Delay Cost Model Software

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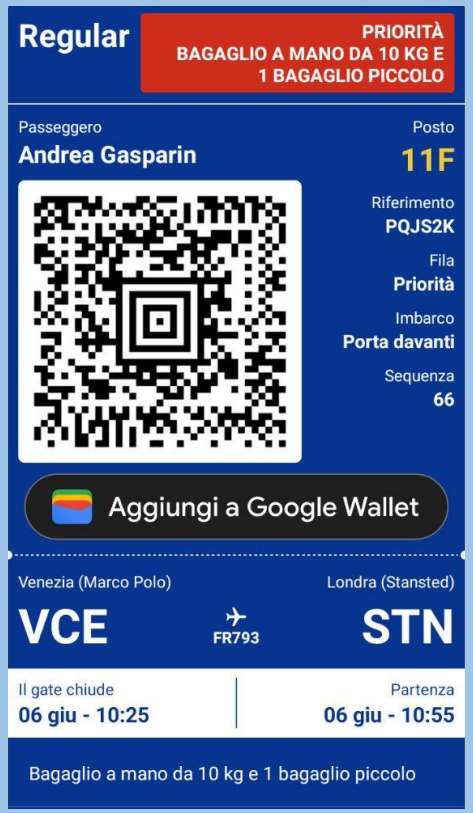
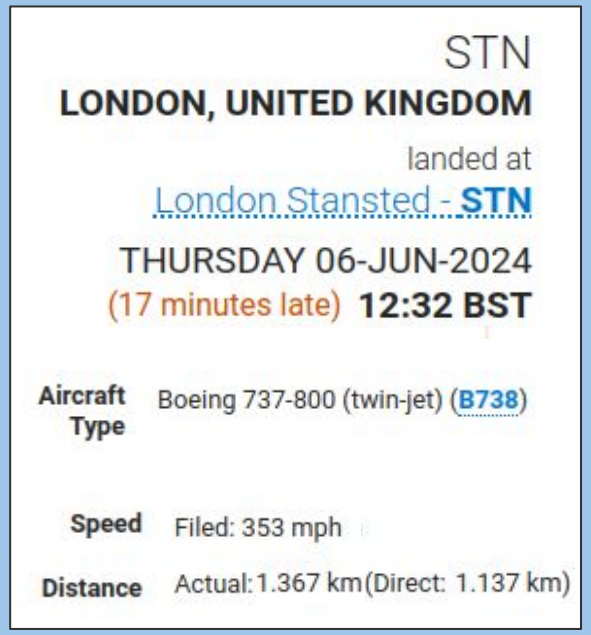
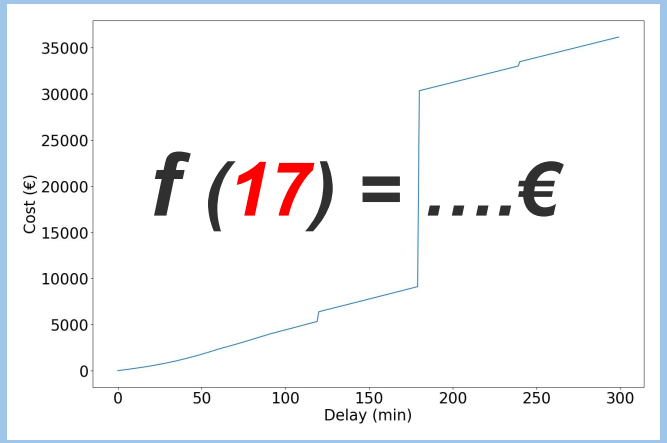
Research question

What was the cost of the 17 minutes of delay of my yesterday's flight?







Cost items

- Crew
- Maintenance
- Fuel
  - At gate
  - Taxiing
  - En-route
- Passengers
  - Hard
  - Soft
- Curfew

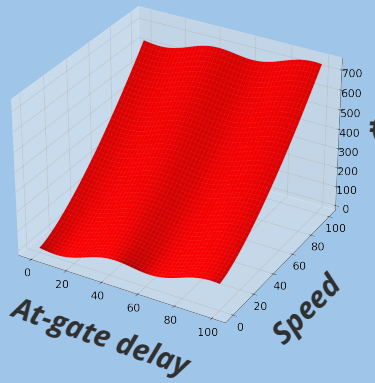
European airline delay cost reference values.
Graham Tanner, Andrew Cook. 2015.

D3.2 Industry briefing on updates to the European cost of delay.
Tatjana Bolic, Andrew Cook, Graham Tanner. 2021.

Is it enough?

