EE3093: C++ Student Submission Info

UNIVERSITY OF ABERDEEN **SESSION 2021-22**

EE3093: Cpp part

Degree Examination in EE3093 C/C++ PROGRAMMING

First Half Session: 2020-21

Session: **MAIN**

This document lists the student-specific Options assumed to answer each question and lists the names of the file submitted (along with this document, in PDF format) for marking. See the INSTRUCTIONS DOCUMENT for the assessment questions.

Student details

(1) Fill in the table below: Replace text within the # # symbols with your data (do not delete the # # symbols).

Student ID:	[#5 1 9 8 5 9 6 1#]
Digit	[1^{st} 2^{nd} 3^{rd} 4^{th} 5^{th} 6^{th} 7^{th} 8^{th}]

(2) Update all fields in the document header: Double click on the page **header**; Press "**CTR** + **A**"; Press **F9**.

Instructions to users

- Ensure you have followed the instructions in the "Student Details" section of this document so that **your student ID** is (automatically) **reported on each page of this document**.
- Answer the questions indicated in the INSTRUCTIONS file (PDF). In that document, specific requirements for your implementation are set depending on your student ID. You must **report in the present document** the options that you have selected (based on your student ID).
- **Source code** (header/cpp) **file** should be clearly **named and indicated** in the **present document**.

Submission info

Your **submission** via **myAberdeen** should include:

- The **StudentSelections document** (this document), reporting the selections you made based on your student ID (as instructed throughout the document) and indicating the source code files that contribute to each answer. This StudentSelections document is used to report sample test results (see page limits indicated in the INSTRUCTIONS document). Prior to submission, **convert** this word file **into a PDF file**.
- **Source code** in header/cpp **files**. Each submitted file must be mentioned in **this document.** These **files** are submitted via myAberdeen (may be zipped together for simplicity; then a single zip file is submitted).

Part 1: Basic

Report your selection for this section

Table 1: Fill in the table below to report your options for **Part 1** and the names of the files implementing and testing this part.

Your selection	ID digit leading to that selection
Basic Rules Option: ___0___	Based on 8th ID digit being: __1___
When you have completed your answers for part 1, add to the list below the names of the (.cpp, .h) files you submit for marking of your implementation and testing of Part 1	
FlightTimetableEntry.h ; main.cpp	

Sample Test Results (MAX 1 PAGE)

Report a selection of test outputs (screen printouts) demonstrating the correct behaviour of your implementation.

```
Test values:
Flight origin: Aberdeen. Flight destination: Esbjerg
Test getFlightDurationTime()
Flight duration (hh:mm) is 01:25

Test getFlightArrivalTime()
Flight departure time (hh:mm) is 09:05
Arrival (local) time (hh:mm) is 11:30

Test checkEntryVals()
Airline ID: BA. Flight code: 5100
Flight entry is valid.
```

```
Test values:
Flight origin: Aberdeen. Flight destination: Esbjerg
Flight departure time (hh:mm) is 09:05
Airline ID: BA. Flight code: 5100
First, Test checkAndSetFTE()

Done: FTE set.

Now Test getFTE() :
Airline ID: BA. Flight code: 5100
Flight origin: Aberdeen. Flight destination: Esbjerg
Flight departure time (hh:mm) is 09:05
Flight arrival (local) time (hh:mm) is 11:30
Flight duration (hh:mm) is 01:25
Done.

Next check that the same result is obtained from printEntry():
Flight from Aberdeen to Esbjerg
The provider for the flight is BA with flight code 5100
It departs at 09:05 and flies for 01:25
It will happily arrive at it's destination at local time 11:30
Done.

Finally reset:
Error - obj not initialized
```

```
Testing random entry setting
Flight from London to Manchester
The provider for the flight is BA with flight code 0304
It departs at 16:00 and flies for 01:00
It will happily arrive at it's destination at local time 17:00
```

```
Testing random entry setting
Flight from Esbjerg to Copenhagen
The provider for the flight is EZY with flight code 0667
It departs at 20:04 and flies for 00:50
It will happily arrive at it's destination at local time 20:54
```

```
Testing random entry setting
Flight from Copenhagen to Esbjerg
The provider for the flight is KL with flight code 0155
It departs at 08:59 and flies for 00:50
It will happily arrive at it's destination at local time 09:49
```

Marking (leave blank for staff):

Note: no mark awarded for implementing functionalities not required (based on your ID).

