C# Assignment 2

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This assignment is worth 20% of your final grade in the course

For each question, accomplish the following tasks:

- (Quantitative: 2 Marks) Create ASP.NET Core Web API Controllers that implement the desired functionality. If you have trouble, describe your approach using code comments.
- (Qualitative: 2 Marks) Use descriptive variable names, and a `<summary>` block above each method, with the following:
    - A general <summary> of what the endpoint does
    - A description of what the endpoint `<returns>`
    - A description of each input `<param>eter`
    - At least one `<example>`
- (Testing: 2 Marks) Include evidence of thoroughly testing your work using cURL

RUBRIC

	`0 Marks`	`1 Mark`	`2 Marks`
`Quantitative`	Method not implemented	Method partially implemented / implemented with room for improvements	Method implemented, no improvements required
`Qualitative`	Documentation not included	Documentation partially included / included with room for improvements	Documentation included, no improvements required
`Testing`	Testing not included	Testing partially included / included with room for improvements	Testing included, no improvements required

How to submit

1. Use Visual Studio / git to push your work to a remote repository
2. Verify the repository:
    a. contains the work you wish to submit (i.e. the files are there)
    b. is public (if it is set to private, change it to public!)
3. Include repository github link as part of your assignment submission (Do not share the link or your work with anyone else)
4. Include evidence of your testing as a PDF with screenshots of your cURL commands

The Canadian Computing Competition (CCC) is a yearly competition hosted by the University of Waterloo. The past contests are available through the link below.

https://cemc.uwaterloo.ca/resources/past-contests#ccc?grade=19&academic_year=All&contest_category=29

Question 1

Solve the below J1 problem “Deliv-e-droid”

Question 2

Solve a *different* J1 problem than Question 1 from a previous contest year.

Question 3

Solve the below J2 problem “Chili Peppers”

Question 4

Solve a *different* J2 problem than Question 3 from a previous contest year.

Question 5

Solve a J3 problem from a previous contest year.

Note on Inputs:

The questions on the CCC assume that the program input works through a terminal. Below are two questions which have been modified to work with a single HTTP request, rather than multiple rounds of input from the user. Read the original question linked, and observe how the question context is changed.

Adapted J1 - Deliv-e-droid

Source : https://cemc.uwaterloo.ca/sites/default/files/documents/2023/juniorEF.pdf

In the game, Deliv-e-droid, a robot droid has to deliver packages while avoiding obstacles.
At the end of the game, the final score is calculated based on the following point system:

- Gain 50 points for every package delivered.
- Lose 10 points for every collision with an obstacle.
- Earn a bonus 500 points if the number of packages delivered is greater than the number of collisions with obstacles.

Your job is to determine the final score at the end of a game.

Request	Response

`POST : localhost:xx/api/J1/Delivedroid`
`Content-Type: application/x-www-form-urlencoded`
`Request Body:`
`Collisions=2&Deliveries=5`
	`730`

`POST : localhost:xx/api/J1/Delivedroid`
`Content-Type: application/x-www-form-urlencoded`
`Request Body:`
`Collisions=10&Deliveries=0`
	`-100`

`POST : localhost:xx/api/J1/Delivedroid`
`Content-Type: application/x-www-form-urlencoded`
`Request Body:`
`Collisions=3&Deliveries=2`
	`70`

Adapted J2 - Chili Peppers

Source : https://cemc.uwaterloo.ca/sites/default/files/documents/2023/juniorEF.pdf

Ron is cooking chili using an assortment of peppers.

The spiciness of a pepper is measured in Scolville Heat Units (SHU). Ron's chili is currently not spicy at all, but each time Ron adds a pepper, the total spiciness of the chili increases by the SHU value of that pepper.

The SHU values of the peppers available to Ron are shown in the following table:

Pepper Name	Scolville Heat Units
Poblano	1500
Mirasol	6000
Serrano	15500
Cayenne	40000
Thai	75000
Habanero	125000

Request	Response
`GET : localhost:xx/api/J2/ChiliPeppers&Ingredients=Poblano,Cayenne,Thai,Poblano`	`118000`
`GET : localhost:xx/api/J2/ChiliPeppers&Ingredients=Habanero,Habanero,Habanero,Habanero,Habanero`	`625000`
`GET : localhost:xx/api/J2/ChiliPeppers&Ingredients=Poblano,Mirasol,Serrano,Cayenne,Thai,Habanero,Serrano`	`278500`

Hint: String.Split