

Coursework Administrative Details

Module/Lecture Course:	Introduction to Business Analytics (COMP41815)
Deadline for submission:	14:00 Tuesday January 9, 2024
Deadline for marks and feedback to be returned to students:	14:00 Tuesday February 5, 2024
Submission instructions:	
Submission file type(s) required:	Part 1: a python file named game_userid.py or game_userid.jpynb Part 2: a python file named shares_userid.py or shares_userid.ipynb Part 3: a pdf file named userid.pdf with 1500-word limit
Format:	A Zip file with the above files
Contribution:	100%

In accordance with University procedures, **submissions that are up to 5 working days late will be subject to a cap of the module pass mark**, and **later submissions will receive a mark of zero.**

This does not apply for resit submissions as a 2nd attempt. For such resits, late submissions receive an automatic mark of zero.

Content and skills covered by the assignment:

- Be able to write computer programs in python, especially how to define and call functions, and use list, if statement, for and while loop
- Be able to select appropriate data structures for modelling business scenarios
- Be able to evaluate the complexity of an algorithm
- Be able to use appropriate tools to manage source code
- Be able to use appropriate tools to test code automatically
- Effective written communication
- Planning, organising and time-management
- Problem solving and analysis
- To examine and understand how British airways attempt different business and corporate strategies to achieve or maintain a competitive advantage

- Be able to give an in-depth analysis of BA strategy and implementation under conditions of changing political, economic, sociocultural, and technological conditions, industry competition and firm resources.
- To be able to critically evaluate change of management in relation to organisation stock prices and provide alternative suggestions to managerial decisions
- Be able to apply various theoretical frameworks effectively
- Understand various corporate strategies of effective organisation and maintaining a competitive advantage
- Be able to critically assess and examine various corporate strategies
- Be able to critically analyse the non-market environment of business on firms, such as the strategic constraints and opportunities presented by socio-cultural and political developments
- Be able to conduct an in-depth industry analysis and gain advanced understanding of its strengths and limitations

General Requirements

Part 1: Medialib mini game [30 marks]

Make use of the images saved in the folder named MazeGame_imgs (as shown in Figure 1) to design a mini game by completing the game.jpynb using medialib. Apply the knowledge of **list**, **if** statement, **for** and **while** loop for this task.

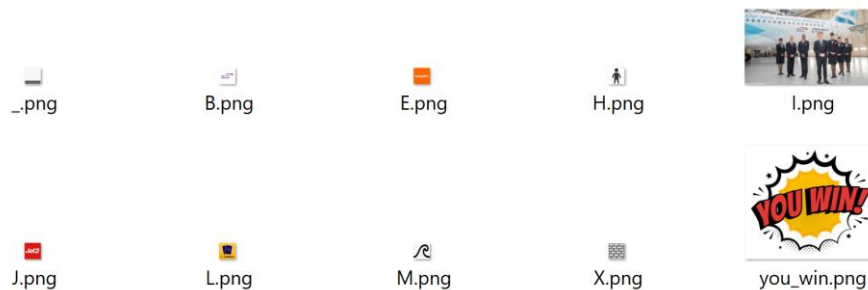


Figure 1

The requirement is as follows.

1. **[5 marks]** The List representing the initial background of the game is

```
[['X','X','X','X','X','X','X','X','X','X','X','X','X','X','X','X','X'],
 ['X','_','_','L','_','_','M','_','_','E','_','_','J','_','_','_','X'],
 ['X','_','_','_','M','_','B','_','_','L','_','_','_','_','B','_','J','_','X'],
 ['X','_','_','B','_','_','_','_','_','J','_','_','E','_','_','L','_','_','X'],
 ['X','X','X','X','X','X','X','X','X','X','X','X','X','X','X','X','X','X']]
```

Each character represents the name of an image. 'X ' is the location the avatar (hero) cannot pass while ' _ ' is the road it can pass. The avatar will die when meeting a monster represented by 'M'. Four of the airplanes' logos 'B.png', 'E.png', 'L.png', and

'J.png' (B: British Airways; E: EasyJet; L: Lufthansa and J: Jet2) represent the airplane that can be taken by the avatar. Draw the background of the game as shown below with the first image X.png at (10,200). H.png represents the player's avatar and its initial position is as shown in the Figure 2.

