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Mary, an amateur pilot flying a Cesna 174, wants to fly from Seattle to the Comox Valley. That evening, Mary and her wife Louise want to have dinner at the Atlas Cafe, stay in a nearby hotel, and fly back to Seattle the next morning.

**Problem 1: Book a landing time**

The Courtenay airpark allows pilots to land every 15 minutes until 6:00 pm.

Pilots must book their landing time 2 weeks in advance.

Mary and Louise will leave work early so that they can arrive before the 6:00 pm deadline. Write an algorithm that will determine the first available landing time that Mary can book based on when they leave.

Solution (in English)

* Find out (input) how long the trip will take from take off to landing. Store it in a variable called ‘tripLength’
* Find out when Mary and Louise are able to leave. Store it in a variable called ‘leaveTime’
* Calculate leaveTime plus tripLength. Store it in a variable called ‘minTime’
* Find out the available landing times. Store it in a variable called ‘availableTimes’
* Compare minTime to each availableTime
* If availableTime is earlier than minTime, move to the next availableTime
* if availableTime is equal to or later than minTime, book this time

Solution (flowchart)



**Problem 2: Decide if a Courtenay landing is safe**

While on route, Mary receives a dangerous wind warning for the Courtenay area.

She knows that if winds are greater than 12 knots, she can’t land safely because the Courtenay airfield is close to the ocean and has high winds.

Smits Field is a nearby airfield that is protected from the wind and allows emergency landings but it’s a 30-minute drive to Courtenay, and Louise would need to contact the airstrip Marshall to reserve the loaner car they make available for such occasions. Write an algorithm that will tell Mary if she can land in Courtenay or if she has to go to Smits Field.

(Note: you can name your variables whatever you want)

Solution (Problem 2 in English):

* Find out (input) the wind speed in the Courtenay area. Store it in the “windSpeed" variable.
* Store the (input) drive-time to Courtenay in the variable named ‘driveTime’.
* Calculate the wind speed as well as drive time to Courtenay whether they can land safely at the airport without overshooting the runway.

Solution (Problem 2 in flowchart):

**Problem 3: Find an alternate landing time / location**

Wind was less than 12 knots so Mary could safely land in Courtenay, but the wind conditions delayed their leave time and has slowed down their travel so that their overall travel time is longer than expected. Mary will not make her booked landing time. Write an algorithm that will determine if there is a later landing time available in the Courtenay airfield. If not, she will have to default to Smits Field.

Solution (Problem 3 in English):

* Find out the (input) total travel time. Store the value in the variable (totalTravelTime).
* Find out the (input) delayed leave time that has slowed down their travel. Store the value in the variable (delayedTravelTime).
* Initiate a variable named (availableTime).
* Initiate another variable named (delayedTime).
* Calculate the time of their delayed travel by subtracting total time and delayed time. Store the value in the variable (totalDelayed).
* Compare the values in the variable to determine whether Mary is able to land in the Courtenay airfield or not.
* Output the value if she is available else output the value of the value of the default value location.

Solution (Problem 3 in Flowchart):



**Problem 4: Book a dinner reservation**

While Mary is figuring out which airfield to land in, Louise needs to book a reservation at the Atlas Cafe. She was given a list of open times for the reservation. Based on the place they land, she needs to add 20 minutes (Courtenay) or 45 minutes (Smits Field) to their landing time to determine the reservation time. She also needs to book either a taxi (Courtenay) or the airfield loaner car (Smits Field). Write an algorithm that will take the necessary outputs from Problem 3 and determine which reservation time and mode of transportation she needs to book.

For this problem, assume that Atlas Cafe will have an available reservation time.

(You do not need to duplicate 3, just start 4 as if adding on to 3)

Solution (Problem 4 in English):

* Taking the variable from the problem 3 (delayedTime) to determine which airport the plane lands.
* Initiate a variable named (LandingTime).
* Calculate where the plane land and add 20 minutes landingTime to the delayedTime for Courtenay airfield and 45 minutes to landingTime to Smits field.
* Compare whether a taxi is needed or a airfield loaner car.

Solution (Problem 4 in FlowChart)