Digital Solutions marking guide and response

External assessment 2024

Combination response (66 marks)

Assessment objectives

This assessment instrument is used to determine student achievement in the following objectives:

1. recognise and describe programming elements, components of exchange systems, privacy principles and data exchange processes
2. symbolise and explain programming ideas, data specifications, data exchange processes, and data flow within and between systems
3. analyse problems and information related to a digital problem
5. synthesise information and ideas to determine possible low-fidelity components of secure data exchange solutions
7. evaluate impacts, components, and solutions against criteria to make refinements and justified recommendations.

Note: Objectives 4, 6 and 8 are not assessed in this instrument.

Purpose

This document consists of a marking guide and a sample response.

The marking guide:

- provides a tool for calibrating external assessment markers to ensure reliability of results
- indicates the correlation, for each question, between mark allocation and qualities at each level of the mark range
- informs schools and students about how marks are matched to qualities in student responses.

The sample response:

- demonstrates the qualities of a high-level response
- has been annotated using the marking guide.

Mark allocation

Where a response does not meet any of the descriptors for a question or a criterion, a mark of ‘0’ will be recorded.

Where no response to a question has been made, a mark of ‘N’ will be recorded.

Marking guide

Multiple choice

Question	Response
1	C
2	D
3	C
4	D
5	A
6	C
7	B
8	A
9	D
10	A

Short response

Q	Sample response	The response:
11a)	Australian Privacy Principle: 1 Implementation: The hospital must be open and transparent about why it is collecting the data, how the data will be used and disclosed, and who will have access to the data. The hospital must also provide clear guidelines to staff about the collection and use of this information. Australian Privacy Principle: 2 Implementation: The hospital must consider whether it is possible for staff to use a pseudonym instead of their real names when accessing the car park. If this is not practical, the hospital must ensure that it handles the personal information it collects in a secure and confidential manner, and only uses it for the purposes for which it was collected. Australian Privacy Principle: 3 Implementation: The hospital must have a lawful reason for collecting staff driver information and inform staff of the purpose and use of the data collected.	• identifies and explains the implementation of – one Australian Privacy Principle **[1 mark]** – a second Australian Privacy Principle **[1 mark]** – a third Australian Privacy Principle **[1 mark]**

Q	Sample response	The response:
11b)	Confidentiality: The digital solution for capturing numberplate information and staff names poses risks for privacy, as personal data from various sources may be linked in unexpected ways. Only one trusted employee, like an IT manager, should have access to the database, and only after going through a review process approved by the hospital's recruitment and management staff. Information should only be shared between the IT manager and staff member in question, with no other parties privy to conversations or actions taken. Integrity: The data in the database must be error-free, but staff may attempt to abuse the system by providing access to family or friends by lending them their staff ID and obscuring their number plates to gain entry. To prevent staff from logging different numberplates, the system should crosscheck a list of permitted numberplates against IDs before granting access. Availability: The data may be vulnerable to hacking if allowed online, so a MicroSD card should be used for offline access by a trusted staff member. Physical security of the system and SD card should be maintained to prevent staff from damaging or destroying the digital solution. Data should be purged regularly, and the database should be detached and not accessible online. Numberplate data captured by the system should be encrypted and only accessible in extreme cases.	• analyses a risk to data – confidentiality **[1 mark]** – integrity **[1 mark]** – availability **[1 mark]** • makes a recommendation for reducing risks to data – confidentiality **[1 mark]** – integrity **[1 mark]** – availability **[1 mark]**

Q	The response:
12	• symbolises, without logic errors, algorithmic statements for – retrieving JSON data **[1 mark]** – looping through data **[1 mark]** – calculating age **[1 mark]** – calculating percentage won **[1 mark]** – displaying gamer tag **[1 mark]** – displaying age **[1 mark]** – displaying percentage won **[1 mark]** • effectively uses pseudocode conventions **[1 mark]**

Question 12)

Sample response

```
BEGIN
    GET currentDay
    GET currentMonth
    GET currentYear
    SET playerArray = []
    READ json file into playerArray
    FOR count = 0 to playerArray.length
        DISPLAY playerArray[count].gamerTag
        SPLIT playerArray[count].dateOfBirth into birthday, birthMonth, birthYear
        SET age to currentYear - birthYear
        IF currentMonth < birthMonth THEN
            age = age - 1
        ELSE IF currentMonth = birthMonth THEN
            IF currentDay < birthDay THEN
                age = age - 1
            ENDIF
        ENDIF
        DISPLAY age
        CALCULATE percentWon = playerArray[count].gamesWon / playerArray[count].gamesPlayed * 100
        DISPLAY percentWon
    NEXT count
END
```

Get the current day, month and year, which will be used to calculate the player's age.