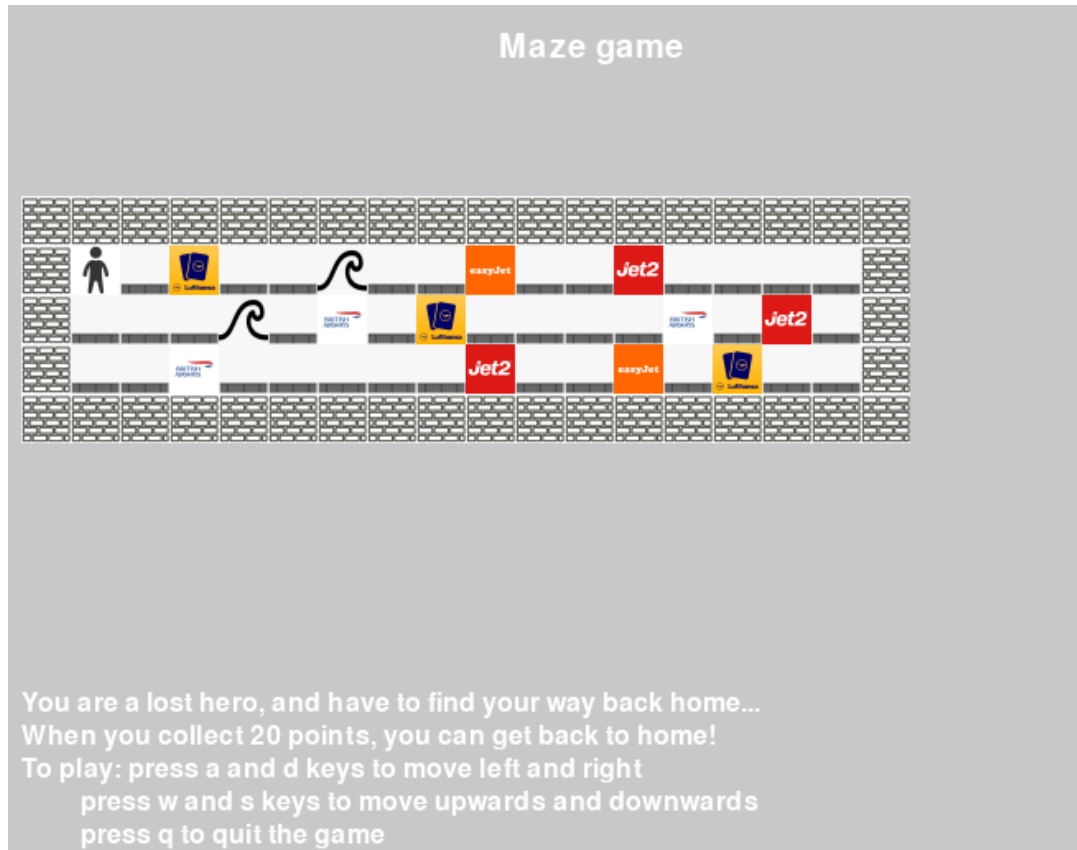


Figure 2

2. **[5 marks]**. The player can control the avatar as follow:
 - a) if the player pushes 'a', the avatar will go backward (left).
 - b) if the player pushes 'd', the avatar will go forward (right).
 - c) if the player pushes 'w', the avatar will go upward.
 - d) if the player pushes 's', the avatar will go downward.
 - e) If the player pushes 'q', quit the game and print out "Game over!!!"

3. **[5 marks]** If the avatar stands on a position which originally has an airplane company logo 'E.png' or 'J.png' or 'L.png', then the flight will be replaced by the image of the avatar. A welcome message which includes the name of **the airplane company** (as the example shown in Figure 3) should be displayed in the screen and the point should increase 1. When the avatar leaves that position, the image of the flight will be changed to the image of road(_ .png).

