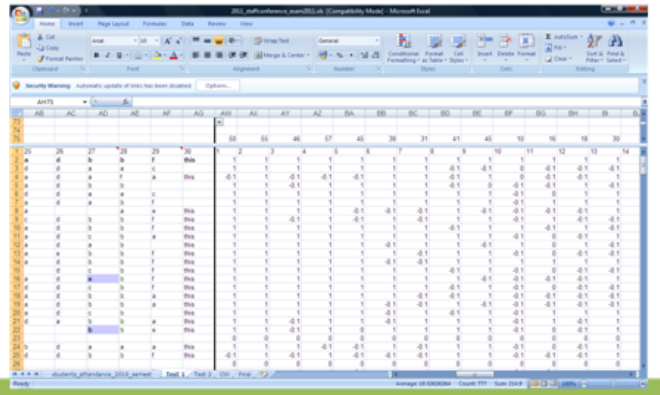
Author: Prof Bill Buchanan

Feedback...



Test Preparation and Analysis





MCQ Ratings

Feedback...

	2011																	
Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Correct	50	55	46	57	45	38	31	41	45	10	16	18	30	56	14	26	23	55
Not ans	8	9	8	8	10	8	10	12	11	13	25	12	8	9	9	8	10	8
Incorrect	9	3	13	2	12	21	26	14	11	44	26	37	29	2	44	33	34	4
Score	49.1	54.7	44.7	56.8	43.8	35.9	28.4	39.6	43.9	5.6	13.4	14.3	27.1	55.8	9.6	22.7	19.6	54.6
Rating	2	1	2	1	3	3	4	3	3	5	5	5	4	2	5	4	5	1

	2010																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Correct	39	44	36	48	42	22	22	38	34	6	10	16	37	44	19	32	10	48
Not ans	13	15	14	14	13	17	16	19	27	24	38	24	13	16	15	14	17	16
Incorrect	17	10	19	7	14	30	31	12	8	39	21	29	19	9	35	23	42	5
Score	44.8	51.6	40.9	56.8	48.7	22.8	22.7	44.2	39.8	2.5	9.5	15.7	42.1	51.7	18.6	35.6	7	57
Rating	2	1	2	1	2	4	4	3	3	5	5	5	2	2	5	3	5	1

Score	Rating		Match	%			
<20	5	Same rating	15	79			
<30	4	One level difference	3	16			
<40	3	Two level difference	1	5	Penalty	-0.1	
<50	2						
<60	1						

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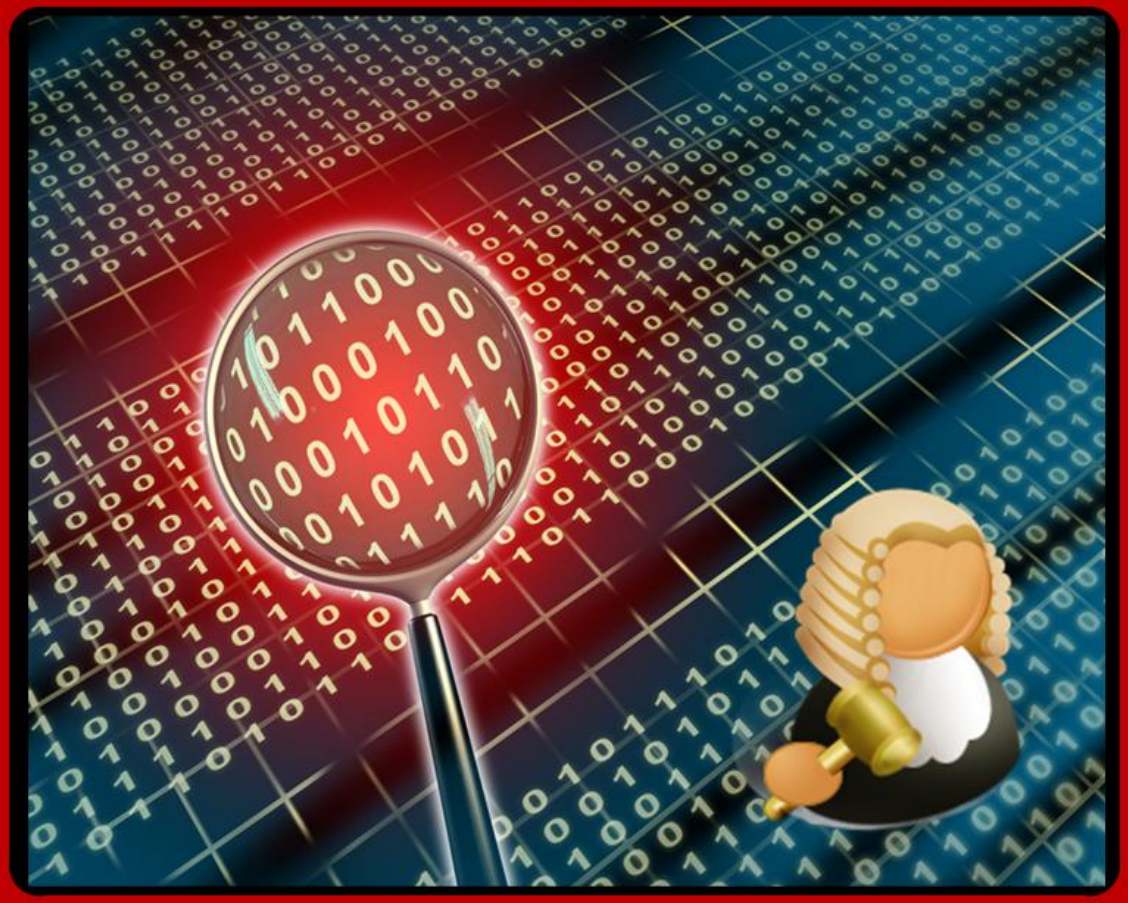
Feedback...



