C++ Internship Take-home Test

Simulate a parking reservation system in a city.

Your job is to simulate this city-wide parking system in a simple console application. We're not trying to build a mobile app here :) rather we're interested in the data architecture, models, the simulation, price calculations, etc. **Feel free to experiment with different ways to express this simulation.**

Be aware of the following details :

You have a large set of parking areas across the city (each with a unique ID) and each having a certain amount of parking spaces (capacity). Simulate the process of booking a parking space for a car.

A car arrives at a parking location at a given time (current time) and if there is a spot available, the driver opts for a preferred predefined park interval: 15min, 30min, 45min, 1hour, 1:15h, 1:30h, …

There are 3 types of parking zones in the city: Orange (short term parking: 15min-1h), Purple (15min-3h) and Blue (15min-24h). Prices differ depending on location (city center, busy areas, residential areas, etc). Some parking zones have a low price (eg. 20 coins / hour), while some other zones might have higher prices (eg. 80 coins / hours). For all zones, price calculation allows for 15 minute increments and hourly breakdown. Eg, if Zone ID-0018 has the hourly price of 40 coins / hour and you book parking for 1:15h, you pay 50 coins in total.

Bonus tasks:

1) A driver can receive a notification that their parking is about to expire in 10 minutes and have the option to extend their booking by an interval of their choice, not exceeding the total time allowed for a stay at that specific location.
(notifications are always sent 10 min before expiration, but the driver might choose to act upon it later on… or never)

2) For some busy parking zones, prices might fluctuate during the day (more expensive at busy hours), but not dynamically/adaptive, rather predictable (known upfront to the driver). Eg, for Zone ID-0144 price is regularly 30 coins / hour, except between 9am-12pm when the price is 60 coins / hours.

Send your solutions to **cariere@caphyon.ro** with the subject "C++ Internship Test" in 14 days.