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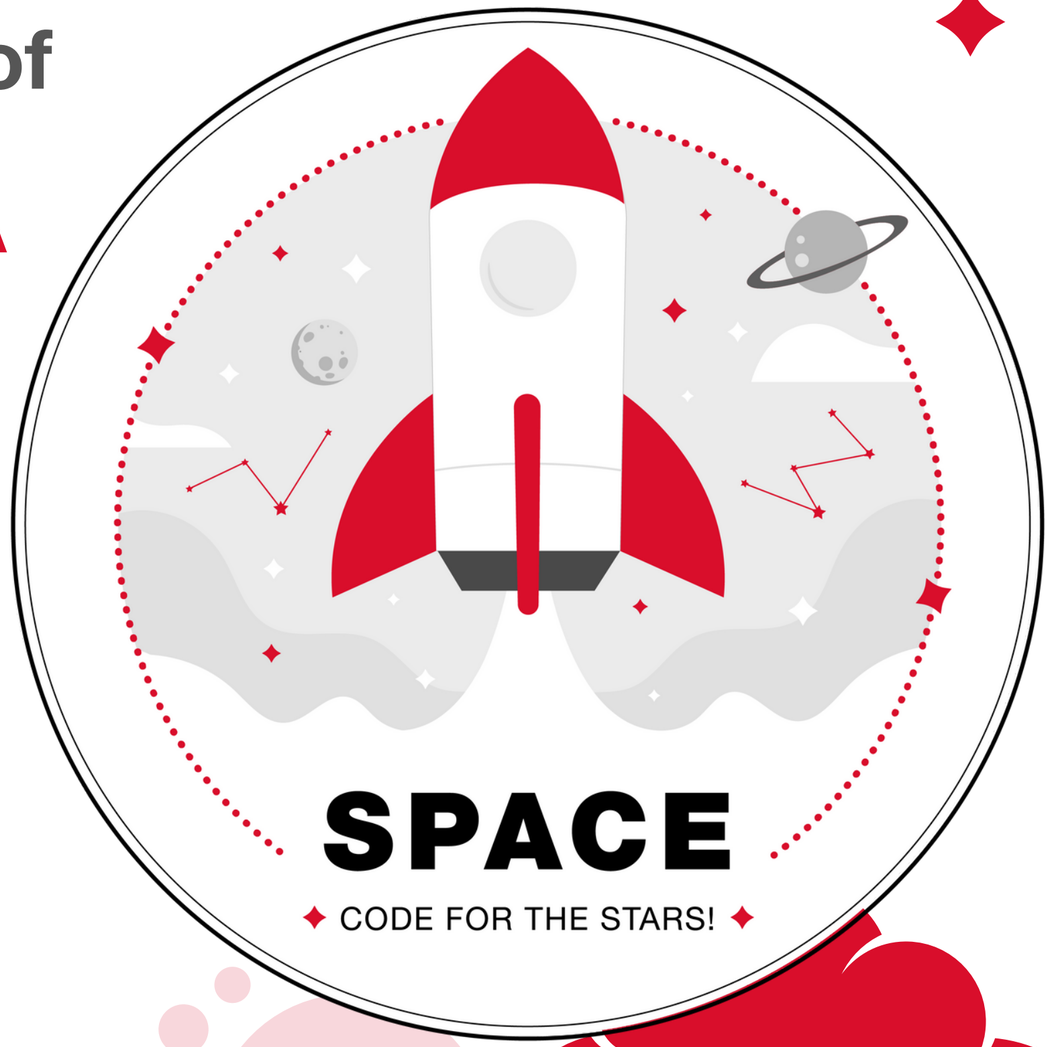
Welcome to the SPACE Programme of

HITACHI SOLUTIONS BULGARIA



Assessment Task

Edition 2023

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ARE YOU READY TO GO

INTO SPACE?

Task:

Weather conditions for SPACE shuttle launch

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Introduction

Welcome on board, Azure Astronaut!

We have all the equipment now prepared for you, we have our SPACE shuttle packed with exciting Microsoft-fuelled technology ready, all of our crew is on standby, and we are now ready to go … besides one crucial thing!

We need all your software engineering superpowers to manage a couple of technical tasks in the control room before we dive into SPACE! Use all your debris of stardust knowledge on the core development concepts and object-oriented programming, follow the instructions and launch us into SPACE!

We are counting…3, 2, 1, 0.

