

End of topic quiz – Topic 2.3 Producing Robust Programs

1.

- a.(i) Maintainability of code allows a team of programmers to work effectively. One way of improving maintainability of code is to use comments. What is meant by using comments in code? [1 mark]

- a.(ii) Why should you use comments in code? Give an example. [1 mark]

- b.(i) Another way of improving maintainability of code is to use indentation. What is meant by indentation? [1 mark]

- b.(ii) Why should you use indentation? Give an example. [1 mark]

2.

- a. Why is it important that a business has robust validation on their registration web page? [1 mark]

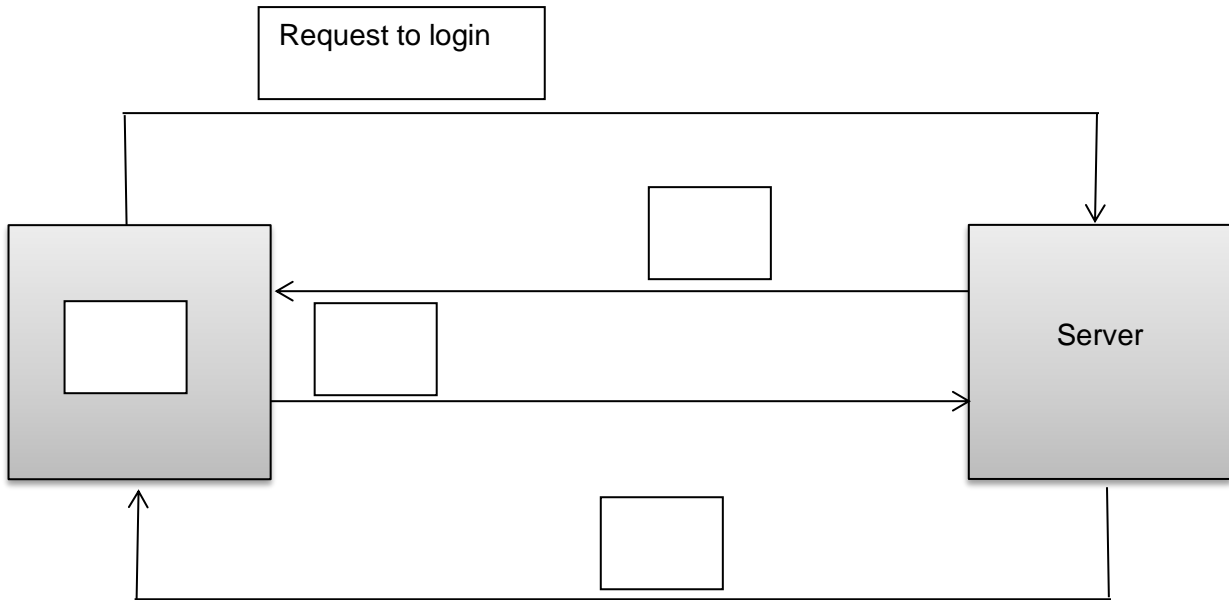
- b. What are **two** examples of validation that a business could implement on their registration page? [2 marks]

3. What are **two** ways that software companies can design computer systems to prevent software misuse? [2 mark]

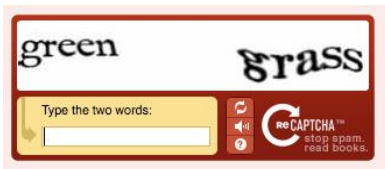
4. The simplified diagram below shows how a user's login credentials are dealt with by a computer system.

Finish the diagram by filling in the blanks using letters from the phrases below. [4 marks]

- A - Approves login request
- B - Client
- C - Request username and password
- D - Send username and password



5. Data capture forms uses captcha authentication technology like the one below:



What is the purpose of using this technology? [1 mark]

6. How does the use of sub programs can improve the maintainability of code? [1 mark]

7. How can the maintainability of the code below be improved? [1 mark]

```
h = input("Please enter Height")
```

```
b = input("Please enter base")
```

```
a = (h * b) / 2
```

```
print a
```

8. The program below outputs the correct size of football for a certain age using the information from the table. The program should also output the circumference and weight.

