INFORMATICS INSTITUTE OF TECHNOLOGY

Foundation Certificate in Higher Education

Module – DOC 333 Introduction to Programming

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Abstract

The Flight Route program is a python-based tool which offers users the ability to choose from a predetermined list of starting and ending locations, allowing them to conveniently structure their route easily. Through its features like showing aircraft routes with durations and the least time airplane journey and navigating from one option to the other easily, it is providing all these facilities. The program includes the act of countries approval, menu navigation, and interact user prompts, taking the whole tool for the investigation of the flight routes and hours between the countries.

Acknowledgement

Firstly, I would like to express our sincere gratitude and give my warmest thanks to the course leader Mr. Sudharshan Welihinda who made this work possible. His invaluable guidance, mentorship, advice and insightful feedback throughout the course work process carried me through all the stages of writing my university report into success.

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Thank you!

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1.Introduction

The flight program written in Python enables users to travel around the world and make stopovers at different countries and discover the durations of their flights between these destinations. Users can choose between a list of default starting and destination countries and find all possible round trip with duration, moreover, they can select the route with the least traveling time between two countries. The program gives users the capability to choose from a variety of options to make their travel plans as easy as possible and, therefore, increases their satisfaction from the program.

2. Algorithms

01. Start
02. Store the countries to the tuple for the validating the when users input the Country code to check whether is it in the country list
03. Make a function called 'countryValidation' and pass the parameter as the country that checks and validates the country that the user chooses is it in the previous mentioned country list tuple.
04. A function named ‘countryMenu()’to list country options and process input rightly has to be created.
05. Write a ‘mainMenu’ and pass the 2 parameters to return the validated 2 countries to the function that will display the menu items and respectively handle the selections done by the user.
06. After comes to the Route Detail function and get 2 arguments as first country and second country and check the all countries and mapping roues by using users inputs
07. The function 'least_country' shall be defined as 'least_country(first_country, second_country)'. In which, the time-path between these two nations will be estimated.
08. Design the 'maps' data construct that consists of the information as time limit and routes between countries.
09. After the outline is worked out, we come to the 'countryMenu ()’function execution.
10. End.