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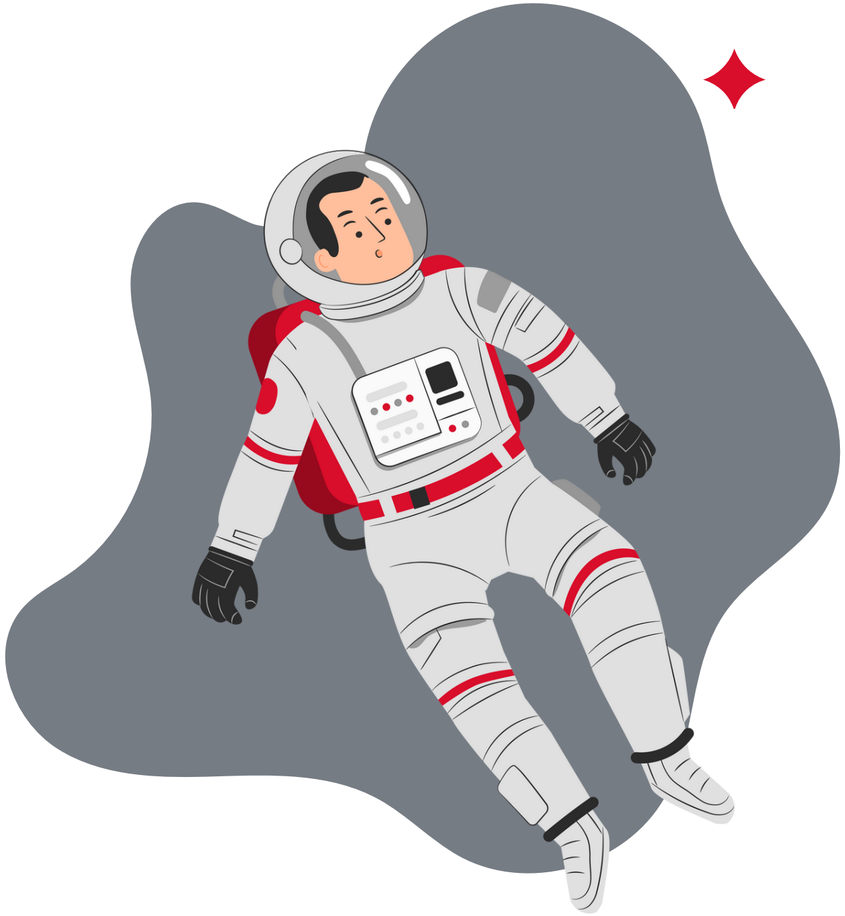
Task details

You are preparing for a SPACE mission.

You are in the SPACE mission control centre.

Your task is to calculate which is the most appropriate day for the SPACE shuttle launch based on the weather conditions.

You have the weather forecast for the first half of July and the weather criteria for a successful shuttle launch.



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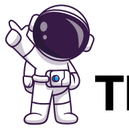
Task details 1

Create the following C# (.NET Core) Console Application:



The application should take 4 input parameters – File name (path to the file on the file system), Sender email address, Password, Receiver email address.

The type of the accepted input file for the weather forecast (filename parameter) is CSV and has the following structure (this is sample data; you can create your own and we mean to test it with more/different data):

Day/Parameter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Temperature (C)	28	28	29	30	31	32	31	30	28	28	27	29	31	32	32
Wind (m/s)	15	13	12	14	11	10	6	5	4	3	2	3	2	2	2
Humidity (%)	20	30	30	35	60	70	80	60	30	20	25	20	15	15	20
Precipitation (%)	0	0	0	0	20	40	30	20	0	0	0	5	5	0	0
Lightning	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No
Clouds	Cumulus	Cumulus	Stratus	Stratus	Stratus	Nimbus	Nimbus	Stratus	Cumulus	Cirrus	Cumulus	Stratus	Cirrus	Cirrus	Cirrus

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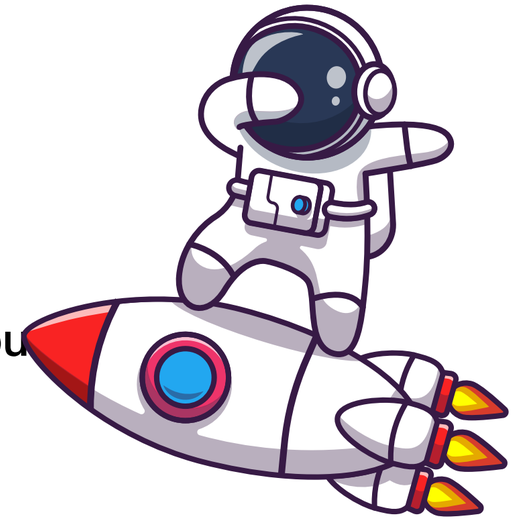
Task details 2

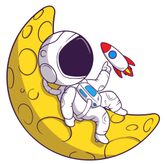
The criteria for the weather conditions for a rocket launch is as follows:

- Temperature between 2 and 31 degrees Celsius;
- Wind speed no more than 10m/s (the lower the better);
- Humidity less than 60% (the lower the better);
- No precipitation;
- No lightings;
- No cumulus or nimbus clou



The application should calculate the most appropriate date for the space shuttle launch based on the above criteria and create new CSV file named “WeatherReport.csv” containing the same Parameter rows and for every Parameter aggregate the data for the given period as such:

- Average value
- Max value
- Min value
- Median value
- Most appropriate launch day parameter value



For the non-number parameters, leave the aggregates blank but populate the launch day values.

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Task details 3

The proposed most appropriate launch date and newly generated csv file should be sent to the email (4th input parameter). This will happen by using the 2nd and 3rd input parameters (Sender mail and Password) to establish connection using SMTP and send the file as attachment to the email. Hint: using Gmail smtp could be difficult because they have additional security. Try other service like abv.bg, for example.

The completed application source code should be sent as exported project or
uploaded to accessible version control platform (GitHub, for example) for review.

Bonus tasks:

- Make the application UI multilingual (English & German) with the ability to change the language.
- Allow weather criteria (part or all of it) to be entered as input parameters to enable more flexibility.

Considerations:

- Application should provide user-friendly experience.
- Implement error handling (for example, a simple message “File is not found” instead of unhandled error and printed call stack).
- Performance of the application will be considered.

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Thank You!