Age	Circumference (cm)	Weight (g)	Size
<8	58	311	3
9-11	64	369	4
12+	70	425	5

```

01 age = input("Enter an age")
02 if age > 12 then
03     size = 5
04     weight = 311
05     circumference = 58
06 elseif age > 8 and age <= 11 then
07     size == 4
08     weight = 369
09     circumference = 64
10 elseif age <= 8 then
11     size = 3
12     weight = 311
13     circumference = 58
14 endif
15 ball_info = "The correct size is: " + size + " with a
circumference of " + circumference + " and a weight of " +
weight + "."
16 print(ball_info)

```

a.(i) What line is the syntax error is on? [1 mark]

a.(ii) Justify your answer for a(i). [2 marks]

b.(i) What line is the logic error on? [1 mark]

b.(ii) Justify your answer for b(i). [2 marks]

c. What is the purpose of testing? [1 mark]

9.

a. How could a software company use iterative testing to develop an app? [1 mark]

b. How could the software company use final testing to develop the product? [1 mark]

10. Complete the definitions for the types of testing below: [3 marks]

Test data	Reason for use
Normal data	
Invalid data	
Boundary data	

11. John has to write a program to convert exam marks out of 100 to a Grade.

A=80+, B=70-79, C=60-69, D=50-59, E=40-49, F=30-39, G=20-29, U=0-19

Complete the table below by stating the marks to be tested, the reason for test and the expected outcome. The first row has been completed for you [6 marks].

Mark test data	Reason for test	Expected outcome
78	Test a valid input between 0-100 to check the correct grade is output.	B

Answers

1.

- a.(i) Maintainability of code allows a team of programmers to work effectively. One way of improving maintainability of code is to use comments. What is meant by using comments in code?

Explains the actions of a certain block of code.

- a.(ii) Why should you use comments in code? Give an example.

Other programmers can understand what the creator is trying to achieve.
Prevent a block of code from being translated so it can be used later on/to help with spotting errors.

- b.(i) Another way of improving maintainability of code is to use indentation. What is meant by indentation?

Statements shifted (to the right)/Statements which are contained within a block / other statements are preceded by spaces.

- b.(ii) Why should you use indentation? Give an example.

Code can be read easily by other programmers. Easier to test as you can see where code blocks begin and end.

2. a. Why is it important that a business has robust validation on their registration web page?

To ensure that the personal details are correct. If they are incorrect then they will not be of any use.

- b. What are **two** examples of validation that a business could implement on their registration page?

- Email contains @ symbol
- Strong password (mixture of characters, 8-16 characters etc)
- Password verification
- No blank key fields marked with *
- Text only for first name, surname
- Date picker for DOB

