

DO STUDENTS STUDYING JAVA PERFORM BETTER IN SHORT ANSWER QUESTIONS OR COMPUTATIONAL QUESTIONS? – A CASE STUDY

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Abstract

There are numerous ways to assess students in a written Java test at University level. In this paper we try to determine whether students perform better in short answer type questions which test lower level cognitive skills or computational type questions which test higher level cognitive skills. Our case study is a Time Constrained Assessment for a level 5 module at Northampton University

4. Describe the following terms associated with polymorphism:

- (i) overloading
- (ii) overriding

(2, 1)

5. State the difference between interface and abstract classes

(2)

6. State and define the 2 stereotypes that may be used in a Use Case diagram

(4)

Figure 1: Examples of short answer question

1. Rewrite the following java code so that it uses a *switch* statement rather than *if-else* statements:

```

int season = 4;
if (season==1){
    System.out.println("Spring");
}
else if (season==2){
    System.out.println("Summer");
}
else if (season==3){
    System.out.println("Autumn");
}
else if (season==4){
    System.out.println("Winter");
}
else{
    System.out.println("Invalid season.");
}
  
```

(4)

2. Write a java method called *squared* that takes an integer as an argument and returns the value of the argument squared

(4)

3. Write java code that loops through an integer array called *int_array* of any size and sums up its values.

(5)

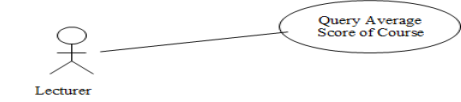
Figure 2: Examples of computational question for java coding

8. Interaction Diagrams show how a set of actors and objects communicate with each other to perform the steps of a use case


Given the following (partial) use case diagram and (partial) class diagram for a University, create a *sequence* diagram to realise the use case.

(12)

(Partial) Use Case Diagram



(Partial) Class Diagram



where both methods return an *average_score* value

Figure 3: Examples of computational question for creating a UML diagram

The TCA was made up of short answer questions and computational questions. Examples of short answer questions are shown in figure 1 and examples of computational questions are shown in figures 2 and 3. Of the 50 marks available for the TCA 35 marks were devoted to computational questions and 15 marks were devoted to short answer questions.

From 73 answer scripts the average mark for the computational questions was 20.47 out of 35 (58.49%) and the average mark for the short answer questions was 4.01 out of 15 (26.73%). This would indicate that students are more than twice more likely to perform better with computational questions than short answer questions.