Feedback System

Module Descriptor (with definition of learning outcomes)

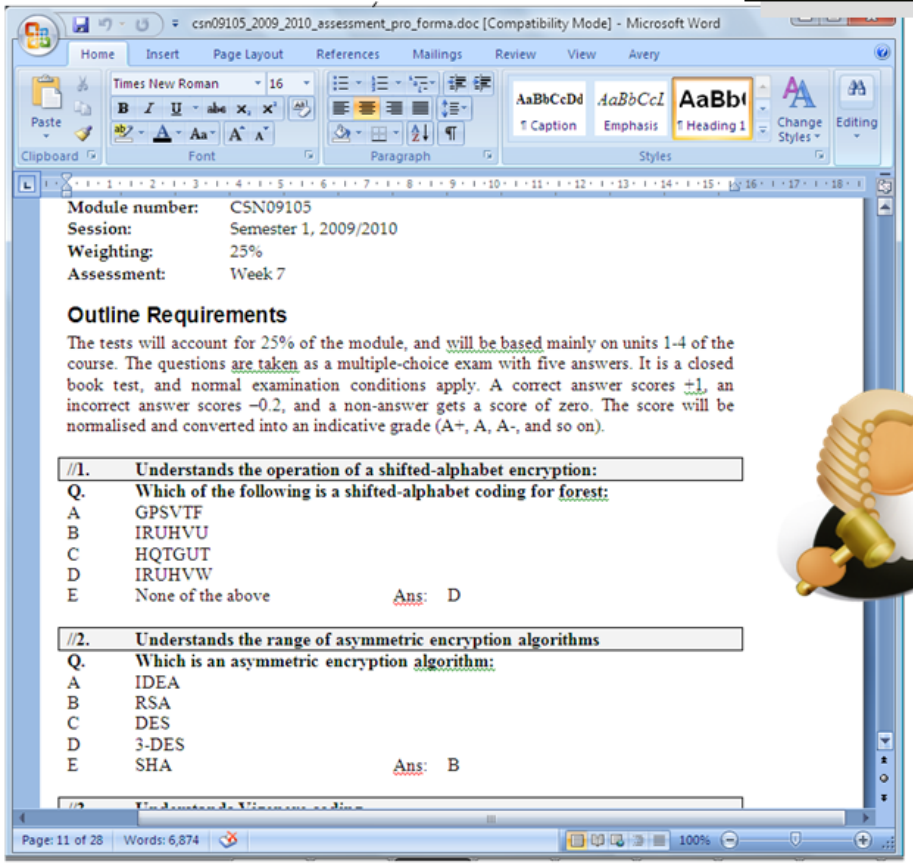
Itemized definition of learning elements

Test created which matches the learning elements

Study guide given to students with definition of learning elements

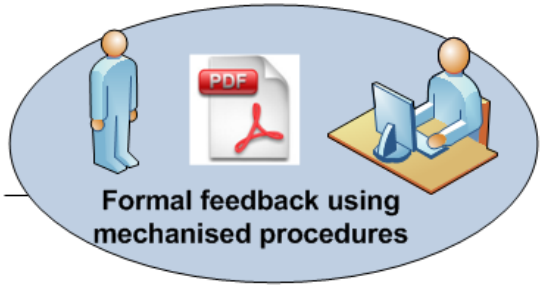
Student practices on-line with a wide range of sample questions

Test analysed for correct and incorrect



Itemized definition of learning items

External Examiner



Formal feedback using mechanised procedures

Good things:

- No students can have any grumbles on the test.
- Students get a quick wind-down.
- Builds up bond with the academic team.
- Little change of errors the evaluation of performance.
- External examiner see an integrated approach.