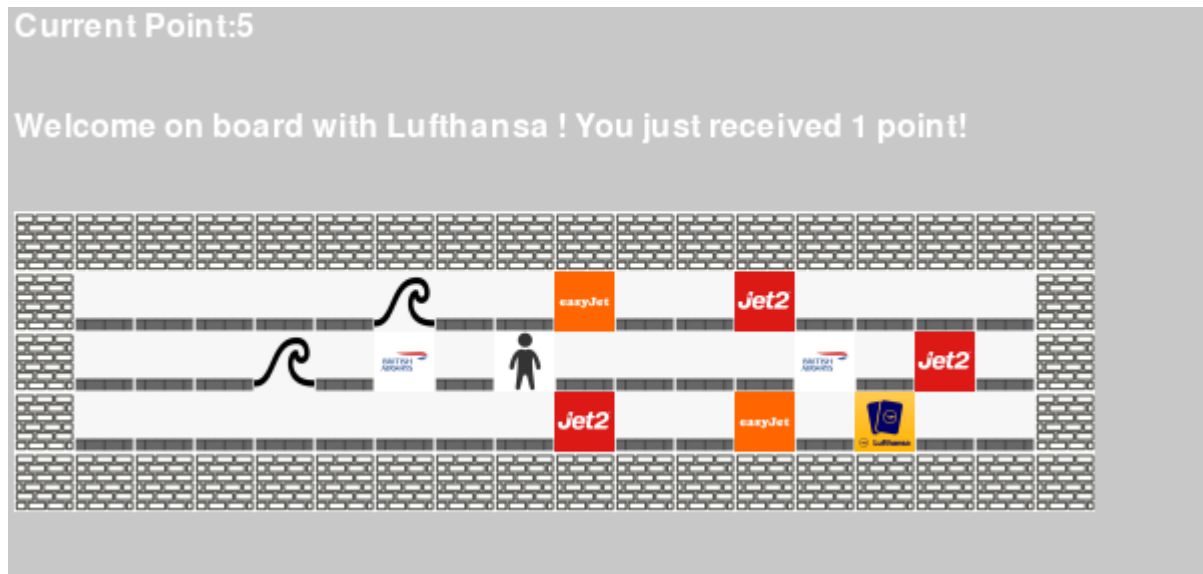


Figure 3

4. **[5 marks]** If the avatar stands on a position which originally has the image of British Airways airplane ('B.png'), the screen will display as shown in Figure 4. A welcome message **'Welcome on board with British Airways ! You just received 1 point!'** should be displayed in the screen and the point should increase 1. Moreover, the player needs to help British Airways to make a decision through pushing 'h' or 'i'.