Table 2: Marks allocation for Part 1 (out of 50 marks for the entire C++ assignment)**:**

Part 1	**Marks (up to)**
Class Implementation: well structured, tidy and clearly commented.	**____/ 3**
checkAndSetFTE(…): implementation and test (via test routine)	**____/ 3**
setRandomFTE(…): implementation and test (via test routine)	**____/ 3**
reset(): implementation and test (via test routine)	**____/ 1**
getFTE(…): implementation and test (via test routine)	**____/ 2**
getFlightDurationTime(…): implementation and test (via test routine)	**____/ 2**
getFlightArrivalTime(): implementation and test (via test routine)	**____/ 2**
checkEntryVals(…): implementation and test (via test routine)	**____/ 3**
printEntry(): implementation and test (via test routine)	**____/ 2**
value2string(…): implementation and test (via test routine)	**____/ 4**
getRandomVal(…): implementation and test (via test routine)	**____/ 1**
Reporting of Test results (as instructed in the Student Selection Document)	**____/ 2**
Tot Part 1 = ____/ 28 Marks	

Part 2: Intermediate

Report your selection for this section

Table 3: Fill in the table below to report your options for **Part 2** and the names of the files implementing and testing this part.

Your selection	ID digit leading to that selection
Airport Option: ___3__	Based on 7th ID digit being: _6___
Airport Rules Option: __4___	Based on 6th ID digit being: __9__
When you have completed your answers for part 2, add to the list below the names of the (.cpp, .h) files you submit for marking of your implementation and testing of Part 2 (do not list files already submitted for part 1)	
AirportFlightTimetable.h ; _____ ; _____ ; _____ ; _____ ; _____	

Sample Test Results (MAX 2 PAGES)

Report a selection of test outputs (screen printouts) demonstrating the correct behaviour of your implementation.

```
Entry is valid: Inserting Entry
Entry Added
This is the timetable.
========Arrivals to Copenhagen========:
Pos 0:   Aberdeen       08:37   BA5104
Pos 1:   Manchester     08:56   EZY5169
Pos 2:   Esbjerg        09:20   KL0151
Pos 3:   Manchester     09:54   KL5145
Pos 4:   Esbjerg        10:12   EZY0167
Pos 5:   London         10:14   SK5135
Pos 6:   Esbjerg        10:56   LM0199
Pos 7:   London         11:55   LM5193
Pos 8:   Aberdeen       12:05   SK5337
Pos 9:   London         13:01   LM5393
Pos 10:  Aberdeen       13:02   SK5338
Pos 11:  Esbjerg        14:03   EZY0367
Pos 12:  Aberdeen       15:44   SK5334
Pos 13:  London         16:53   SK5339
Pos 14:  Aberdeen       16:59   SK5324
Pos 15:  Aberdeen       17:34   SK5335
Pos 16:  Aberdeen       17:56   LM5395
Pos 17:  Esbjerg        18:00   KL0356
Pos 18:  Esbjerg        19:40   BA0608
Pos 19:  Esbjerg        19:55   BA0615
Pos 20:  Aberdeen       20:26   SK5329
Pos 21:  London         21:12   EZY5662
Pos 22:  Esbjerg        21:12   KL0657
Pos 23:  Aberdeen       22:41   BA5613
======================================
======Departures from Copenhagen======:
Pos 0:   Esbjerg        06:40   LM0193
Pos 1:   Manchester     06:45   EZY5177
Pos 2:   Aberdeen       07:20   LM5195
Pos 3:   Manchester     07:57   KL5154
Pos 4:   Manchester     08:56   EZY5163
Pos 5:   Aberdeen       08:58   EZY5167
Pos 6:   Esbjerg        09:20   EZY0168
Pos 7:   Esbjerg        12:30   BA0319
Pos 8:   Aberdeen       12:37   BA5306
Pos 9:   Aberdeen       13:44   BA5311
Pos 10:  Manchester     14:15   SK5330
Pos 11:  Aberdeen       14:54   KL5344
Pos 12:  Manchester     15:20   EZY5369
Pos 13:  Aberdeen       15:43   EZY5361
Pos 14:  Esbjerg        15:53   KL0348
Pos 15:  Esbjerg        16:23   BA0309
Pos 16:  Aberdeen       16:30   LM5383
Pos 17:  London         16:31   SK5331
Pos 18:  Esbjerg        17:00   BA0302
Pos 19:  London         17:05   KL5349
Pos 20:  Manchester     17:26   SK5337
Pos 21:  Aberdeen       18:51   SK5638
Pos 22:  London         18:53   EZY5679
Pos 23:  Aberdeen       20:33   LM5698
======================================
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```

```
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Random entry 48:
Checking entry:
Flight from Copenhagen to Manchester
The provider for the flight is EZY with flight code 5171
It departs at 08:54 and flies for 01:40
It will happily arrive at it's destination at local time 09:34
Error - maximum departing international flights per hour reached at hour 8
Check Failed: Entry can't be added to current timetable; try a different one

Checking entry:
Flight from Copenhagen to London
The provider for the flight is EZY with flight code 5366
It departs at 16:53 and flies for 01:45
It will happily arrive at it's destination at local time 17:38
Error - maximum departing international flights per hour reached at hour 16
Check Failed: Entry can't be added to current timetable; try a different one