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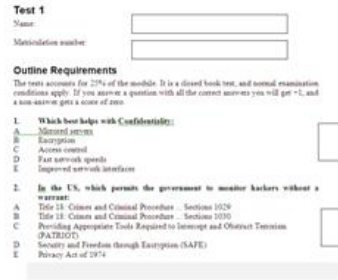
Testing infrastructure

Feedback...

Overall system

Student takes test



Excel Analysis

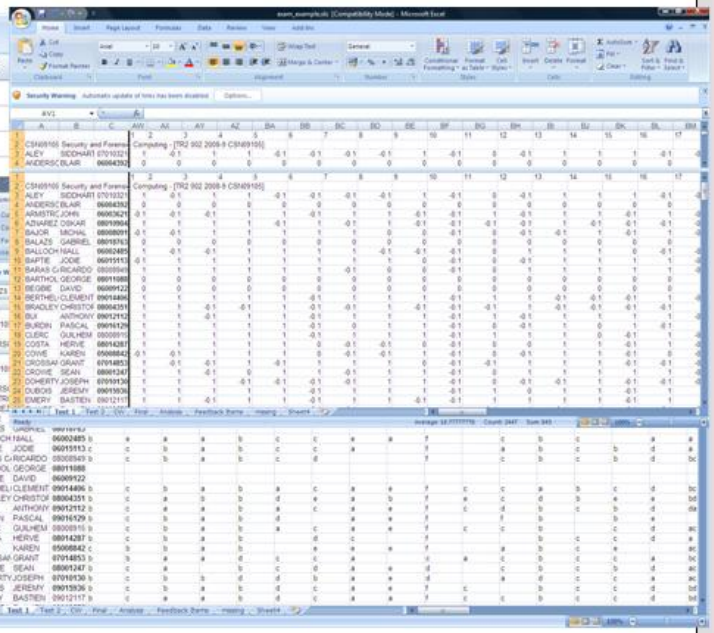
One-to-one Feedback session

Feedback elements

exam_example.xls [Compatibility Mode]

	Question	Rating	Learning Outcome
1	1	2	Classifiies a method of confidentality, such as that passwords keep a secret
2	2	1	Defines the key US laws related to computer security
3	3	2	Defines the key stages of a pen test
4	4	1	Understands the format of NMAP, especially around the main scans
5	5	3	Defines the key stages of a pen test within black box testing
6	6	3	Able to analyse a port scan and how it is used
7	7	4	Defines the characteristics of Botnet taxonomy, and classifies different methods
8	8	3	Understands a sample SQL injection attack using a SQL request to read from a database
9	9	3	Understands a sample SQL injection attack using a SQL request to update data on a data
10	10	5	Does a calculation on average marks and is able to infer the gradings for individual marks
11	11	5	Calculates the number of bits used for a certain enthropy value
12	12	5	Analyses the ARP request and response, for data that has been modified
13	13	4	Analyses a network trace for the key parameters for Ethernet, IP and TCP
14	14	2	Understands how TCP is identified in an IP packet
15	15	5	Analyses a network trace for the TCP segment flow, and the key parameters
16	16	4	Understands the format of UDP parameters, and can determine changes in them
17	17	5	Analyses a network capture from a port scan from an intruder, and shows the packet sent

Test 1 | Test 2 | CW | Final | Analysis | Feedback Items | missing



Feedback...

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Incorrect	9	3	13	2	12	21	26	14	11	44	26	37	29	2	44	33	34	4
Score	49.1	54.7	44.7	56.8	43.8	35.9	28.4	39.6	43.9	5.6	13.4	14.3	27.1	55.8	9.6	22.7	19.6	54.6
Rating	2	1	2	1	3	3	4	3	3	5	5	5	4	2	5	4	5	1