Initialise player array and read player data from JSON file.

Loop through each player in the array to display the gamer tag, then split the date of birth into separate day, month and year variables to calculate the player's age based on the current date and the player's date of birth to display the age.

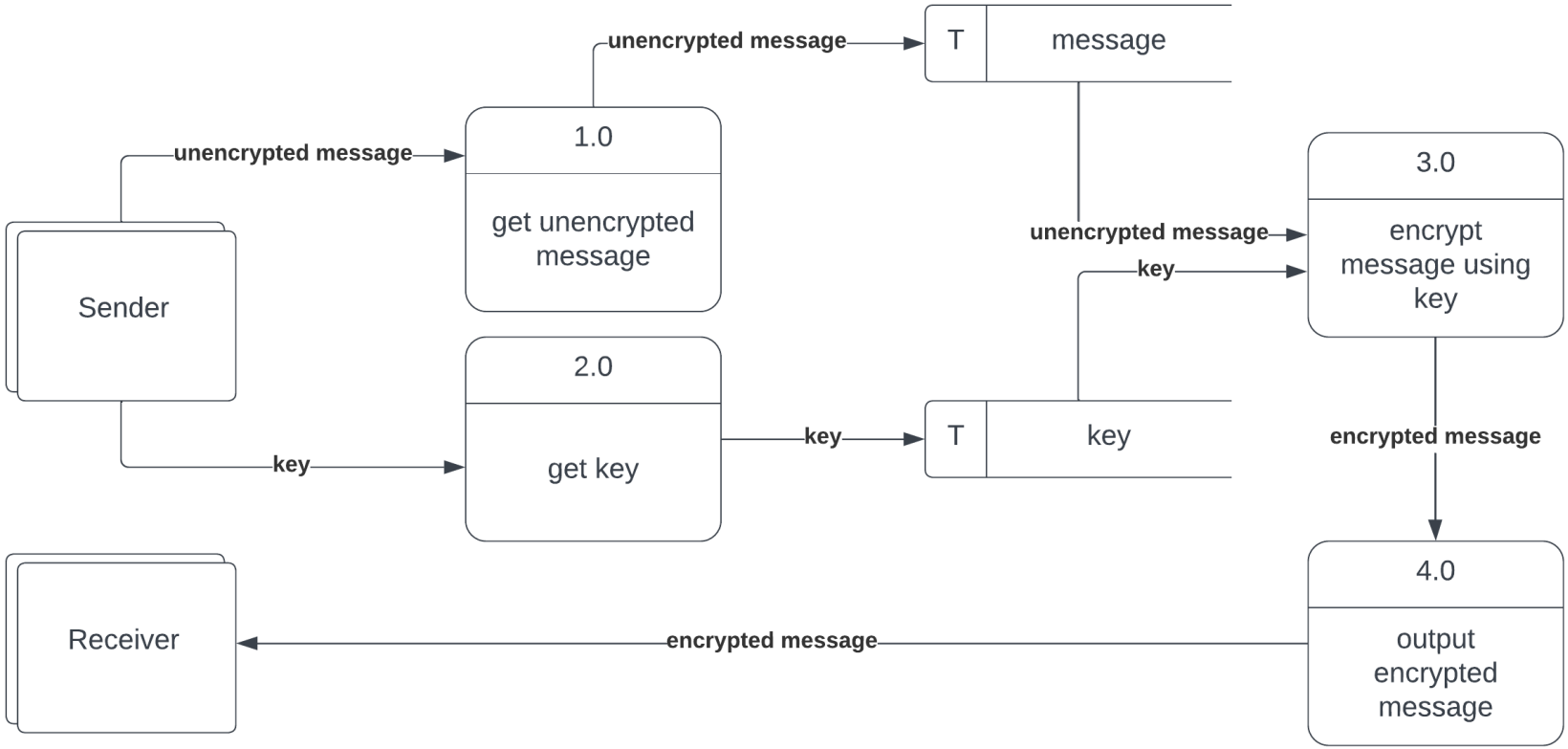
Calculate the percentage of games won by the player based on the number of games played and the number of games won to display the percentage of games won.

