Hitachi Solutions

Welcome to the SPACE Programme of

HITACHI SOLUTIONS BULGARIA

Assessment Task

SPACE
CODE FOR THE STARS!
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CODE FOR THE STARS!
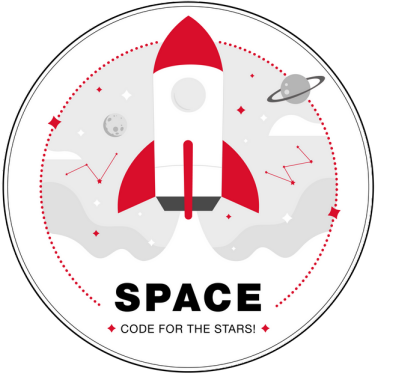
ARE YOU READY TO GO

INTO SPACE?

Task:
Weather conditions for
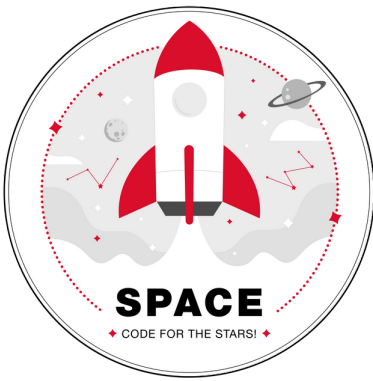# SPACE shuttle launch

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.

Task details

You are preparing for a space mission.

You are in the SPACE mission control centre.

Your task is to analyse the space shuttle launch conditions with regard to weather and location. You need to find the most appropriate date/location for the space shuttle launch based on the weather criteria.

You have the weather forecast for the first half of July for every of the given locations and the weather criteria for a successful space shuttle launch.
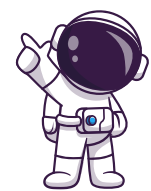
Spaceports:

✦ Kourou, French Guyana
✦ Cape Canaveral, USA
✦ Kodiak, USA

✦ Tanegashima, Japan
✦ Mahia, New Zealand
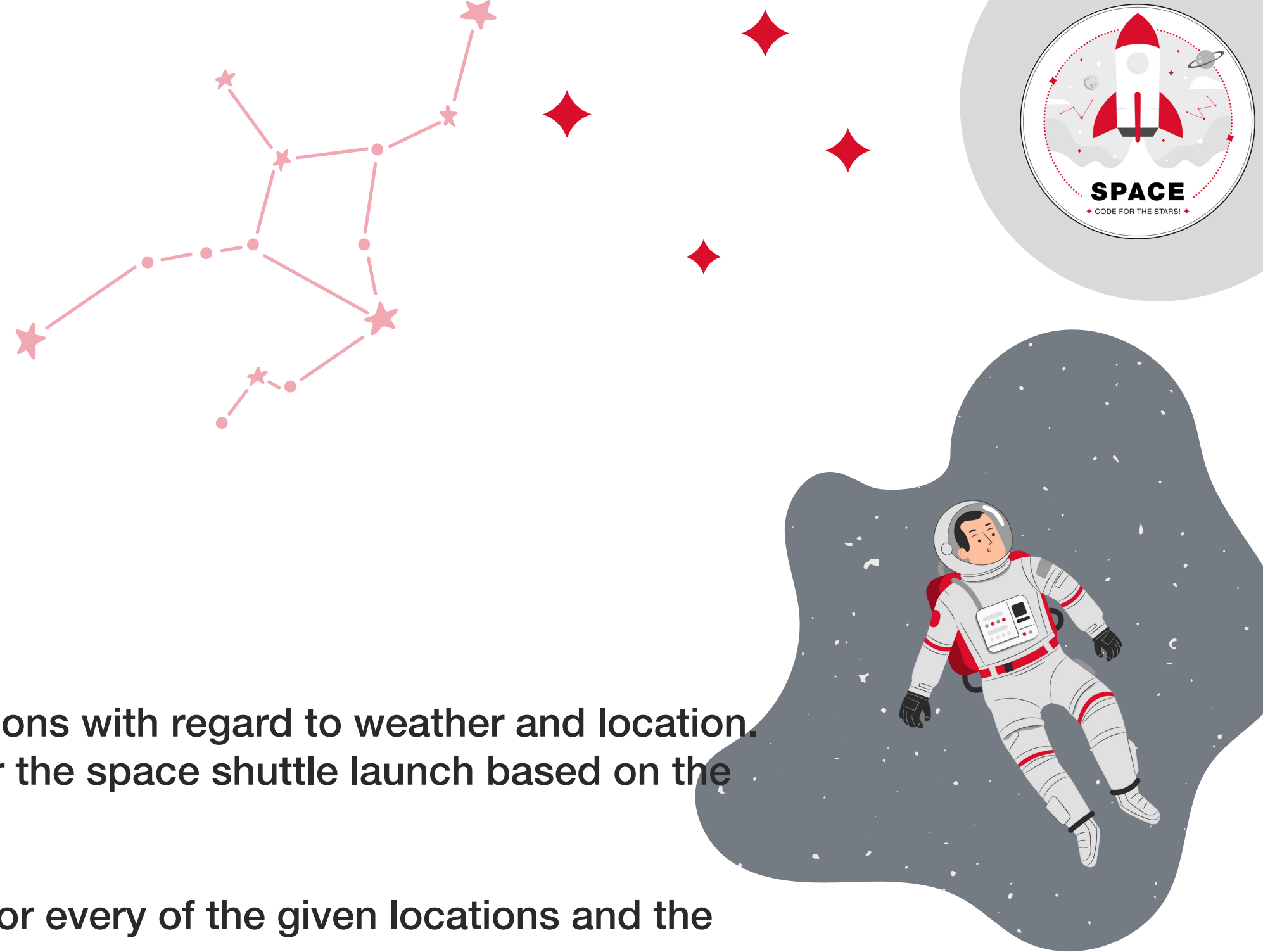
Task details 1