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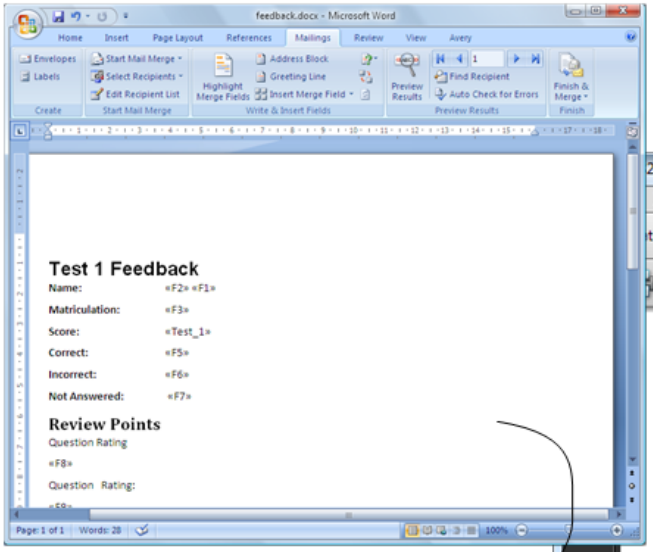
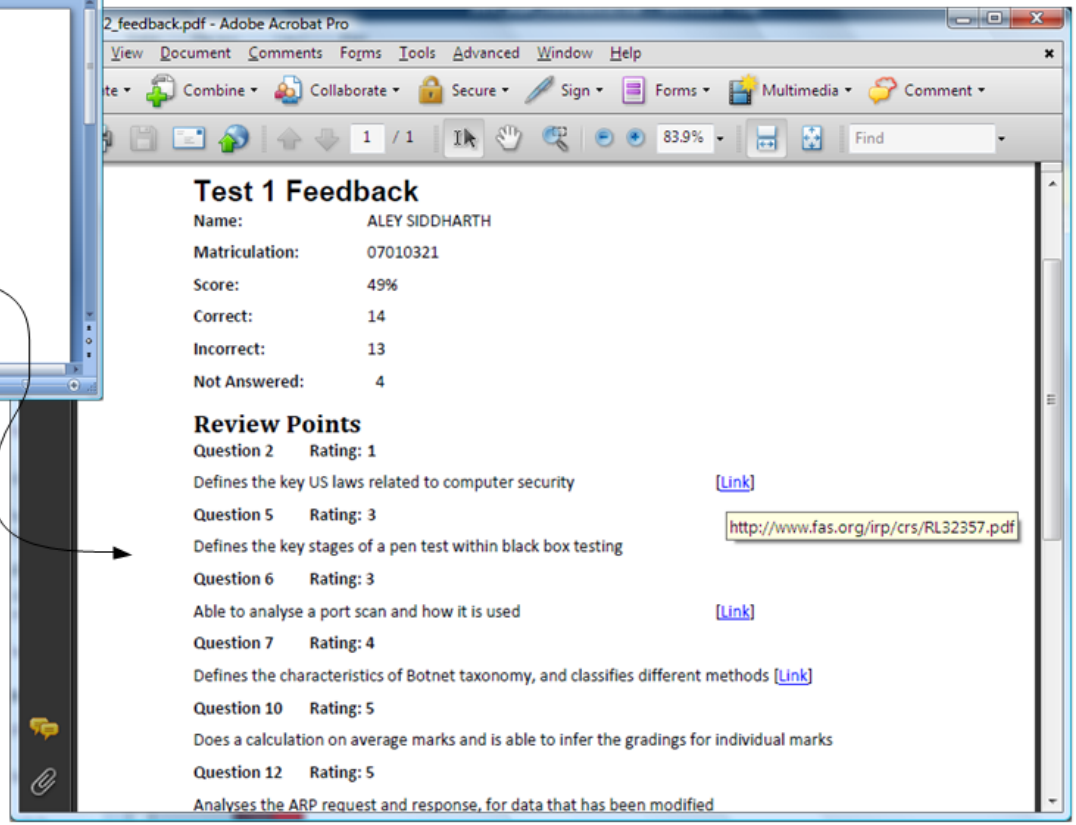
Face-to-face feedback or over MSN Messenger or Skype text within one day of the test. Sometime by email.





- **Emailed to us on the day of the assessment. Awesome.**
- **Bill gives very fast feedback.**
- **Yes. Same day results.**
- **Indeed, concise, and well presented.**
- **Excellent feedback on the tests, very fast and accurate.**
- **And so on.**