Q	Sample response	The response:
13a)	I would use GetRandomFromList(List) to select random items from a list of grocery items to be displayed. ShuffleList(List) does not seem necessary, as once items are randomised, it does not matter in what order they are displayed. GetRandomInt(a, b) requires more effort to code, as grocery or shopping list items would need to be assigned an integer value, whereas GetRandomFromList(List) would simply select an item from a list (e.g. image file or string). The relationship between the selected function and user interface is that the grocery images displayed would be selected by the function at random. The criteria states six grocery items, so the function would need to loop through six iterations — I would need to add programming to ensure there are no duplicates.	• justifies the selection of one code function **[1 mark]** • explains the relationship between the code function and – the user interface mock-up **[1 mark]** – the criteria **[1 mark]**
13b)	User input: A mechanism for user input should be implemented to allow the user to select food items from those displayed. This should be intuitive and easy to use, for example by using buttons, touch controls or keyboard inputs. Feedback mechanism: A clear and immediate feedback mechanism should be implemented to provide feedback to the user on whether their selection is correct or incorrect. This can be done through visual or audio cues, such as a pop-up message, change in colour of the selected item, check mark or tick next to the selected item, or audio feedback.	• recommends – one new programmed component **[1 mark]** – a second new programmed component **[1 mark]** • identifies related user interface elements for – one new programmed component **[1 mark]** – a second new programmed component **[1 mark]** • justifies recommendations for – one new programmed component and related user interface elements **[1 mark]** – a second new programmed component and related user interface elements **[1 mark]**

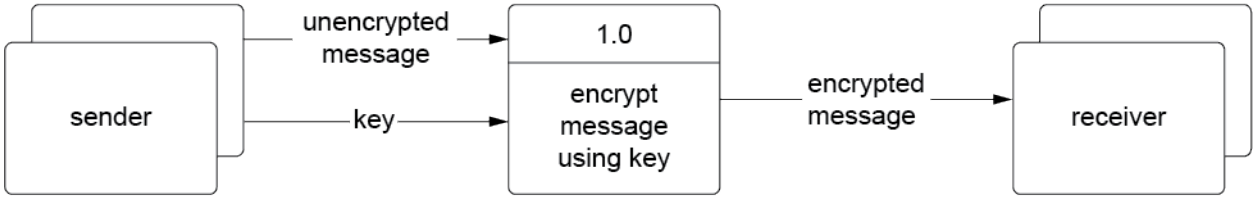
Q	The response:
14	• symbolises an external entity for – one user **[1 mark]** – a second user **[1 mark]** • symbolises a process for – encrypting a message with a key **[1 mark]** • symbolises logical data flows for – an unencrypted message **[1 mark]** – a key **[1 mark]** – an encrypted message **[1 mark]** • symbolises data store or a solution that works without one **[1 mark]** • uses – conventions of the data flow diagram with no errors **[2 marks]** **OR** – conventions of the data flow diagram with 1 error **[1 mark]** • shows overall understanding of the problem with no logic errors **[1 mark]**

Question 14)