3. Python Program

```
import sys

countryList = ["SL","UK", "US", "Japan", "Singapore", "Australia"]

# country Validation def
countryValidation(country):
    return country > 0 and country <= len(countryList)

def countryMenu():
    print("\n----------\n")     print("*    -->
Flight Route Company        <---     *\n")     print("*--------- Select your
destination Countries  ---------*\n")     print("\n 1.SL \n 2.UK\n 3.US\n 4.Japan
\n 5.Singapore \n 6.Australia  \n")     print("\n----------
----------\n")

    while True:
        temp_first_country = int(input("Enter the Starting country index from the list: "))
if countryValidation(temp_first_country):
            first_country = countryList[temp_first_country - 1]
print("You Selected Your starting country as "+first_country)
print("\n----------\n")            break
else:
            print("Invalid country. Please select from the provided list.")

    while True:
        temp_second_country = int(input("Enter the Destination country index from the list: "))
if countryValidation(temp_second_country):            if countryList[temp_second_country - 1] !=
first_country:

                second_country = countryList[temp_second_country - 1]
print("You Selected Your destination country as "+second_country)
```

```
print("\n----------\n")              break
else:
        print("Destination country cannot be the same as the starting country.")
else:
    print("Invalid country. Please select from the provided list.")

  print("Hello Customer! You have selected to travel from", first_country, "to", second_country)
print("\n----------\n")    print("\n Waiting for Loading Country
Data...")    print("\n----------\n")

  # calling main menu
mainMenu(first_country, second_country)

def mainMenu(first_country, second_country):    while
True:
    print("----------")       print("    ---------->
Flight Route Company        <---------- ")       print("----------
----------\n")       print("01. Display All possible airline routes between two given countries with
durations.")       print("02. Display least time airline route between two given countries.")
print("03. Exit")       print("\n----------\n")

    choice = int(input("Enter your Choice Number: "))
if choice == 1:          routeDetails(first_country,
second_country)       elif choice == 2:
        least_country(first_country, second_country)
elif choice == 3:
        print("Thank you for using our service!")
sys.exit()       else:
        print("Invalid Choice..")

def routeDetails(first_country, second_country):
```

```
print("\n_____
_____
_____\n")
   print("*          ------>       Flight Route Company       <-------       *\n")

print("_____
_____
_____\n")    print(f"Starting Country: {first_country}                  Destination Country:
{second_country}\n")

print("_____
_____ _____\n")


   found_data = False


   for routes in maps:
      if routes["Route"]["First Country"] == first_country and routes["Route"]["Second Country"] ==
second_country:
         duration = routes["duration"]          middle_country =
routes["Route"]["Middle Country"]
         print(f"Route: {first_country} -> {middle_country} -> {second_country}
Expected Duration: {duration}\n")
found_data = True


   if not found_data:
      print(" There are no routes between " + first_country + " to "+ second_country)
print("\n back to main menu to click ( M )")
print("\n_____
_____\n")


   choice = str(input("Do you want to Move Main Menu / Country Menu or Go Exit.? M / C / E
:")).upper()    if
choice == "M":
```

```
        print("\n_________________ You Selected to go to the Main menu _____________________\n")
print("\n_____________________________________________________________________________\
n")        mainMenu(first_country, second_country)     elif choice == "C":
        print("\n_________________ You Selected to go to the Country menu _____________________\n")
print("\n_____________________________________________________________________________\
n")        countryMenu()     elif choice == "E":
        print("Thank you for using our service!")
sys.exit()     else:         print("Invalid Choice..")



def least_country(first_country, second_country):
    print("\n-------------------------------------------------------------------------\n")     print("*
------>         Flight Route Company         <-------         *\n")

print("_____________________________________________________________________________
_______
_________________\n")     print(f"Starting Country: {first_country}                    Destination Country:
{second_country}\n")


    temp_duration = float('inf')
least_route = ""

    for routes in maps:
        if routes["Route"]["First Country"] == first_country and routes["Route"]["Second Country"] ==
second_country:
            duration = float(routes["duration"].split()[0])
if duration < temp_duration:                temp_duration =
duration                least_route = routes["Route"]["Middle
Country"]



print("_____________________________________________________________________________
_______
```

```
_____\n"
)    if temp_duration == float('inf'):
      print("There are no routes between " + first_country + " to "+ second_country)    else:
      print(f"Route: {first_country} -> {least_route} -> {second_country}                    Expected
Duration: {temp_duration} Hrs\n")


print("_____
_____ _____\n")


  while True:
try:
        choice = str(input("Do you want to Move Main Menu / Country Menu or Go Exit.? M / C / E
:")).upper()          if choice in (
"M", "C", "E"):
            break
else:
            print("Invalid Choice, Please Enter M / C or E ..")
except ValueError:
        print("Invalid Choice, Please Enter M / C or E ..")


  if choice == "M":
      print("\n_____ You Selected to go to the Main menu _____\n")
print("\n_____\
n")       mainMenu(first_country, second_country)    elif choice == "C":
      print("\n_____ You Selected to go to the Country menu _____\n")
print("\n_____\
n")       countryMenu()    elif choice == "E":
      print("Thank you for using our service!")
sys.exit()    else:
      print("Invalid Choice..")
```

```
maps = [
  {
    "Route" : {
      "First Country" : "SL",
      "Middle Country" : "",
      "Second Country" : "UK"
    },
    "duration" : "11.45 Hrs"
  },
  {
    "Route" : {
      "First Country" : "SL",
      "Middle Country" : "UK",
      "Second Country" : "US"
    },
    "duration" : "19.45 Hrs"
  },
  {
    "Route" : {
      "First Country" : "SL",
      "Middle Country" : "JAPAN",
      "Second Country" : "US"
    },
    "duration" : "24 Hrs"
  },
  {
    "Route" : {
      "First Country" : "SL",
      "Middle Country" : "Singapore -> Japan",
      "Second Country" : "US"
    },
```

```
      "duration" : "24 Hrs"
   },
   {
      "Route" : {
         "First Country" : "SL",
"Middle Country" : "",
         "Second Country" : "Japan"
      },
      "duration" : "8 Hrs"
   },
   {
      "Route" : {
         "First Country" : "SL",
         "Middle Country" : "Singapore",
         "Second Country" : "Japan"
      },
      "duration" : "8 Hrs"
   },
   {
      "Route" : {
         "First Country" : "SL",
"Middle Country" : "",
         "Second Country" : "Singapore"
      },
      "duration" : "4 Hrs"
   },
   {
      "Route" : {
         "First Country" : "SL",
"Middle Country" : "",
         "Second Country" : "Australia"
```

```
    },
    "duration" : "9.25 Hrs"
  },
  {
    "Route" : {
      "First Country" : "SL",
      "Middle Country" : "Singapore",
      "Second Country" : "Australia"
    },
    "duration" : "11.25 Hrs"
  },
  {
    "Route" : {
      "First Country" : "SL",
      "Middle Country" : "Singapore -> Japan",
      "Second Country" : "Australia"
    },
    "duration" : "18 Hrs"
  },
  {
    "Route" : {
      "First Country" : "SL",
      "Middle Country" : "Japan",
      "Second Country" : "Australia"
    },
    "duration" : "18 Hrs"
  },
  {
    "Route" : {
      "First Country" : "UK",
      "Middle Country" : "",
```

```
        "Second Country" : "US"
      },
      "duration" : "8 Hrs"
    },
    {
      "Route" : {
        "First Country" : "Japan",
"Middle Country" : "",
        "Second Country" : "US"
      },
      "duration" : "16 Hrs"
    },
    {
      "Route" : {
        "First Country" : "Japan",
        "Middle Country" : "",
        "Second Country" : "Australia"
      },
      "duration" : "10 Hrs"
    },
    {
      "Route" : {
        "First Country" : "Singapore",
        "Middle Country" : "",
        "Second Country" : "Japan"
      },
      "duration" : "4 Hrs"
    },
    {
      "Route" : {
        "First Country" : "Singapore",
```

```
        "Middle Country" : "Japan",
        "Second Country" : "US"
      },
      "duration" : "20 Hrs"
   },
   {
      "Route" : {
        "First Country" : "Singapore",
        "Middle Country" : "",
        "Second Country" : "Australia"
      },
      "duration" : "7.25 Hrs"
   },
   {
      "Route" : {
        "First Country" : "Singapore",
        "Middle Country" : "Japan",
        "Second Country" : "Australia"       },
      "duration" : "14 Hrs"
   },
]

# calling to the Program countryMenu()
```