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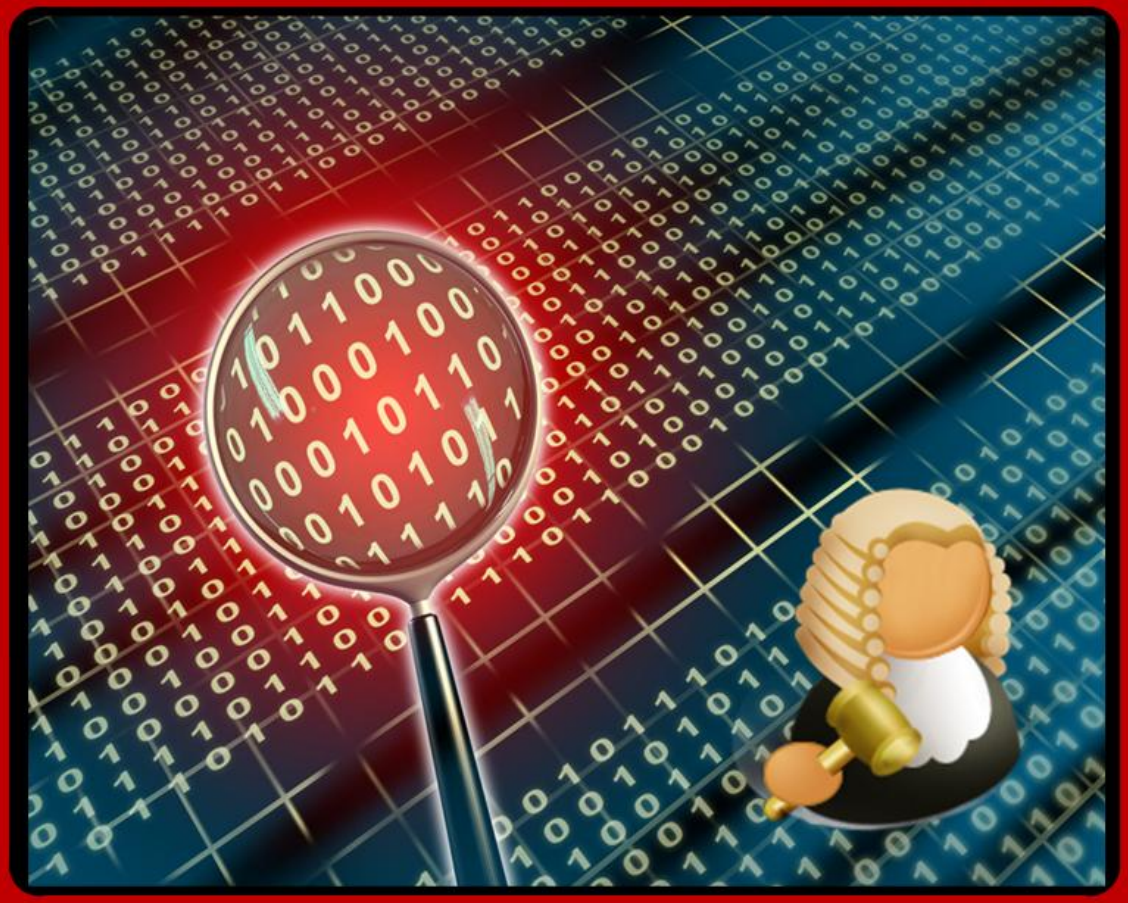
Re-enforcing...