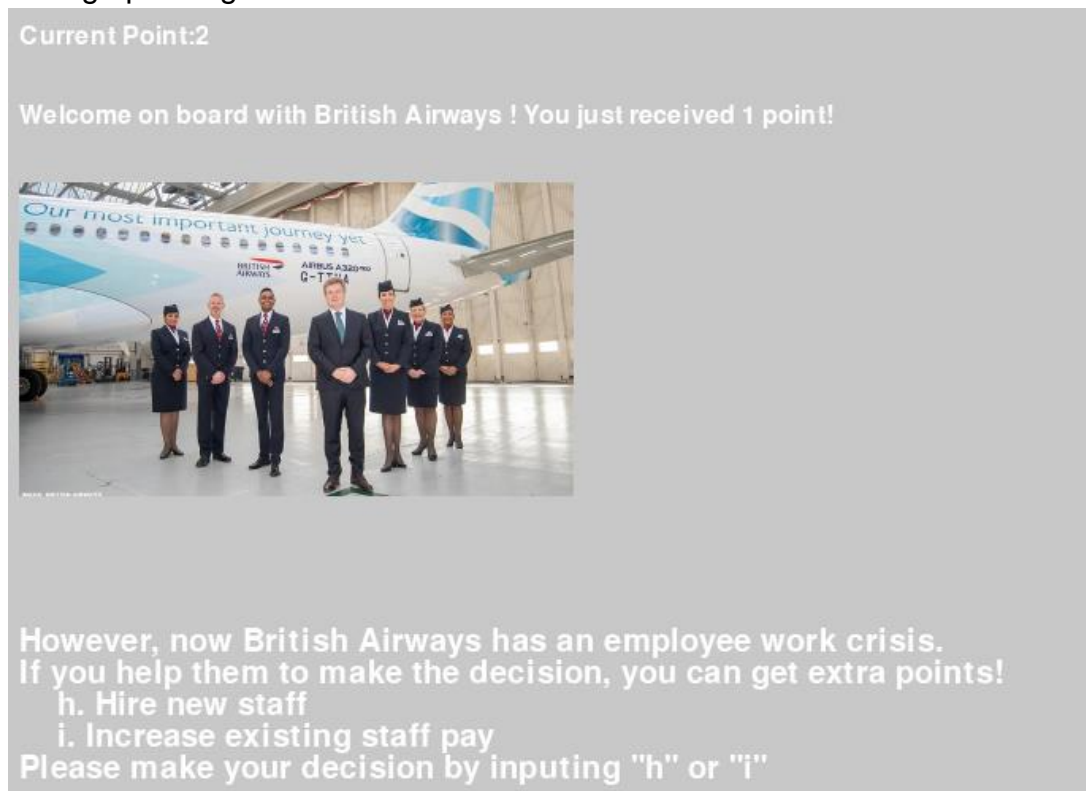


Figure 4

Design two different rewards (no more than 5 points) to the player in response to the different decisions. For example, after the player pushes 'h', the screen can display as shown in Figure 5. Similar to the previous situations, when the avatar leaves a position which originally had the image of British Airways airplane ('B.png'), the image of the flight will be changed to the image of road(_ .png).

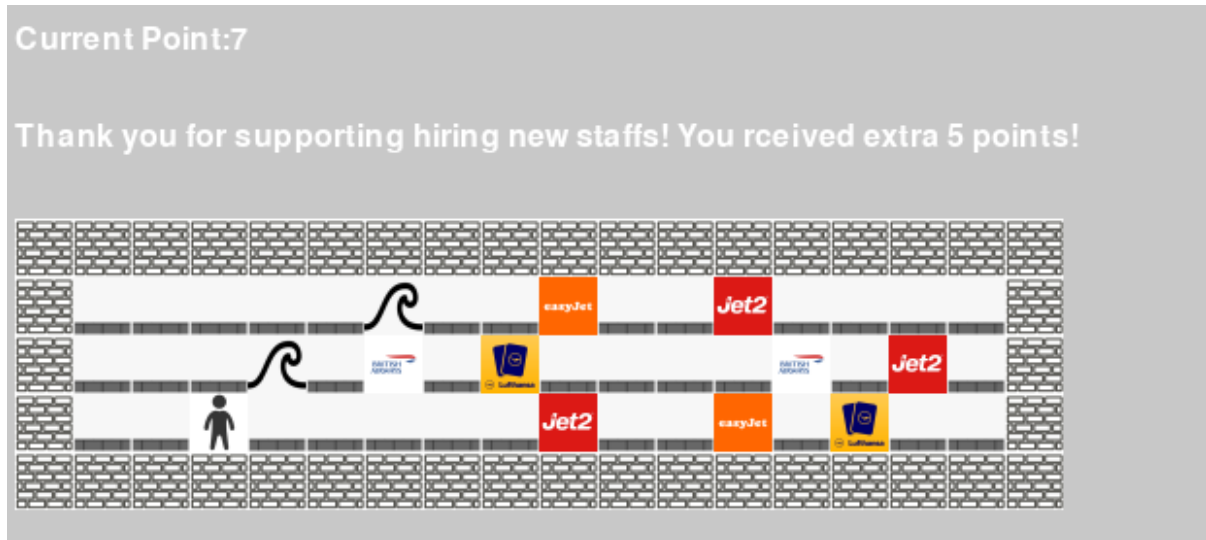


Figure 5

5. **[5 marks]** Take care of illegal input.
6. **[5 marks]** Draw the you_win.png at (100,50) and then end the game when the avatar collected equal or more than 20 points in total.

Part 2 Share price analysis [30 marks]

Background :

You have been provided with historical records of share prices for four airline companies: British Airways (IAG Historical Data.csv); EasyJet (EZJ Historical Data.csv); Jet2 (JET2 Historical Data.csv) and Lufthansa (0H4A Historical Data.csv). We want to provide a visualisation to compare the performance of these companies. In your answers to all of these questions try to produce code that is reusable i.e. it would work with different data with little modification.