Checking entry:
Flight from London to Copenhagen
The provider for the flight is BA with flight code 5611
It departs at 18:22 and flies for 01:45
It will happily arrive at it's destination at local time 21:07
Error. There needs to be a 12 minute flight separation between arrivals.
Check Failed: Entry can't be added to current timetable; try a different one

Checking entry:
Flight from Aberdeen to Copenhagen
The provider for the flight is KL with flight code 5355
It departs at 10:41 and flies for 01:35
It will happily arrive at it's destination at local time 13:16
Error - maximum arriving international flights per hour reached at hour 13
Check Failed: Entry can't be added to current timetable; try a different one

Checking entry:
Flight from Copenhagen to Manchester
The provider for the flight is SK with flight code 5325
It departs at 11:42 and flies for 01:40
It will happily arrive at it's destination at local time 12:22
All checks passed.
```

```
This is the timetable.
========Arrivals to Copenhagen========:
Pos 0:   Esbjerg        07:13   KL0152
Pos 1:   Esbjerg        08:08   EZY0166
Pos 2:   Manchester     08:48   KL5159
Pos 3:   Esbjerg        08:49   LM0186
Pos 4:   Aberdeen       09:14   LM5199
Pos 5:   Aberdeen       09:38   EZY5174
Pos 6:   Esbjerg        10:26   BA0109
Pos 7:   Aberdeen       10:34   EZY5163
Pos 8:   Esbjerg        11:23   BA0119
Pos 9:   Esbjerg        11:39   EZY0161
Pos 10:  Esbjerg        11:53   KL0146
Pos 11:  Manchester     12:03   LM5383
Pos 12:  Esbjerg        12:06   KL0359
Pos 13:  Esbjerg        12:28   EZY0378
Pos 14:  Esbjerg        13:03   LM0395
Pos 15:  Esbjerg        13:34   SK0321
Pos 16:  Manchester     14:42   SK5329
Pos 17:  Aberdeen       16:00   SK5336
Pos 18:  London         16:35   KL5353
Pos 19:  London         17:24   BA5313
Pos 20:  Esbjerg        17:34   SK0338
Pos 21:  Manchester     17:35   LM5382
Pos 22:  Esbjerg        19:08   KL0650
Pos 23:  Esbjerg        19:25   SK0634
Pos 24:  Manchester     19:57   KL5348
Pos 25:  Manchester     20:14   EZY5379
Pos 26:  Esbjerg        20:26   EZY0665
Pos 27:  Esbjerg        21:04   BA0600
Pos 28:  Manchester     21:05   SK5623
Pos 29:  Aberdeen       21:34   BA5601
Pos 30:  Manchester     22:16   SK5629
Pos 31:  Manchester     22:48   KL5645
Pos 32:  Aberdeen       23:14   SK5622
Pos 33:  Manchester     23:14   LM5699
=====================================
======Departures from Copenhagen======:
Pos 0:   Aberdeen       06:15   BA5106
Pos 1:   Esbjerg        06:19   SK0139
Pos 2:   Aberdeen       06:22   EZY5175
Pos 3:   Esbjerg        07:12   BA0103
Pos 4:   Esbjerg        07:21   LM0184
Pos 5:   Esbjerg        07:30   EZY0173
Pos 6:   Manchester     07:51   KL5140
Pos 7:   Aberdeen       08:04   LM5192
Pos 8:   Manchester     08:43   LM5185
Pos 9:   Aberdeen       09:05   SK5135
Pos 10:  Manchester     09:15   LM5187
Pos 11:  London         10:32   KL5143
Pos 12:  Aberdeen       11:27   KL5352
Pos 13:  London         11:37   EZY5374
Pos 14:  Esbjerg        11:45   EZY0369
Pos 15:  Manchester     12:59   BA5315
Pos 16:  Aberdeen       13:11   KL5357
Pos 17:  London         13:30   BA5306
Pos 18:  London         14:40   EZY5367
Pos 19:  Aberdeen       14:41   BA5318
Pos 20:  Esbjerg        14:53   LM0390
Pos 21:  Esbjerg        15:10   LM0387
Pos 22:  Esbjerg        15:18   SK0321
Pos 23:  London         15:21   KL5340
Pos 24:  Aberdeen       15:59   LM5386
Pos 25:  Esbjerg        16:12   KL0349
Pos 26:  London         16:46   BA5309
Pos 27:  Manchester     16:54   KL5341
Pos 28:  Aberdeen       17:00   KL5346
Pos 29:  Esbjerg        17:12   SK0323
Pos 30:  London         17:57   BA5310
Pos 31:  Manchester     18:00   KL5656
Pos 32:  Esbjerg        18:22   SK0635
Pos 33:  Manchester     19:36   KL5658
Pos 34:  Esbjerg        20:10   LM0680
Pos 35:  Manchester     20:23   SK5626
Pos 36:  Manchester     20:35   SK5631
Pos 37:  Esbjerg        20:44   EZY0673
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```

Tables properly fill up when reaching capacity.