Some results

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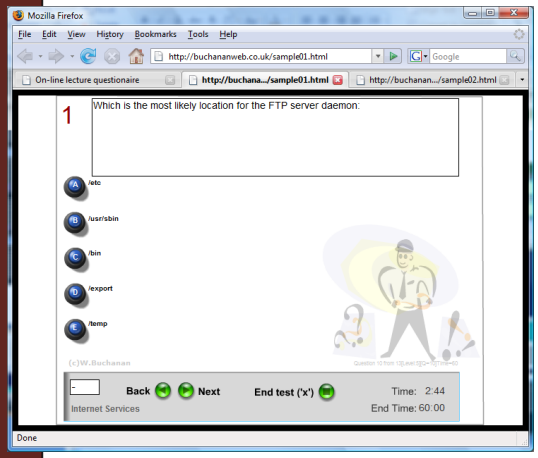
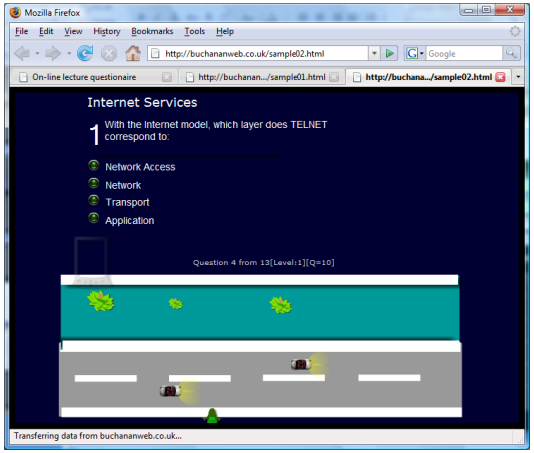
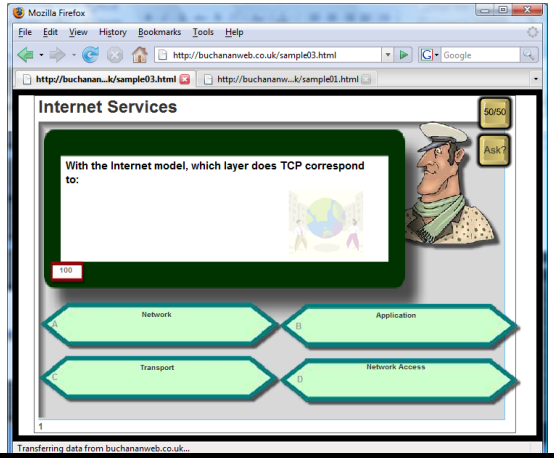
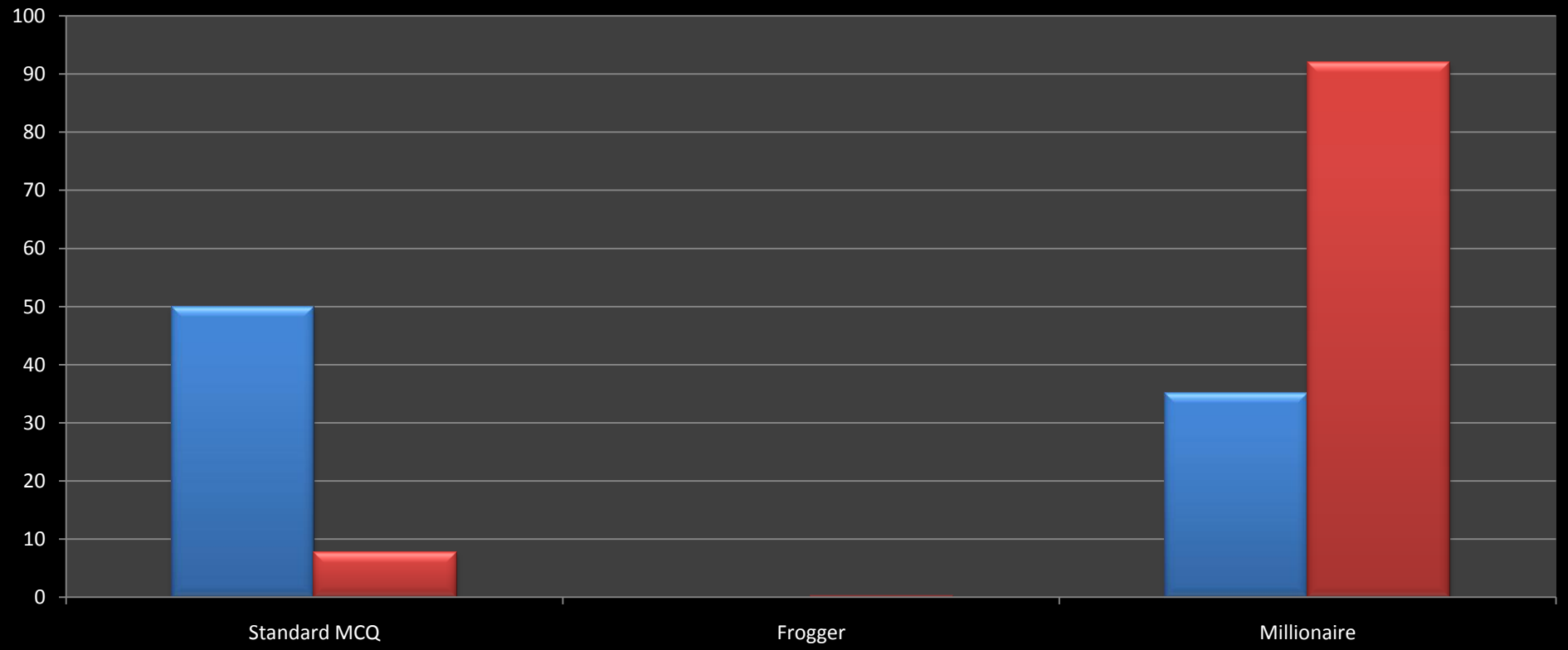