Sample response 1



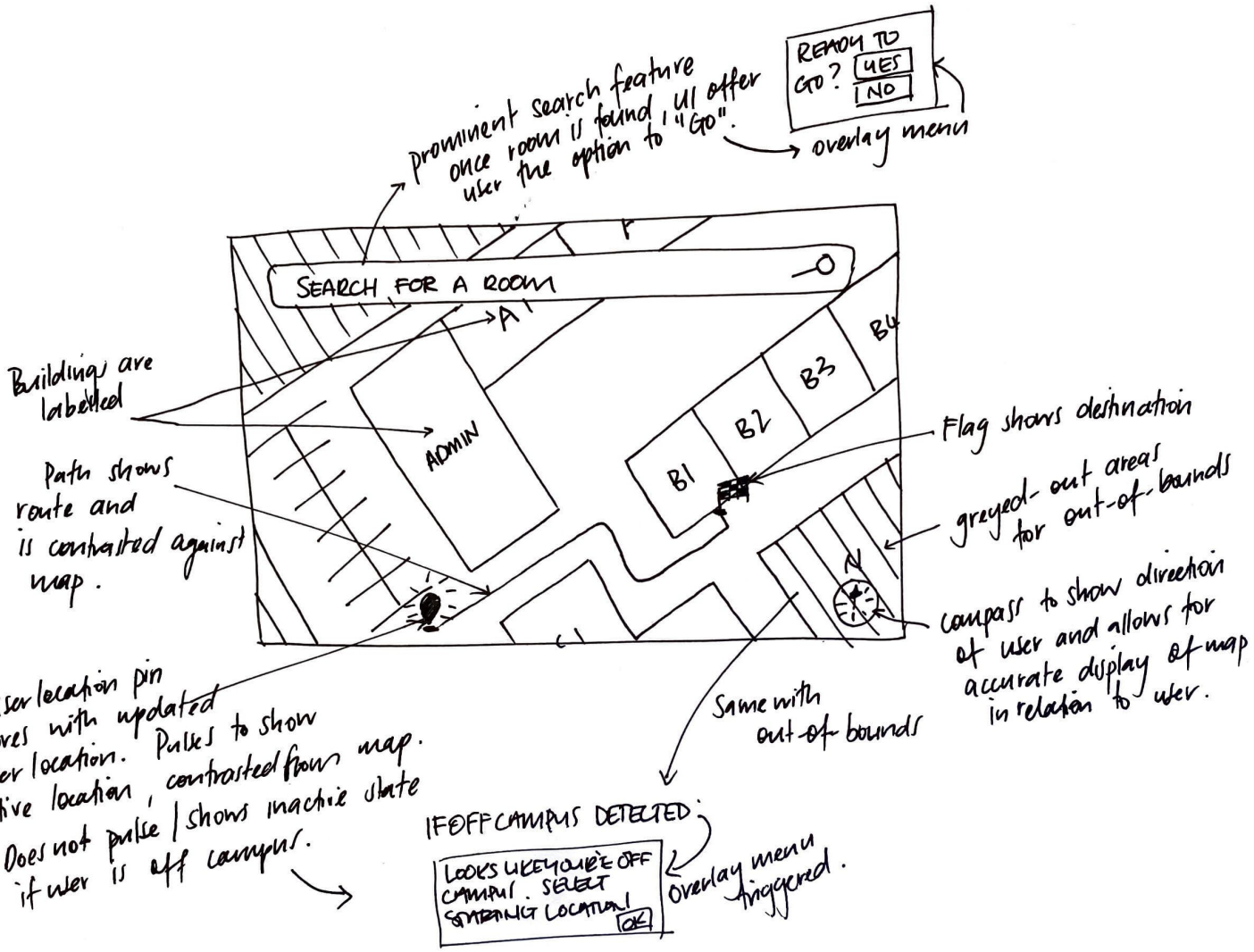
Sample response 2



Extended response: Question 15

Q	The response:	M	The response:	M
15a)	• symbolises user interface elements for all user interface criteria	5	• explains how the user interface addresses all functionality criteria	4
	• symbolises user interface elements for four user interface criteria	4	• explains how the user interface addresses three functionality criteria	3
	• symbolises user interface elements for three user interface criteria	3	• explains how the user interface addresses two functionality criteria	2
	• symbolises user interface elements for two user interface criteria	2	• explains how the user interface addresses one functionality criterion	1
	• symbolises user interface elements for one user interface criterion	1	• does not satisfy any of the descriptors above.	0
	• does not satisfy any of the descriptors above.	0		

Question 15a)



Q	Sample response	The response:
15b)	Visual communication principle 1: contrast – using colours with high contrast in the app will ensure that unique elements stand out and that both the text and map are easy to read for accessibility. Visual communication principle 2: harmony - maintaining a consistent theme by using similar icons e.g. squares / rectangles for buildings and consistent font style and sizes for headings and other elements will help to give the app a uniform and consistent feel.	• identifies – one visual communication principle **[1 mark]** – a second visual communication principle **[1 mark]** • explains how a good user experience could be ensured through the implementation of – one identified visual communication principle **[1 mark]** – a second identified visual communication principle **[1 mark]**
15c)	A possible social need would be for students and staff to interact with each other to share ideas and collaborate on projects to create a sense of community and social connection. If user data is disseminated to unintended parties, it could potentially lead to privacy violations, such as unauthorised access to personal information, and may also put users at risk of identity theft. This could negatively impact the sense of community and social connection that the app is intended to foster. If user data is not stored securely, it could be vulnerable to hacking or other malicious activity, potentially leading to sensitive information being compromised. This could erode trust in the app and the sense of community it aims to build.	• identifies a possible social need **[1 mark]** • evaluates the security impact of user data – dissemination **[1 mark]** – storage **[1 mark]**

Q	Sample response	The response:
15d)	A good security strategy would be implementing access control. Example: use access control measures to limit user access to specific features and data within the app, based on user roles and permissions e.g. school administration staff vs. students vs. visitors would have different levels of access.	• recommends an appropriate security strategy **[1 mark]** • justifies the recommended security strategy with an example **[1 mark]**
15e)	Two new features include personalisation and communication. Personalisation: with user authentication, the app can provide a personalised experience for each user based on their preferences, such as favourite locations or routes, or language settings. Communication: user authentication can facilitate communication between the school and users, such as sending notifications or alerts about school events, updates or emergencies.	• identifies and explains one new feature and functionality **[1 mark]** • identifies and explains a second new feature and functionality **[1 mark]**