Our goal: ***f(d)= €***

f(d, v)= €



Gate-to-gate time

Passengers delay costs

delay

Ground delay at-gate

Passengers delay costs

delay

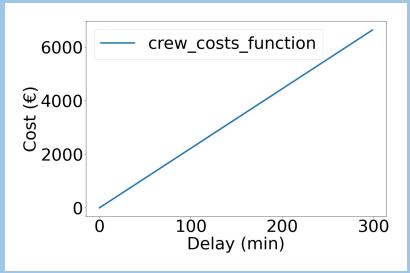
Additional fuel costs

Additional fuel costs

Our delay cost model

Assumption: at gate

APU



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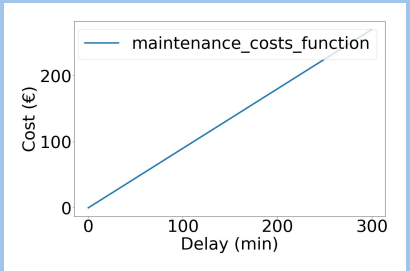

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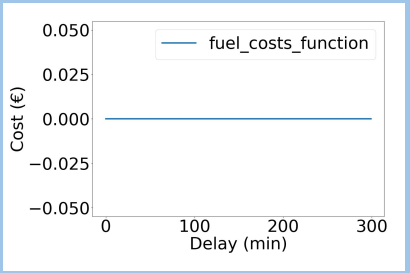

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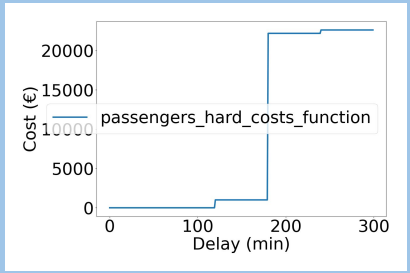

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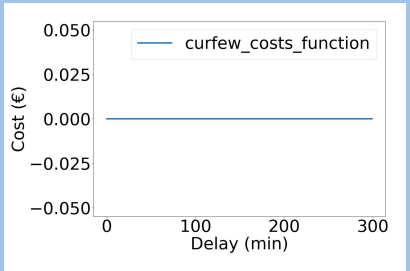

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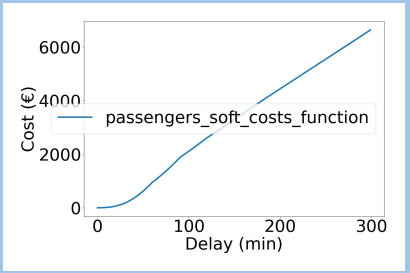

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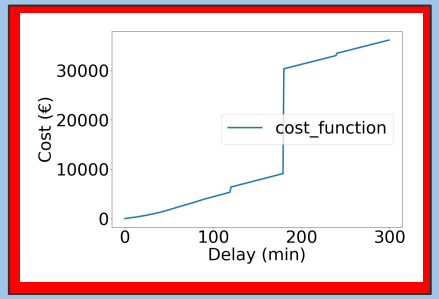


Back to our case

STN

LONDON, UNITED KINGDOM

landed at

London Stansted - **STN**

THURSDAY 06-JUN-2024

(17 minutes late) **12:32 BST**

Aircraft Type	Boeing 737-800 (twin-jet) (**B738**)
Speed	Filed: 353 mph
Distance	Actual: 1.367 km (Direct: 1.137 km)

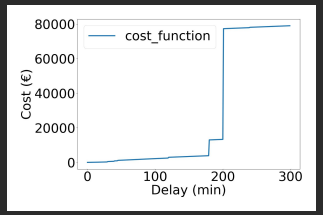
INPUT

```
cost_object = get_delay_cost(aircraft_type='B738', passengers=179,
                             is_low_cost_airline=True,
                             flight_length=1367, destination_airport='EGSS')

cost_object.plot(fig_size=(15, 10), font_size=25)
print('value: ', cost_object.cost_function(17))
```

OUTPUT

```
>>>
```




```
>>> value:  12.714338986666668
```

General case

```
def get_delay_cost(aircraft_type: str,
                   passengers: int | str = None,
                   is_low_cost_airline: bool = None,
                   flight_length: float = None,
                   destination_airport: str = None,
                   crew_costs: float | str = None,
                   maintenance_costs: float | str = None,
                   missed_connection_passengers: List[Tuple] = None,
                   curfew: tuple[float, int] | Union[int, float] = None
                   ) -> CostObject:
```

Current Limitations and Potential extensions

Limitations:

- Currently At-gate
- APU costs (under refinement)
- Curfew costs to be updated

Next extensions:

- Taxiing

Future extension:

- En-route fuel costs

Thank you for the attention