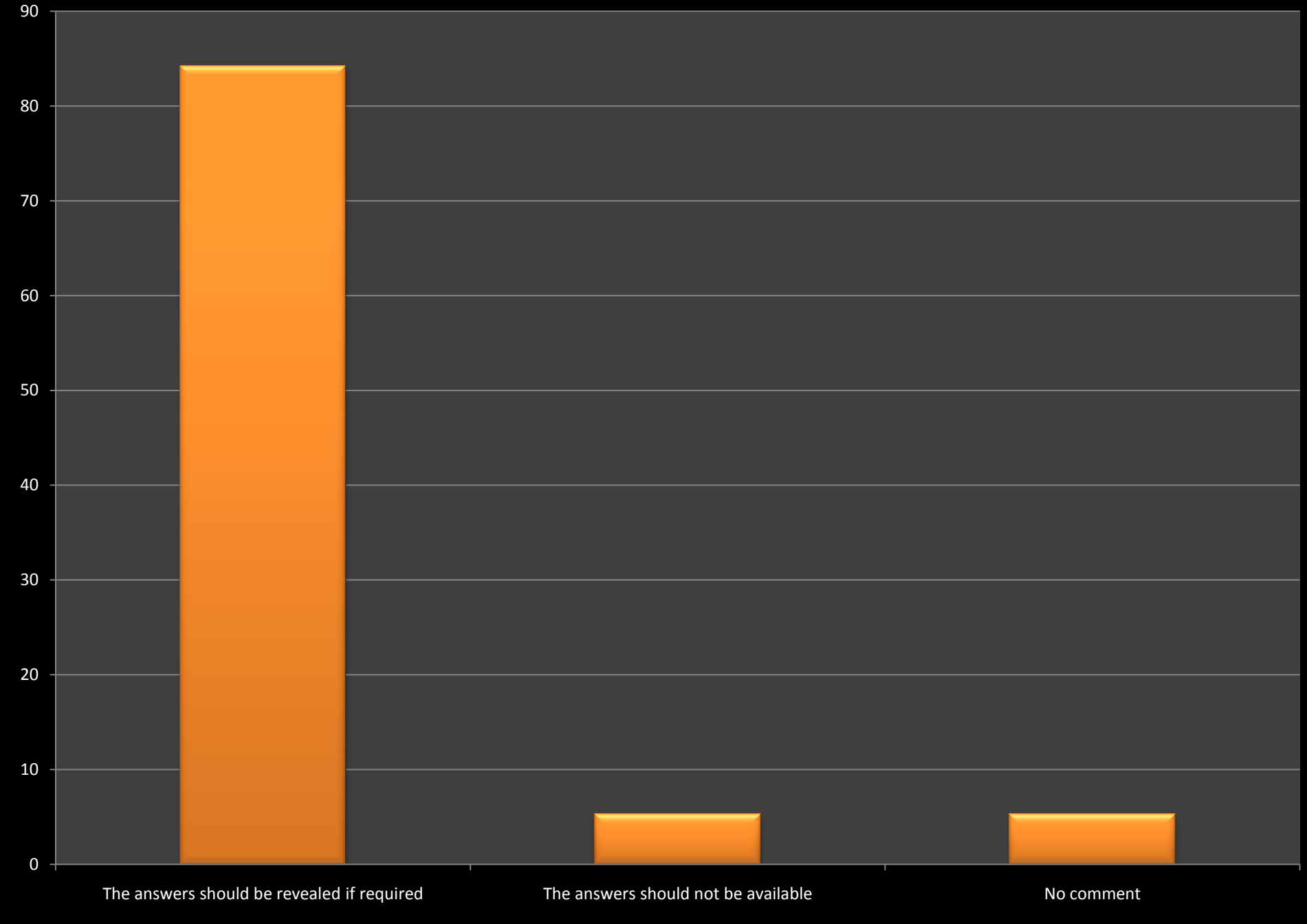


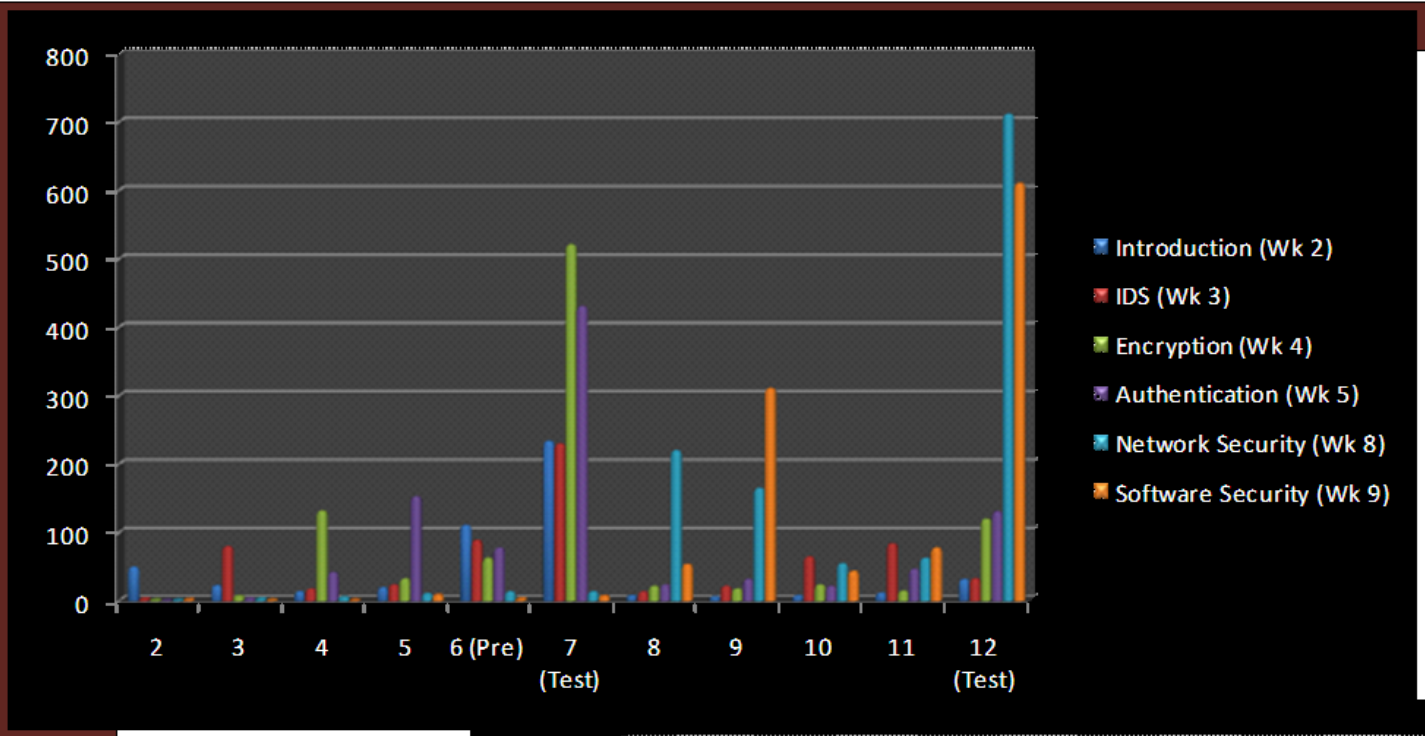


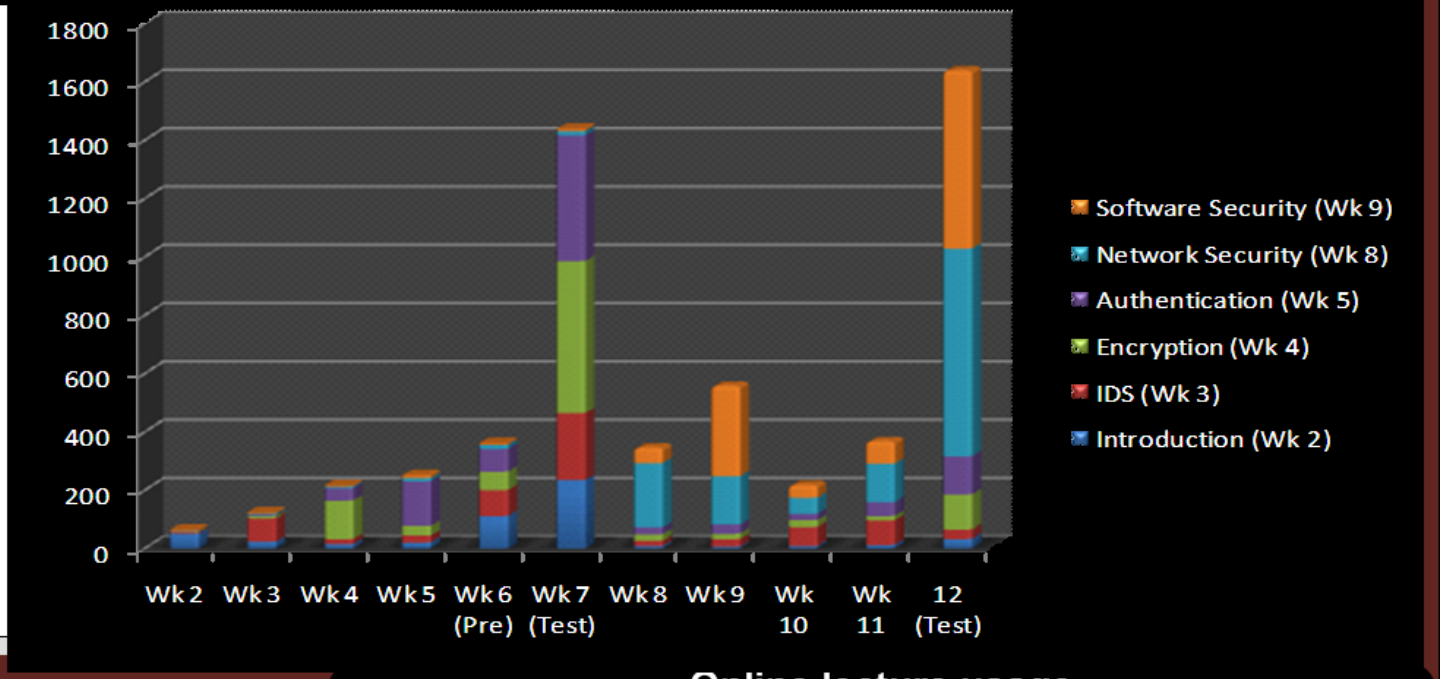
21. Which is the most useful for exam study (/accesses before exam)



23. With on-line tests which should be true:







Online lecture usage

Conclusions

Motivation: To create a scientific approach to testing, that is designed with feedback in mind at every stage.

- Integrated process which integrates students and external examiners.
- Scientific approach, with accurate assessment of performance.
- Students understand what they must study, and have a wide range of test questions.
- Face-to-face creates a bond between the student and academic.
- Itemized learning elements make it easier to analyse overall performance.

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