VCE INFORMATION TECHNOLOGY

UNIT 2 OUTCOME 2



PROGRAMMING

REVISION NOTES

**Unit 2 Outcome 2**

**Networks**

Be able to recommend a networked information system for a specific use and explain possible security threats to this networked information system.

**Key Knowledge**

**1.** Stages of the **problem-solving methodology**

**2. Data types** and methods of representing and storing text, sound and images

**3.** Methods of representing **solution designs**

**4.** Techniques for **manipulating data and information**

**5. Naming conventions** for files and objects

**6. Testing and debugging** techniques, including construction of test data

**7.** Characteristics of logically constructed **electronic journals**

**8.** Roles and responsibilities of **people who develop and support ICT solutions** within organisations

**9. ICT career opportunities** and pathways

**1.** Stages of the **problem-solving methodology**

**1. Discuss** the four activates that are make up the ‘Development’ stage of the Problem-Solving Methodology

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The first line of code below is an example of ‘internal documentation’

**# Program will calculate the discount and display the total due**

Quantity = input(‘Enter the number of products purchased: “)

Price = input(Enter the price of the product: “)

**2. Explain** the purpose of internal documentation and describe in which activity of the development stage it is created

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**3. Complete** the following table to identify which stage of the problem-solving methodology each scenario would be completed:

|  |  |
| --- | --- |
| **Scenario** | **Stage** |
| Criteria to evaluate if the solution meets the needs are developed |  |
| An algorithm of the proposed program is developed |  |
| The variables required in the program are identified |  |
| The benefits that the new solution will provide users are listed |  |
| A report stating if the solution has been a success is published |  |
| The solution is checked to see that it is working correctly |  |

**2. Data types** and methods of representing and storing text, sound and images

**1. Complete** the following table to identify the type of data shown:

|  |  |
| --- | --- |
| **Data** | **Data Type** |
| 14 |  |
| 14.1 |  |
| Fourteen |  |
| @ |  |
| True |  |

**2. Describe** what is happening, including a discussion of the data type, in the following algorithm:

mark = int(input(“Please Enter Student Mark: “))

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**3. Describe** what is happening, including a discussion of the data type, in the following algorithm:

print(“The mark of the student is: “ + str(Mark))

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**4. Describe** the relationship between character and string data types

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**3.** Methods of representing **solution designs**

**1. Explain** what is meant by the term ‘Algorithm’

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**2. Explain** what is meant by the term ‘Pseudocode’

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Below is an algorithm for a program using pseudocode:

**Begin**

Input Mark 1, 2 & 3

Total = Mark 1 + Mark 2 + Mark 3

Average = Total / 3

If Average <= 50 Then

Result = Pass

Else

Result = Fail

End If

**End**

**3. Describe** the purpose of the program

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**4. Identify** one ‘logic error’ in the algorithm. **Explain** how the error can be corrected

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**4.** Techniques for **manipulating data and information**

**1. Explain** what is meant by the term ‘Syntax’ of a programming language

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**2. Complete** the table below to identify if each item is an ‘operator’, ‘instruction’ or ‘control structure’

|  |  |
| --- | --- |
| **Item** | **Programming Component** |
| > |  |
| print(“Hello Word!”) |  |
| == |  |
| str(Number) |  |

**3. Explain** how an ‘operator’ differs from an ‘instruction’ in a programming language

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**4. Describe** how each of the following ‘control structures’ operate:

|  |  |
| --- | --- |
| **Control Structure** | **Description** |
| Sequence |  |
| Condition |  |
| Repetition |  |

**5. Naming conventions** for files and objects

Peter has used the following variable names in his program – A, B, C, X, Y, Z

**1. Discuss** a program that Peter might encounter while developing his program

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**2. Explain** to Peter why it is important to give variables meaningful names when programming

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**3. Describe** how the naming convention ‘Hungarian Notation’ operates

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**4. Complete** the table below to show how the following variables should be named using Hungarian Notation:

|  |  |
| --- | --- |
| **Variable** | **Variable Name** |
| Variable used to store a customer name | strCustomer |
| Variable used to store the hours worked of an employee |  |
| Variable used to store either true or false depending on if the customer has been in the store recently |  |
| Variable used to store a single letter to represent the House of each student e.g. B for Blue House |  |
| Variable used to store the height of students – in metres |  |

**6. Testing and debugging** techniques, including construction of test data

Lucy has developed the following algorithm for a program:

**Begin**

Enter Height

If Height > 2.0 metres Then

Description = Tall

Else

Description = Short

End If

**End**

**1. Complete** the test table below for the’ actual result’

|  |  |  |
| --- | --- | --- |
| **Test Data** | **Expected Result** | **Actual Result** |
| 1.9 | Short |  |
| 2 | Tall |  |
| 2.1 | Tall |  |

**2. Explain** why the values 1.9, 2.0 and 2.1 were selected to test the algorithm

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**3. Identify** one error in the above algorithm and **explain** how it can be fixed

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A program is been created that requires the postcode entered to be between 3000 and 3999

**4. List** the four best numbers to test to see if the program is working correctly

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Data 1** | **Test Data 2** | **Test Data 3** | **Test Data 4** |
|  |  |  |  |

**7.** Characteristics of logically constructed **electronic journals**

**1. Explain** how an ‘electronic journal’ differs to an ordinary journal

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**2. Discuss** how keeping a journal, when learning programming may be useful?

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Linda is deciding to use either a Blog or a Wiki to document her learning process when beginning programming

**3. Explain** to Linda how a Blog differs from a Wiki

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**4. Select** which type of journal is more appropriate. **Justify** your answer

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**8.** Roles and responsibilities of **people who develop and support ICT solutions** within organisations

**1. Complete** the table below describing a range of ICT careers:

|  |  |  |  |
| --- | --- | --- | --- |
| **Job** | **Tasks**  **Undertaken** | **Personal Requirements** | **Entry Requirements** |
| IT Teacher | Develop learning materials and run classes | Brilliance & Patience | University degree and teacher qualification |
| Desktop Publisher |  |  |  |
| Web Designer |  |  |  |
| Network Manager |  |  |  |
| Programmer |  |  |  |
| IT Manger |  |  |  |
| Project Manager |  |  |  |

2. Using the internet as a resource, **find** recent ‘news’ articles about the number of computer gaming jobs available in Australia. **Write** a summary of the article

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**9. ICT career opportunities** and pathways

**1. Complete** the table below explaining how the following courses at Monash University differ:

<http://www.monash.edu.au/study/options/courses/information-technology.html>

|  |  |  |  |
| --- | --- | --- | --- |
| **Course** | **ATAR** | **Pre-Requisites** | **Description** |
| Business Information Systems |  |  |  |
| Computer Science |  |  |  |
| Software Engineering |  |  |  |
| Information Technology and Systems |  |  |  |

**2. Discuss** the advantages of Industry Based Learning (IBL) at university

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**3. Explain** what is meant by a ‘Double Degree’

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