



University
of Glasgow

PHYSICS 2T
C Programming under Linux
Practical Exam
14:00-16:00, 23rd March 2021

Candidates should answer:

- Question 1 on C programming [20 marks];
 - Question 2 on C Linux [20 marks].
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- Submission of work is via Moodle, and students are required to submit one file with a solution to Question 1 and one file with a solution to Question 2.
 - Submitted files should be named after you Matriculation Number i.e.:
 - 9504332.c
 - 9504332.sh
 - All submissions should be uploaded within the 2-hour window of the exam.
 - You may use external sources of information in this exam, but if actual code is taken from these sources, they must be cited appropriately.
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Question 1:

This is an exercise to manipulate a text string read in from the keyboard. Take the following steps:

- 1) Create a main program to read in a lowercase text string from the keyboard. [4]
- 2) Include suitable header files and comments in your program. [3]
- 3) Convert the first and last letter of the input stream from lowercase to capitals and print the result to the terminal. [6]
- 4) Create a copy of the modified string and replace any occurrence of the character 'e' with the character 'x'. [4]
- 5) Write the modified string to a file called output.dat [3]

Example: If the string read in from the keyboard is "abcdefg", the capitalised string printed to the terminal should be "AbcdefG" and the modified string written to the file should be "AbcdxfG"

Continued overleaf

Question 2:

The “Penny” is a newly minted crypto currency traded by brokers with all trades being tracked by “The Planetary Penny Exchange”, which can be found here (please note it can only be accessed from Brutha or by using the University VPN service):

`http://interocitor.ppe.gla.ac.uk:3000`

A list of trade quantities for a given broker can be obtained using the trades URL (web address) below, where **USER** (in the example below) would be the 4-character code of a specific broker, for instance **VNHI**.

```
[brutha]$ curl -s http://interocitor.ppe.gla.ac.uk:3000/trades/USER
```

```
[brutha]$ curl -s http://interocitor.ppe.gla.ac.uk:3000/trades/VNHI
```

```
1
```

```
90
```

```
3
```

You are to write a script to collect the trades of 4 brokers with **USER** codes: **VNHI**, **NHSY**, **TDYN**, **PXSC**, store the trade data retrieved in a file named after each broker and find the largest trade quantity in each file. Your script must:

- 1) Correctly comment your code. [3]
- 2) Include the correct interpreter directive. [1]
- 3) Create a directory called **data** to store trade information. [1]
- 4) Test to ensure the directory was created and, if not, exit with an error. [2]
- 5) Loop over each of the 4 brokers and:
 - a. Obtain a list of all the trades made by each broker and store those trades in a variable **TRADES** [4]
 - b. For each set of trades loop over the values obtained and append each value to a file named **data/USER** where **USER** is one of the broker codes. [4]
- 6) Write a function that takes as an argument a filename and prints the maximum number in the file. Call this function on each generated user file. [4]
- 7) At the end of the script exit with a successful status. [1]

End of question paper