4. Test Cases

4.1. Test case 1 :

Input Entered	Expected Output	Actual Output	Result
1, 2, 01	1. Display all routes from SL to UK	1.Display all routes from SL to UK	Pass

Table 1-Test case 1

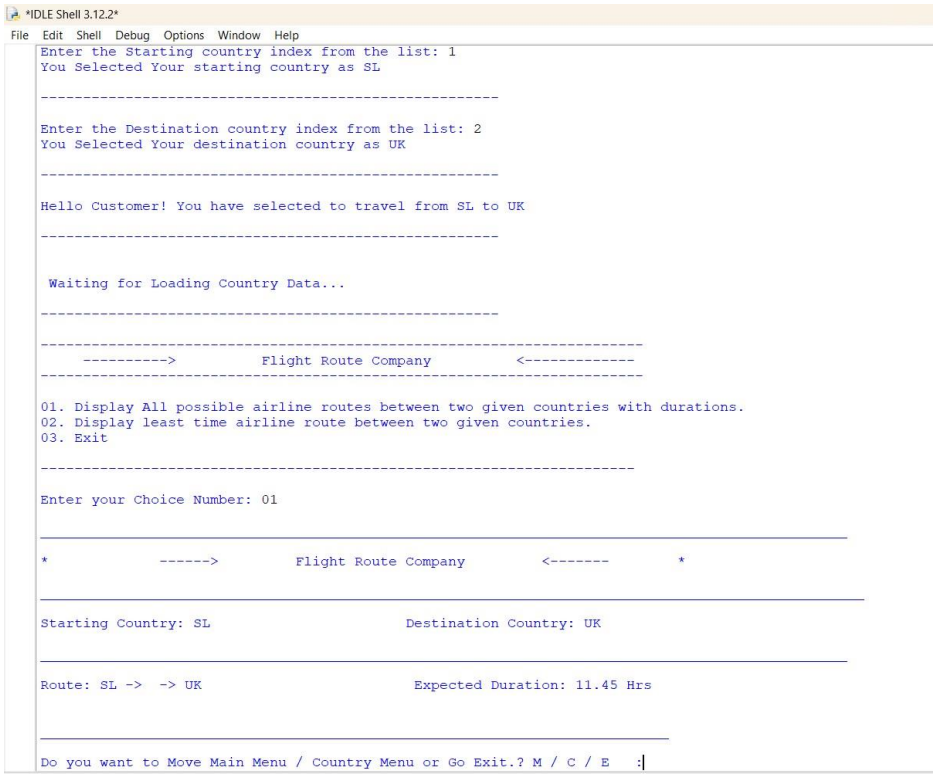


Figure 1.Test case-1

4.2. Test case 2 :

Input Entered	Expected Output	Actual Output	Result
1,3,01	1. Display all routes from SL to USA	1. Display all routes from SL to USA	Pass

Table 2- Test case 2

Figure 2. Test case-2

4.3. Test case 3 :

Input Entered	Expected Output	Actual Output	Result
1,4,01	1. Display all routes from SL to Japan	1. Display all routes from SL to Japan	Pass

