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| ICA SPECIFICATION |

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| Module Title:  **Java Programming** | Module Leader: **Zafar Khan**  Module Tutor: **Whitney Berndt** |
| Module Code: **CIS1010-N** |
| Assignment Title:  **Contract Manager Prototype** | Deadline: **Part A: 17 Jan 2018 23:59**  **Part B: 17 Jan 2018 23:59** |
| **Submission Method:**  Middlesbrough Tower  Online |

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| **Central Assignments Office (Middlesbrough Tower M2.08) Notes:**   * All work (including CDs etc) needs to be secured in a plastic envelope or a folder and clearly marked with the student name, number and module title. * An Assignment Front Sheet should be fully completed before the work is submitted. * When an extension has been granted, a fully completed and signed Extension form must be submitted to the SCMA Reception. |

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| **Online Submission Notes:**   * Please follow carefully the instructions given on the Assignment Specification * When an extension has been granted, a fully completed and signed Extension form must be submitted to the SCMA Reception. |

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| **FULL DETAILS OF THE ASSIGNMENT ARE ATTACHED**  **INCLUDING MARKING & GRADING CRITERIA** |

**Telephone Contract Manager Prototype**

## Background

A small communications company requires a simple telephone contract manager prototype to demonstrate key features. The company offers the following packages:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Monthly Rates (in pence)** | | | |
| Package | Data Bundle | | | |
| Low 1GB | Medium 4GB | High 8GB | Unlimited |
| Small 300 mins | 500 | 700 | 900 | N/A |
| Medium 600 mins | 650 | 850 | 1050 | N/A |
| Large 1200 mins | 850 | 1050 | 1250 | 2000 |

Notes:

* Contract periods can be 1, 12, 18 or 24 months.
* Each contract has a reference number (e.g. JB123B – Two letter followed by three digits and a letter. The last letter can only be B for Business Account or N for Non-Business Account).
* Business customer receive a 10% discount and must take at least a 12-month contract.
* Non-business customers taking a 12 or 18-month contract receive a 5% discount and 10% for a 24-month contract
* International calls are normally charged separately, but customers can choose to use the minutes included with package to make these calls. If this option is selected, the charges above are increased by 15%.
* All calculations are performed on the pence values and decimal portion disregarded.
* Contracts details also include the client name (eg: J Mason) – maximum of 25 characters

When required, summary outputs should be displayed using the following format:

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| Customer: J Mason |

| |

| Ref: JB123B Date: 15 Oct 2017 |

| Package: Large (1200) Data: Low (1GB) |

| Period: 12 Months Type: Business |

| |

| Discount: 10% Intl. Calls: No |

| |

| Discounted Monthly Charge: £7.65 |

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Notes:

* Monthly charge is centred and the word discounted **only** appears if a discount has been applied.
* If discount is not applied, the word None should be displayed instead of the percentage value.
* The border should be included with the summary.

## Requirements

A prototype console application (no GUIs or GUI dialogs) is required. Your prototype should display a menu similar to the following:

1. Enter new Contract

2. Display Summary of Contracts

3. Display Summary of Contracts for Selected Month

4. Find and display Contract

0. Exit

Once an option is selected and processed, the menu should be redisplayed until the exit option is selected. Each operation is described below:

* **Option 1: Enter new Contract**
* Ask the user for the inputs: client name, package, data bundle, reference, period and include international calls. Alternatively, the estimated minutes and data (megabytes) can be entered and the program automatically selects the appropriate package and data bundle. Note: All inputs should be validated.
* Calculate the total and discounted prices for the contract.
* Display the summary (it **must** use the format in the example).
* Save (append) the data for the contract to the text-based summary file (contracts.txt). Each line in the file must hold the details for a single contract with the following information separated by spaces or tabs:
* Contract Date (today’s date - see technical details for format).
* Package (1=Small, 2=Medium and 3=Large)
* Data Bundle (1=Low, 2=Medium, 3=High and 4=Unlimited).
* Period in Months
* Allow international call from package minutes (Y or N)
* Reference Number.
* Monthly Charge (in pence).
* Client Name.
* **Option 2: Summary of Contracts**

User is asked to select the main (contracts.txt) or archive (archive.txt) contacts and a summary of the following is displayed:

* Total number of contracts.
* Number of contracts with High or Unlimited Data Bundles.
* Average charge of large package contracts.
* Total number of contracts per month (assume the files only include data for the current year). Show an entry for all twelve months even those that have an entry of zero.

