SAMPLE LAB EXAM (Deadline Monday 14 February 23:59)

Before starting

- The exam runs 1400-1550.
- Answer all questions.
- Upload all code to Einstein.
- All lab exam rules apply.
- To pass all tests submit from L101, L114, L125 or L128.

Question 1 [25 marks]

- Jimmy loves chocolate. It's all he eats. Once he starts a bar he must finish it.
- Each bar of chocolate contains 400 calories.
- Write a program called *chocolate_052.py* that reads from `stdin` an arbitrarily long list daily calorie requirements for Jimmy (one per line).
- Each calorie requirement is an integer in the range 0-100,000.
- For each line read your program should output an integer representing the minimum whole number of bars of chocolate Jimmy must eat to satisfy his calorie requirement on that day.
- For example:

```
$ cat chocolate_stdin_00_052.txt
300
800
```

```
$ python3 chocolate_052.py < chocolate_stdin_00_052.txt
1
2
```

Question 2 [25 marks]

- A poker hand consists of five unique cards drawn from a standard 52-card deck.
- Each card is represented by two characters. The first character is the rank of the card which is one of *A23456789TJQK*. The second character is the suit of the card which is one of *CDHS*.
- The strength of a hand is the maximum value k such that there are k cards in a hand that have the same rank.
- Write a program called *poker_052.py* that reads a line of text representing a poker hand from `stdin` and outputs its strength.
- For example:

```
$ cat poker_stdin_00_052.txt
AC KD KS KC 3H
```

```
$ python3 poker_052.py < poker_stdin_00_052.txt
3
```

- For example:

```
$ cat poker_stdin_01_052.txt
4H 5C 4C 5S AC
```

```
$ python3 poker_052.py < poker_stdin_01_052.txt
2
```

Question 3 [25 marks]

- Write a program called *`uppers_052.py`* that reads strings from `stdin` (one string per line).
- Each string is a sequence of upper and lower case characters.
- Your program must print the longest sequence of contiguous upper case letters contained in each string.
- You can assume the length of the longest sequence is positive and unique.

```
$ cat uppers_stdin_00_052.txt
aBc
AbcdEFGHIjk
```

```
$ python3 uppers_052.py < uppers_stdin_00_052.txt
B
EFGHI
```

Question 4 [25 marks]

- Runners run some arbitrary number of races (at least one) in a season.
- Write a program called *`race_052.py`* that reads runners' race times for the season from `stdin`.
- Each line read from `stdin` is structured as follows: *Runner's_name time_1 time_2 time_3 …*
- Each name is a single string.
- Each time is in the form *minutes:seconds*.
- Your program must print the name of the runner with the best race time over the course of the season along with that time (you may assume there will always be a clear winner).
- Should any of the times be invalid then the corresponding runner should be ignored.

```
$ cat race_stdin_00_052.txt
Rachel 8:12 8:32 8:00 7:12 8:09
Fred 11:12 11:13 11:14 11:14 11:10
Naomi 8:45 9:01 10:11 8:18 9:00
Jimmy 8:12 8:2b 8:19 7:13 10:11
Ned 7:34 7:00 6:45 7:19 7:01
```

```
$ python3 race_052.py < race_stdin_00_052.txt
Ned : 6:45
```