IGCSE Computer Science Assignment Twelve

EXAM PRE-RELEASE MATERIAL

Please make sure to read the pre-release material before attempting these questions.

IMPORTANT NOTE: For this assignment, your submission needs to be in the form of a Word document, NOT a PDF.

1. Before you can do much in the way of coding, you will need to create and assign some variables. These will include variables for the number of the boat (from 1 to 10), the payment made for hiring a boat, length of hire, start and end times of a hire, the availability of a certain boat, and running totals for the money taken during the day and the number of hours each boat has been hired for. You may think of others. For each one, create a variable in your code and assign it an initial value (this may be empty quote marks if you are using a String data type).

   Remember – variable names must be meaningful. You will lose marks if they are not. For example, *boat_number* is meaningful; *x* is not.

   [6 marks]

2. For Task One in the pre-release material, write pseudocode to deal with the hiring of one boat. You will need to consider the following:

   a. A boat may be hired for either one hour or half an hour. You may use 60 and 30 minutes if you prefer, but don't forget you will need to convert this back to full and half hours for outputting the total hours hired for the day.

   b. Totals for hours of hire and money taken will need to be updated and added to every time a boat is hired. An 'if' statement should be used to add $12 for each 30 minute hire, and $20 for each 60 minute hire. At the end of the day, the system must be able to output the final totals for the day.

   c. The user will input the start time and length of the hire; the system should then output the time the boat is due to be returned.

   d. Once the boat has been hired, its availability should be set to False for the duration of the hire, and reset to True once it has been returned.

   e. A hire cannot start before 10:00 and cannot finish after 17:00 (so therefore cannot start after 16:30). If a hire starts between 16:00 and 16:30, the system should only accept a 30 minute hire.

   f. For any input which may cause an error (eg a length of hire that is not 30 or 60 minutes, a start time and length that would result in a return time past 17:00 etc), a the system should issue a suitable error message and prompt the user to re-enter the information.

Show your pseudocode as it stands at this point in your Word document.

[12 marks]

3. For Task Two, use loops and a list or dictionary in your pseudocode to extend the system to deal with the hiring of up to 10 boats.

[3 marks]

4. Add to your pseudocode to represent the following requirements:

   a. The system should request an input of the start time of the hire and return a list of the boats that are available at that time. If no boats are available (all have an availability of False), the program should return the earliest time at which a boat will be due, and ask the user if they wish to proceed or cancel the booking.

   b. Once a boat has been hired, the user should be prompted to either hire another boat, or end the procedure.

Show the updated pseudocode in your Word document. You can if you wish just show the part with the amendments.

[5 marks]

5. For Task Three, create a flowchart diagram to deal with the end of day report:

   a. For each boat, the system must first determine if a particular boat has been hired that day. If it has, the number of hours for that particular boat will be added to the total for the day and the cost will be added to the total takings. If has not been hired, it will appear in the report as an "Unused boat".

   b. The system should look through the list/dictionary of boats and their number of hours hired and output which boat has been hired for the most time that day.

   c. The system should then ask the user if they wish to print a report which will cover these issues as well as printing out the total hours hired for each boat, the total number of hire hours for the day, and the total money taken.

[9 marks]

6. Write Python code to achieve the requirements of all tasks, based on your pseudocode and flowchart. **Please see Question 7 before you start.**

When finished, the entire code should be copied and pasted (NOT a screenshot) into your Word document.

[5 marks]

7. Draw up a test table for your program, with the columns as below, with you filling in the four blank columns. **This is a full testing table, so should be used <u>in conjunction with your coding</u>, not left until afterwards. This way, you will be better able to document anything that goes wrong and use the Actions / Comments column to state how you fixed the problem.**

   You will need to test **thoroughly**, for every eventuality – you will probably do this anyway in the course of creating your program, so you just need to document it. For example, when testing the start time, you should try normal data that should pass (such as 12:00), abnormal data that should fail (such as 22:30), and extreme data that should still pass (such as 16:00). You will also need to test to make sure that a hire between 16:00 and 16:30 can only be for 30 minutes.

Item Tested	Data Entered for Test (where necessary)	Expected Result	Actual Result	Actions / Comments (where necessary)

[20 marks]

TOTAL FOR ASSIGNMENT 60 MARKS