A sample archive file can be downloaded from Blackboard. For the supplied archive file, the output should look similar to the following:

Total Number of contracts: 1000

Contracts with High or Unlimited Data Bundles: 300

Average charge for large packages: 12.77

Number of contracts per Month:

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

91 67 83 84 103 71 103 68 80 65 99 86

* **Option 3: Summary of Contracts for a Selected Month**

The user is asked to select the main or archive contracts and to enter a month. A summary of contracts (as specified in option 2) should then be displayed for the specified month.

* **Option 4: Find and Display Contract**

The user is asked to select the main or archive contracts and enter the search text. The selected file should be searched for any matches (full or partial) against the reference or client name. For example entering **DE** would match against reference number “**DE**123N” and Client Name “C San**de**rson”.

For each matching entry, the contract summary (see option 1) should be displayed.

* **Option 0: Exit**

Display an appropriate message and exit the application.

## Test Requirements

As well as developing the prototype, the client requires a test plan for the application that demonstrates how each feature will be tested to ensure that it performs as expected. The test plan should use the following format:

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| --- | --- | --- | --- |
| **Description** | **Values / Input** | **Expected outcome** | **Actual outcome** |
|  |  |  |  |
|  |  |  |  |
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Once the test plan has been completed, use it to check your design and application. If any of the tests fail, update your application and re-test (keep the original entry that failed in the plan along with the new entry for the re-test).

## Technical Information

1. Name your project **ContractManager**.
2. Data files must be named **contracts.txt** and **archive.txt**. A sample of the archive file can be downloaded from the Assessment section of the blackboard module.
3. The implementation must include a Contract class that represents a single contract. This class should use appropriate encapsulation and not include any keyboard input or console output.
4. The following method will get today’s date:

public static String getDate()

{

Calendar cal = Calendar.getInstance();

SimpleDateFormat sdf = new SimpleDateFormat("dd-MMM-yyyy");

return sdf.format(cal.getTime());

}

You will need to import **java.util.Calendar** and **java.text.SimpleDateFormat;**

1. Internally use integers for monetary values (hold them as pence). Display as pounds and pence by dividing the value by 100 and using the printf method to display – for example:

System.out.printf("£%.2f ", amount / 100.0);

1. The prototype must be developed in NetBeans.

## Tasks and Marking Criteria

**Part A**

**1. Menu and Enter New Contract (Option 1) Data Input and Validation [30%]**

Marks will be awarded for:

* Adherence to the requirements.
* User friendly and effective validation.

**2. Testing [10%]**

Develop the required test plan and use it to test the prototype application. Marks will be awarded for:

* Suitability and range of tests.
* Documentation of actual outcomes.

**Part B**

**3. Summary of Contract (inc. Selected Month version) [20%]**

Implement the logic required, read the data from the appropriate file and display the appropriate information.

**4. Find and display Contract [5%]**

Implement the logic required to search the appropriate file and display the matching contract summaries.

**5. Code Efficiency and Documentation [25%]**

The code in your application should:

* Be well commented (no superfluous comments) using professional language.
* Be consistently indented, making good use of blank lines.
* Use suitable identifiers, adopting the house style conventions
* Use appropriate object-oriented techniques (data encapsulation).
* Be as efficient as possible (no unnecessary repetition of code), well designed, using internal methods and arrays where appropriate.

**6. Report [10%]**

Your client is considering implementing the full system and would like your advice on the following:

* What security measures/features would need to be implemented to ensure the data in the system was safeguarded.
* What legal considerations need to be taken into account before the full system becomes operational?
* How could development and implementation risks be minimised?
* Current state of the prototype:
  + Which parts have been successfully implemented and those parts which have not been fully successful.
  + A description of any known errors.

Your advice must be documented in a brief professional business report (approximately 500 words) and submitted with the prototype.

## General Notes/Advice

* DESIGN your solution using pseudo code or flow charts. Resist the urge to start hacking away immediately.
* Save frequently and backup your work every day.
* Work methodically and proceed using small steps.
* Work individually. Your code will be checked for plagiarism.
* **You are strongly advised to retain all versions of your code and your development notes, so that you can show the development of your work. This may be required as evidence in the event of any query about the authorship of your work.**

## What to Submit

Your assessment work must be submitted electronically as a single zip file to the module support site on Canvas. The zip file must contain the code, data files, test plan and report and be named K1234567-ICA (where K1234567 is your user id).

Further instruction on uploading your work will be provided closer to the submission date.

**IF THE ZIP FILE IS UNREADABLE OR BLANK YOU WILL RECEIVE A ZERO MARK! Once you have completed the upload, download the file to check its contents.**