I'd show off the "flights per hour" check as well, but because we're in Denmark it's unlikely we'll have two international flights + two national flights per hour and we try to add another national one (because there's only one city).

```
This is the timetable.
========Arrivals to Copenhagen========:
Pos 0:   Aberdeen       08:37   BA5104
Pos 1:   Esbjerg        09:20   KL0151
Pos 2:   Manchester     09:54   KL5145
Pos 3:   London         10:14   SK5135
Pos 4:   Esbjerg        10:56   LM0199
Pos 5:   Aberdeen       12:05   SK5337
Pos 6:   London         13:01   LM5393
Pos 7:   Aberdeen       13:02   SK5338
Pos 8:   Esbjerg        14:03   EZY0367
Pos 9:   Aberdeen       15:44   SK5334
Pos 10:  London         16:53   SK5339
Pos 11:  Aberdeen       16:59   SK5324
Pos 12:  Aberdeen       17:34   SK5335
Pos 13:  Esbjerg        18:00   KL0356
Pos 14:  Esbjerg        19:40   BA0608
Pos 15:  Esbjerg        19:55   BA0615
Pos 16:  Aberdeen       20:26   SK5329
Pos 17:  London         21:12   EZY5662
Pos 18:  Esbjerg        21:12   KL0657
Pos 19:  Aberdeen       22:41   BA5613
=====================================
======Departures from Copenhagen======:
Pos 0:   Manchester     06:45   EZY5177
Pos 1:   Aberdeen       07:20   LM5195
Pos 2:   Manchester     07:57   KL5154
Pos 3:   Manchester     08:56   EZY5163
Pos 4:   Aberdeen       08:58   EZY5167
Pos 5:   Esbjerg        09:20   EZY0168
Pos 6:   Aberdeen       12:37   BA5306
Pos 7:   Manchester     14:15   SK5330
Pos 8:   Manchester     15:20   EZY5369
Pos 9:   Aberdeen       15:43   EZY5361
Pos 10:  Esbjerg        15:53   KL0348
Pos 11:  Esbjerg        16:23   BA0309
Pos 12:  Aberdeen       16:30   LM5383
Pos 13:  London         16:31   SK5331
Pos 14:  Esbjerg        17:00   BA0302
Pos 15:  Manchester     17:26   SK5337
Pos 16:  Aberdeen       18:51   SK5638
Pos 17:  London         18:53   EZY5679
Pos 18:  Aberdeen       20:33   LM5698
=====================================
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Random entry 39:
Checking entry:
Flight from Manchester to Copenhagen
The provider for the flight is SK with flight code 5324
It departs at 15:46 and flies for 01:40
It will happily arrive at it's destination at local time 18:26
Error. Flight with this flight code already exists
Check Failed: Entry can't be added to current timetable; try a different one
```

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Random entry 71:
Checking entry:
Flight from Aberdeen to Copenhagen
The provider for the flight is BA with flight code 5607
It departs at 19:44 and flies for 01:35
It will happily arrive at it's destination at local time 22:19
Arrival timetable is full
Check Failed: Entry can't be added to current timetable; try a different one

Checking entry:
Flight from Copenhagen to Manchester
The provider for the flight is LM with flight code 5184
It departs at 07:36 and flies for 01:40
It will happily arrive at it's destination at local time 08:16
Arrival timetable is full
All checks passed.

Entry is valid: Inserting Entry
Entry Added
```

Programme informs that the arrival table is full regardless of whether we're adding into departures or not.

Marking (leave blank for staff):

Note: no mark awarded for implementing functionalities not required (based on your ID).

Table 4: Marks allocation for Part2 (out of 50 marks for the entire C++ assignment)**:**

Part 2	**Marks (up to)**
Class Implementation: well structured, tidy and clearly commented.	**____/ 3**
checkEntryIsValid (…): implementation and test (via test routine)	**____/ 8** 3 if Common Airport rule correct 5 if Specific Airport rule correct
checkAndAddEntry (…): implementation and test (via test routine)	**____/ 4**
printTimetable (…): implementation and test (via test routine)	**____/ 3**
isTimetableFull (…): implementation and test (via test routine)	**____/ 2**
Reporting of Test results (as instructed in the Student Selection Document)	**____/ 3**
	Tot Part 2 = ____/ 22 Marks

Total Score (leave blank for staff)

Marking: leave blank for staff

Task:	**Marks (up to)**
Part 1	_____ / **28**
Part 2	_____ / **22**
TOT	_____ / **50**