Table 3- Test case 3

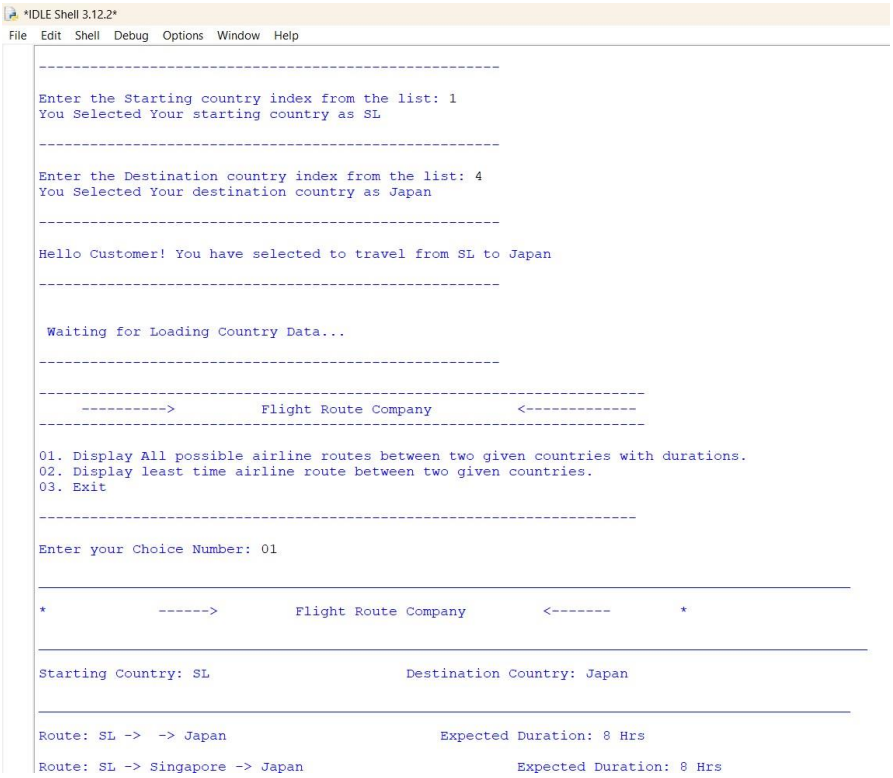


Figure 3. Test case-3

4.4. Test case 4 :

Input Entered	Expected Output	Actual Output	Result
5,6,01	1. Display all routes from Singapore to Australia	1. Display all routes from Singapore to Australia	Pass