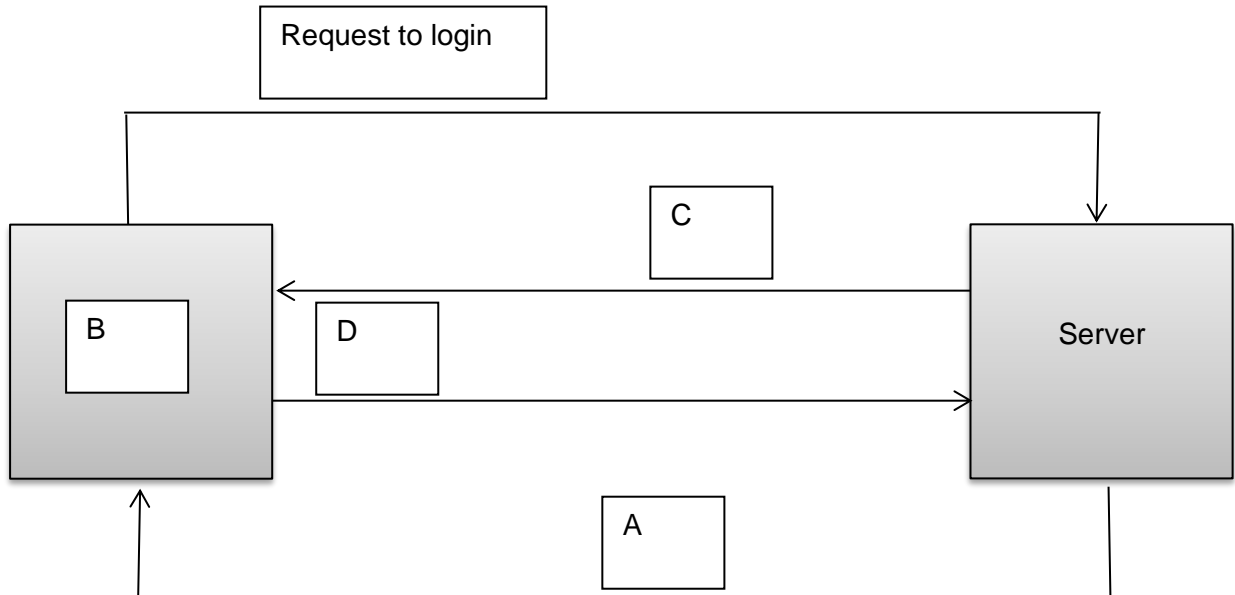
3. What are **two** ways that software companies can design computer systems to prevent software misuse?

Strong passwords
Regular backups
Secure firewall
Data encryption
Set filters on email accounts

4. The simplified diagram below shows how a user's login credentials are dealt with by a computer system.

Finish the diagram by filling in the blanks using letters from the word/phrases below.

- A - Approves login request
- B - Client
- C - Request username and password
- D - Send username and password



5. Data capture forms uses captcha authentication technology like the one below:



What is the purpose of using this technology?

Differentiate between a human and a machine. To ensure that the system is not misused.

6. How does the use of sub programs can improve the maintainability of code?

Provide structure

More readable

Easier to test

Code can be reused

7. How can the maintainability of the code below be improved?

```
h = input("Please enter Height")  
b = input("Please enter base")  
a = (h * b) / 2  
print a
```

Meaningful variables names e.g. Base instead of b

Comments describing what and how the code is performing

Create a function and return a value (area)

8.

The program below outputs the correct size of football for a certain age using the information from the table. The program should also output the circumference and weight.

Age	Circumference (cm)	Weight (g)	Size
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01 age = input("Enter an age")
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15 ball_info = "The correct size is: " + size + " with a
circumference of " + circumference + " and a weight of " +
weight + "."
16 print(ball_info)

```

a.(i) What line is the syntax error is on?

07

a.(ii) Justify your answer for a(i).

Assignment should be = not ==

b.(i) What line is the logic error on?

2

b.(ii) Justify your answer for b(i).

Does not include 12.

c. What is the purpose of testing?

To ensure that the software runs as intended. Identify errors.

9.

a. How could a software company use iterative testing to develop an app?

Testing throughout development after each stage. If faults are found then they are fixed before moving onto the next stage.

b. How could the software company use final testing to develop the product?

Test against the initial requirements. Test for errors after the final solution has been developed.

10. Complete the definitions for the types of testing below:

Test data	Reason for use
Normal data	To test that data that should be accepted is accepted.
Invalid data	To test that data of the correct type but that should not be accepted is not accepted.
Boundary data	This is to ensure that the system allows all data up to the maximum and minimum values that should be accepted.

11. John has to write a program to convert exam marks out of 100 to a Grade.

A=80+, B=70-79, C=60-69, D=50-59, E=40-49, F=30-39, G=20-29, U=0-19

Complete the table below by stating the marks to be tested, the reason for test and the expected outcome. The first row has been completed for you.

Mark test data	Reason for test	Expected outcome
78	Test a valid input between 0-100 to check the correct grade is output.	B
N	Test for erroneous input.	Error message "Erroneous Mark"
130	Test for invalid input	Error message "Invalid Mark"
100	Test a boundary value.	A*

Note – alternative suitable values for erroneous/invalid/boundary data should be accepted. Any two rows from the three provided are required.

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