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

◆ Java or C++ are also acceptable, if no experience with C#

The application should take 4 input parameters – Folder name (path to the folder on the file system, containing the weather forecast for every spaceport), Sender email address, Password, Receiver email address.
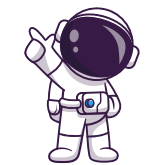
The type of the accepted input file for the weather forecast (contained in the folder) is CSV and has the following structure (this is sample data):

| 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
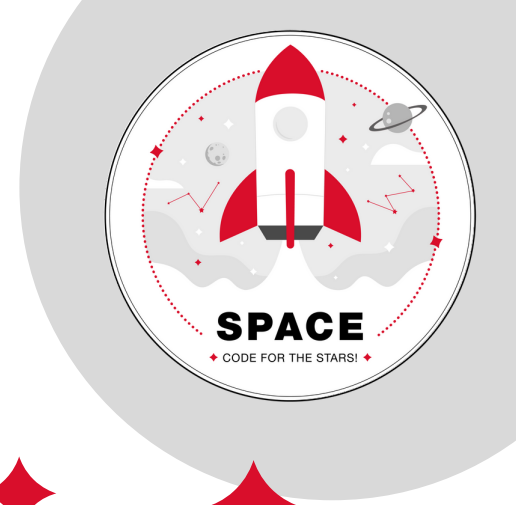
Task details 2

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

- ✦ Temperature between 1 and 32 degrees Celsius;
- ✦ Wind speed no more than 11m/s (the lower the better);
- ✦ Humidity less than 55% (the lower the better);

- ✦ No precipitation;
- ✦ No lightings;
- ✦ No cumulus or nimbus clouds.
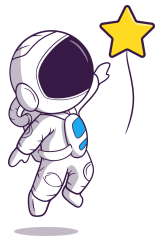
The application should calculate the following:

- ✦ for each spaceport – find the best date for space shuttle launch (1);

- ✦ find the best combination of date and location, if location is considered as better, the closer it is to the Equator (2).
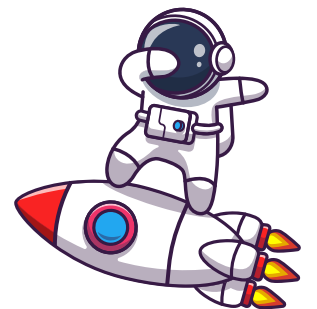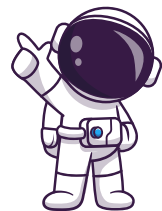
based on the above criteria and create a new CSV file named "LaunchAnalysisReport.csv" containing two columns – the first one is the name of the spaceport, the second one is the result for the best date for the given spaceport

Task details 3

Bonus tasks:

The newly generated CSV file (1) should be sent to the email (4th input parameter). The body of the email should contain the best combination of date and location for the space shuttle launch (2). This will happen by using the 2nd and 3rd input parameters (Sender mail and Password) to establish a connection using SMTP and send the file as an attachment to the email. Hint: using Gmail SMTP could be difficult because they have additional security. Try other services like Outlook, for example.

✦ 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. Also, think about the possibility of having different weather criteria for the different spaceports.

The completed application source code should be sent as an exported project.

Considerations:

✦ The application should provide a user-friendly experience.
✦ Implement error handling (for example, a simple message "File is not found" instead of an unhandled error and printed call stack).
✦ The performance of the application will be considered.
✦ Time taken for completion will be considered.