Table 4- Test case 4

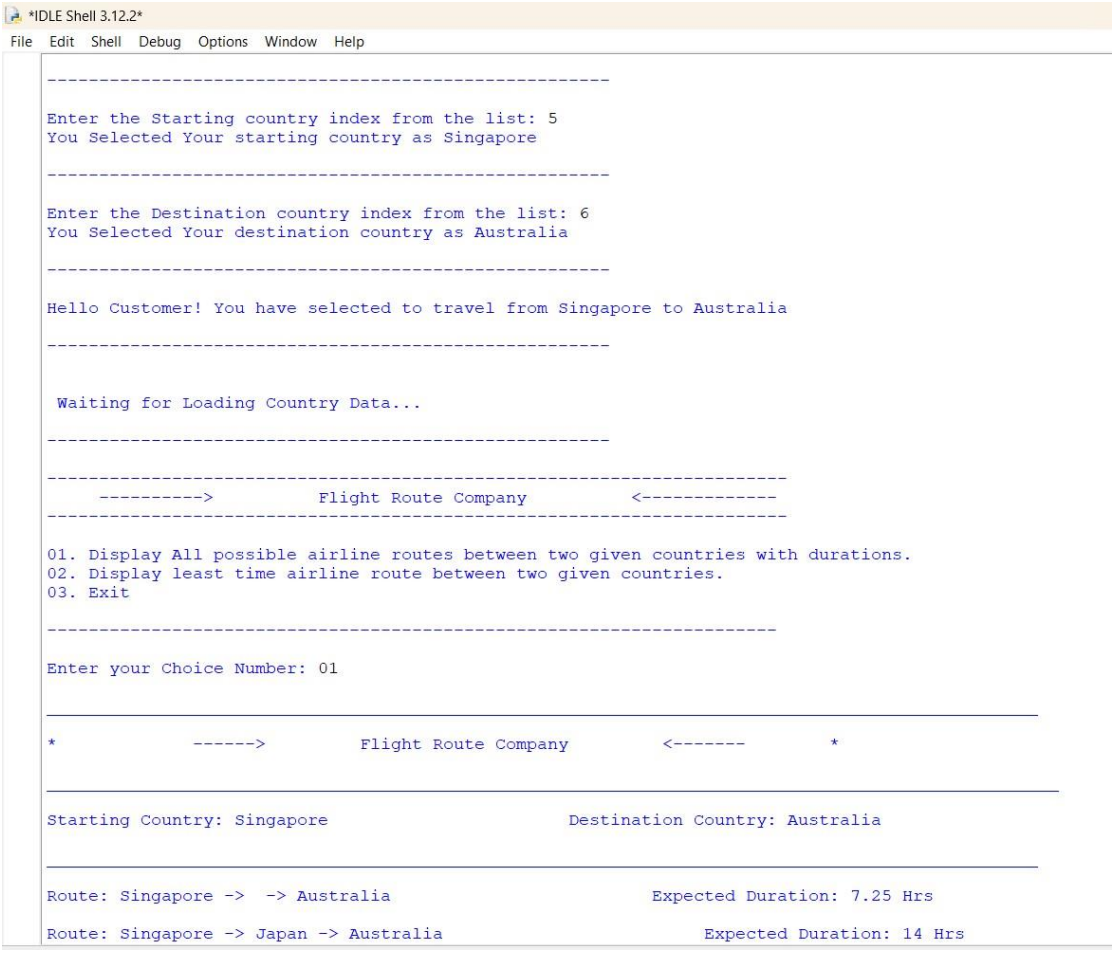


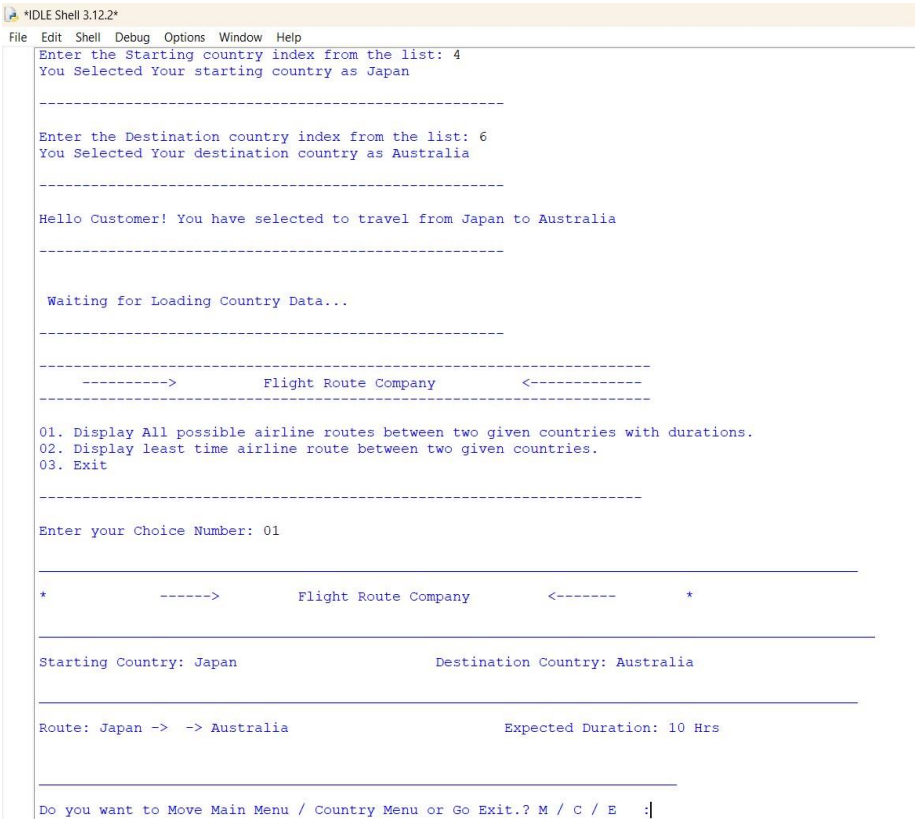
Figure 4. Test case-4

Expected Output	Actual Output	Result

4.5. Test case 5 :

Input Entered			
4,6,01	1. Display all routes from Japan to Australia	1. Display all routes from Japan to Australia	Pass

Table 5- Test case 5



Figure

5. Test case-5

4.6. Test case 6 :

Input Entered	Expected Output	Actual Output	Result
1,3,02	1. Display least airline routes from SL to USA	1. Display least airline routes from SL to USA	Pass

Table 6- Test case 6

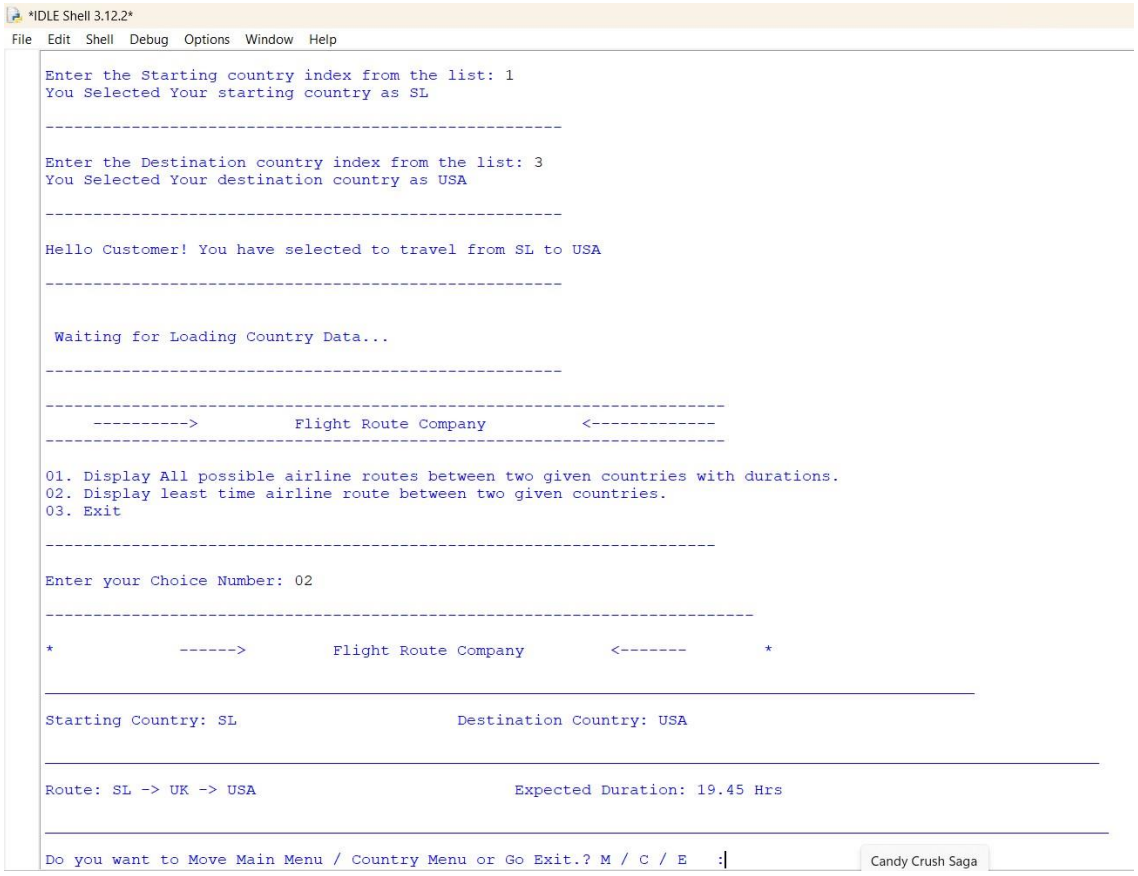


Figure 6. Test case-6

1. Display least airline	1. Display least airline	Pass

Expected Output	Actual Output	Result

4.7. Test case 7

:

Input Entered		
5,6,02	routes from Singapore to Australia	routes from Singapore to Australia

Table 7- Test case 7

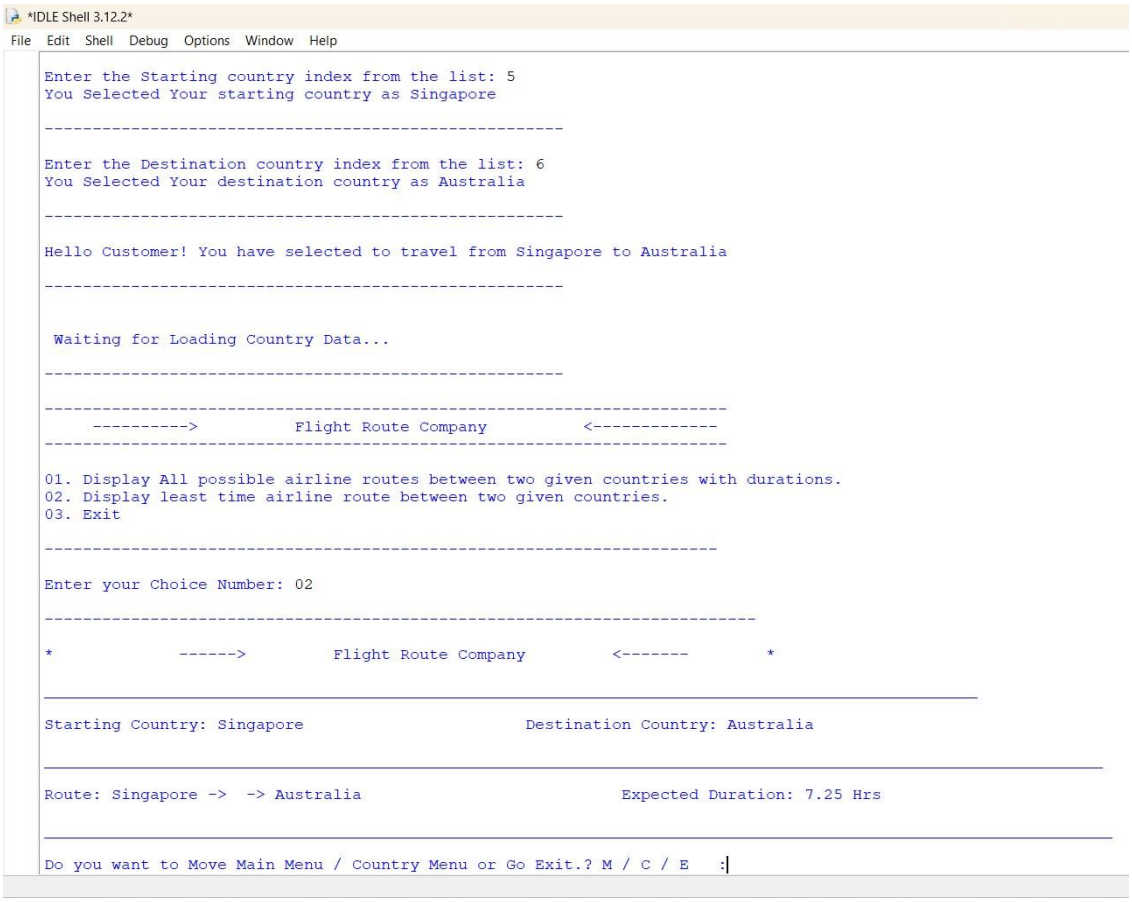


Figure 7.Test case-7

1. Display least airline	1. Display least airline	Pass

Expected Output	Actual Output	Result

4.8. Test case 8

:

Input Entered		
1,6,02	routes from SL to Australia	routes from SL to Australia

Table 8- Test case 8

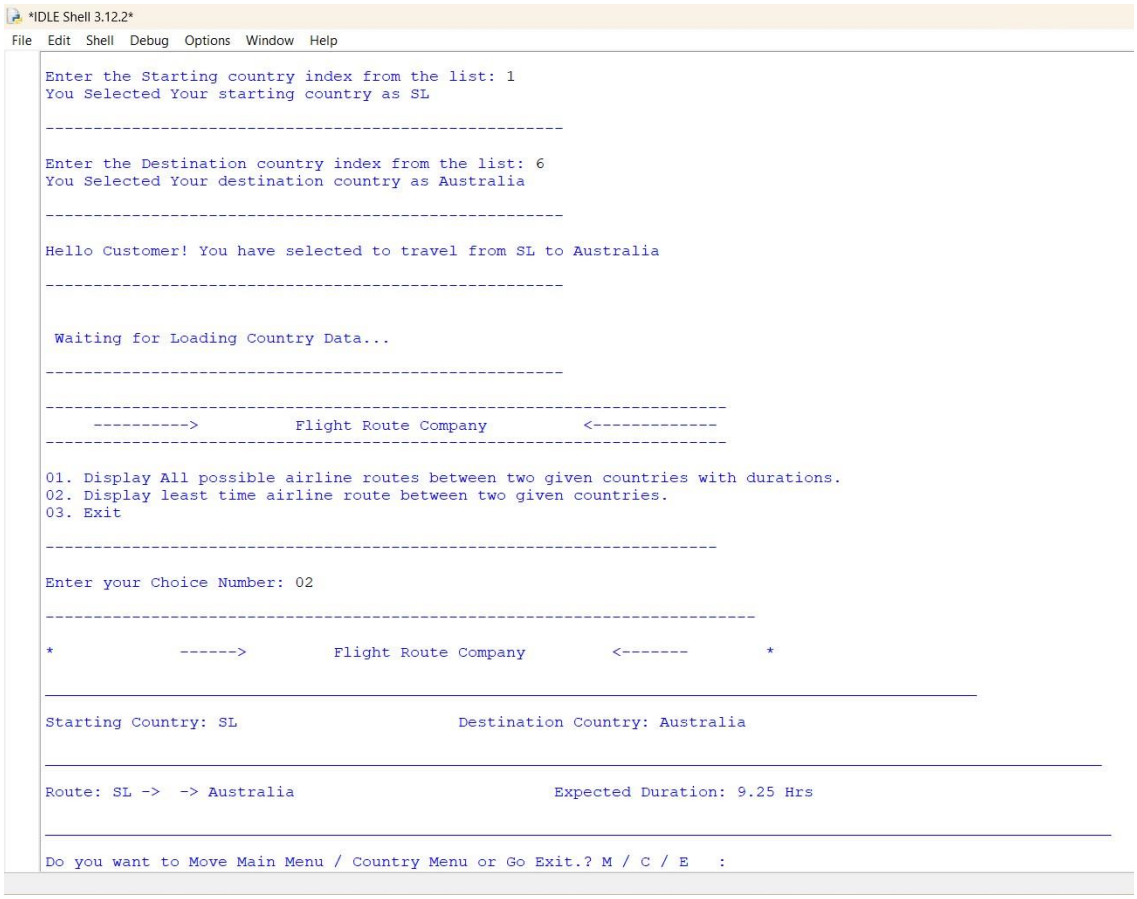


Figure 8. Test case-8

1. Display least airline	1. Display least airline	Pass	

Expected Output	Actual Output	Result

4.9. Test case 9

:

Input Entered		
1,4,02	routes from SL to Japan	routes from SL to Japan

Table 9- Test case 9

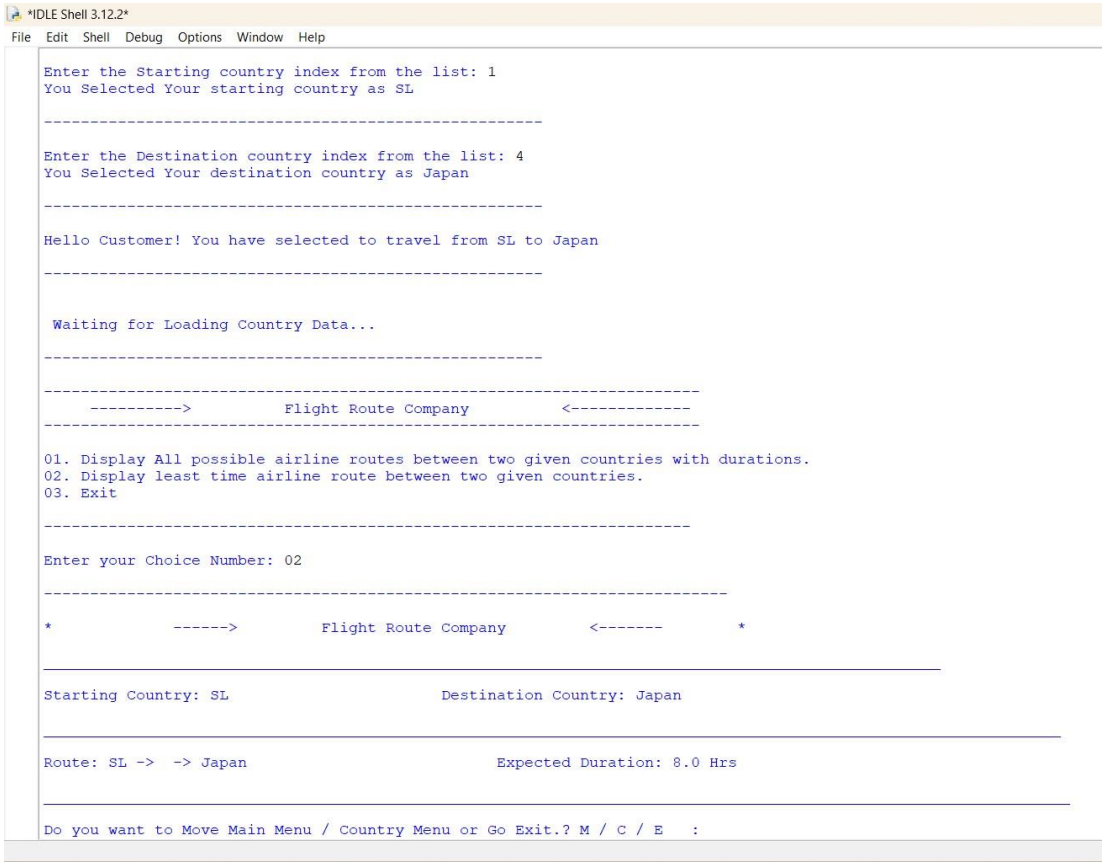


Figure 9. Test case-9

1. Display least airline	1. Display least airline	Pass

Expected Output	Actual Output	Result

1. Display least airline	1. Display least airline	Pass	

4.10.Test case 10 :

Input Entered	Expected Output	Actual Output	Result
4,3,02	routes from Japan to USA	routes from Japan to USA	

Table 10- Test case 10

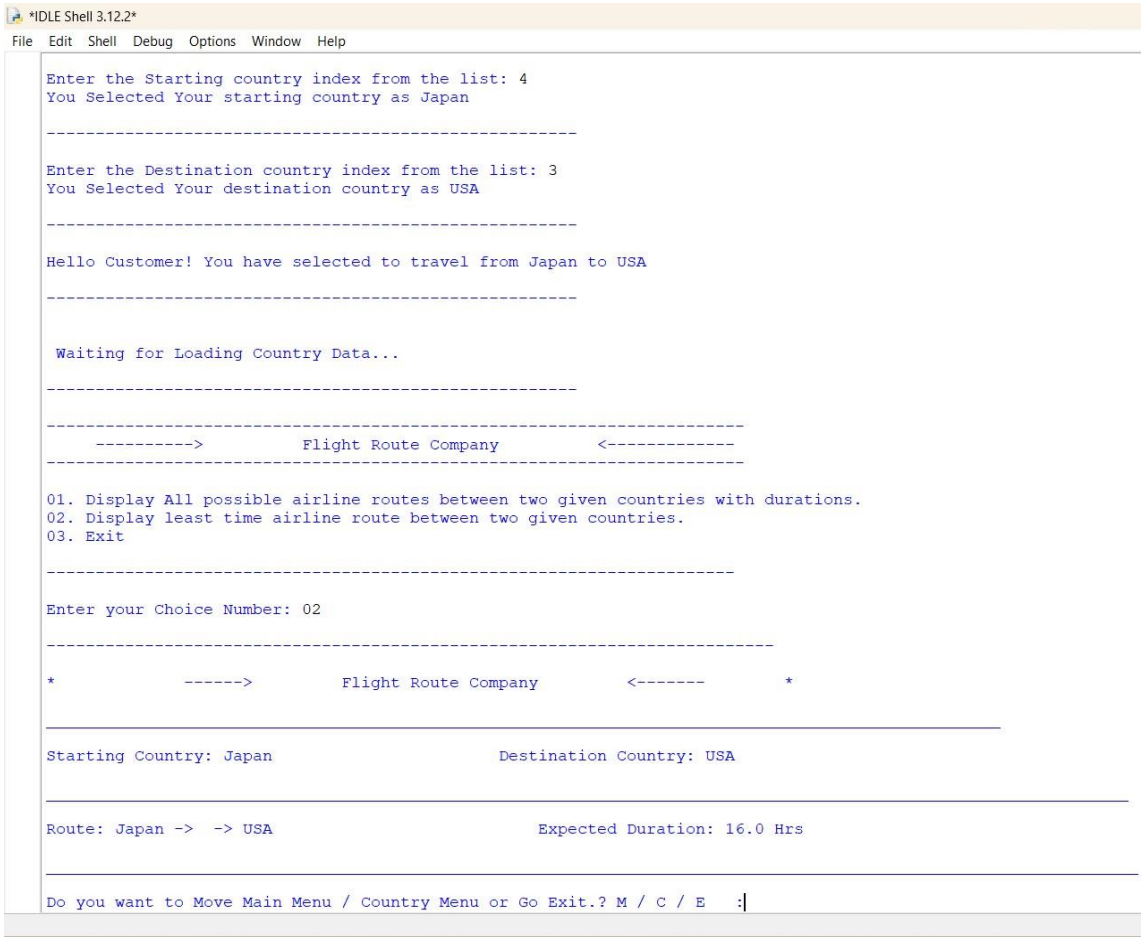


Figure 10. Test case-10

5. Conclusion

This program, written in python, simulates a leading airline route company's system to allow users select from a predefined countries list as starting or destination country as well as lets them choose between options like showing possible airlines routes along with corresponding durations and the one with the least time among the options. It use data validation mechanism for choice of country menu and selection of meals to provide a user-friendly interaction between the passenger and flight routing system.

6. References

01. W3Schools (1998). *W3Schools Online Web Tutorials*. [online] W3schools.com. Available at: https://www.w3schools.com/.

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