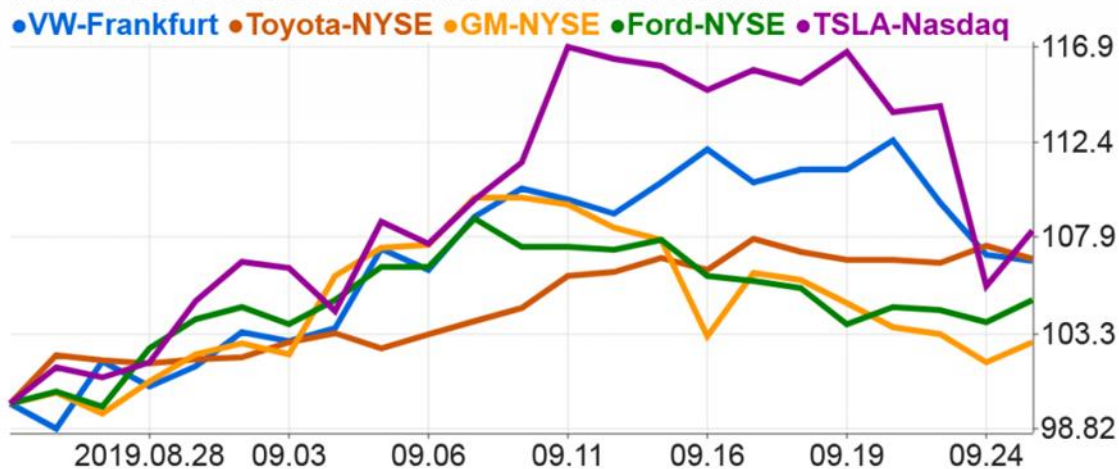
1. **[10 marks]** Import and combine all of these data into a single pandas DataFrame with columns for the company identifier, the date, and the price of the stock on that day ('Price' column in the original dataset).
2. **[5 marks]** Make a time series plot of the raw data with a separate line for each company.
3. **[5 marks]** This plot shows that some data is missing for one of the airlines. Make a selection of the dataset so that all airlines have the same data and make a time series plot of this new dataset.

4. **[10 marks]** To compare the relative performance of shares it is common practice to look at the proportional change over a period of time, by reporting the share price variation as a proportion of its value at the start of the time period. At the start of the time period all shares will have a value of 100% and go up and down from there. An example of this is shown from the web site [chartoasis](http://chartoasis.com) which compares the relative share prices of four car manufacturers. Produce a similar chart for the airline data – you do not need to use the same time period or labelling style.

Comparison chart

[change in % compared to the first date on the left]

2019.08.23-2019.09.25 Your charts at: chartoasis.com/chili



Part 3 British airways case study analysis [40 marks]

Read the British Airways case study file **Managing culture at British Airways 2021 (Final).docx** that explores a company attempting to improve organizational effectiveness, and then submit a report no more than 1500 words to answer the following questions.

1. **[10 marks]** From a managerial perspective, what are the main obstacles to improving organizational effectiveness?
2. **[5 marks]** What can we learn from the approaches taken by management to improve organizational effectiveness in the case?
3. **[10 marks]** How might we explain the employee reactions to managerial decisions in this case?
4. **[5 marks]** Referring upon the stock prices of BA (in part 2), how might you explain the fluctuation of the stock prices with the change in management?
5. **[10 marks]** What might have been a better course of action for both managers and employees?

Please draw upon between two and four the topic areas covered:

- Power and resistance

- Change management.
- Managerial Control
- Decision making
- Strategy
- Operations
- Learning in Organisations

Critically reflect on these areas to answer the questions and explore the case study.

PLAGIARISM and COLLUSION

Students suspected of plagiarism, either of published work or work from unpublished sources, including the work of other students, or of collusion will be dealt with according to Computer Science and University guidelines.

Please see <https://www.dur.ac.uk/learningandteaching.handbook/6/2/4/> and <https://www.dur.ac.uk/learningandteaching.handbook/6/2/4/1/> for further information