# Technical Lab Test – S3 Innovate Bangladesh

**Applicant Name:**

**Job Title:**

**There are two problem listed below. Each problem have individual marks. So please do not wait for the result of first one, carry on the second one.**

**Note: Both problem source codes need to be uploaded in git and share the link separately. Also for the problem number 2 need to send the screenshot of the chart page.**

**Problem # 1 (C# Console Application) need to be submitted within one hour.**

**Problem # 2 (Web Application) need to be submitted by 3 days**

**Problem 1:**

Calculate mobile bill between two date times.

Peak Hour: 9.00.00 am to 10.59.59 pm

20 second pulse and each pulse rate 30 paisa

Off-peak Hour: 12.00.00 am to 8.59.59 am and 11.00.00 pm to 11.59.59 pm

20 second pulse and each pulse rate 20 paisa

**Note: If pulse overlap (peak to off-peak or off-peak to peak) then take peak hour rate for that pulse.**

Sample input:

Start time: 2019-08-31 08:59:13 am

End time: 2019-08-31 09:00:39 am

Breakdown (Optional to show):

2019-09-31 08:59:13 + 20 second (2019-09-31 08:59:33) = 20 paisa

2019-09-31 08:59:34 + 20 second (2019-09-31 08:59:54) = 20 paisa

2019-09-31 08:59:55 + 20 second (2019-09-31 09:00:15) = 30 paisa

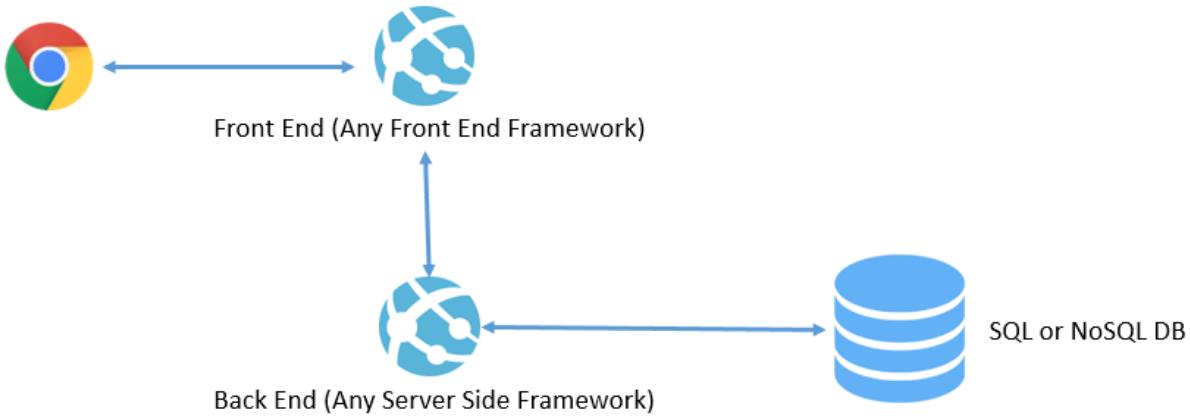
2019-09-31 09:00:16 + 20 second (2019-09-31 09:00:36) = 30 paisa

2019-09-31 09:00:37 + 3 second (2019-09-31 09:00:39) = 30 paisa

Sample output: 1.3 taka

**Problem 2:**

Build a web application where front end (preferred Angular) is separate from back end (preferred asp.net core and c#) to show time series data in chart. Maintain at least below architecture.




**DB Model:**

**Building**

| | Column Name | Data Type | Allow Nulls |
|---|---|---|---|
| 🔑 | Id | smallint | ☐ |
| | Name | varchar(50) | ☐ |
| | Location | varchar(50) | ☑ |
| | | | ☐ |

**Reading**

| | Column Name | Data Type | Allow Nulls |
|---|---|---|---|
| | BuildingId | smallint | ☐ |
| | ObjectId | tinyint | ☐ |
| | DataFieldId | tinyint | ☐ |
| | Value | decimal(18, 2) | ☐ |
| | Timestamp | datetime | ☐ |
| | | | ☐ |

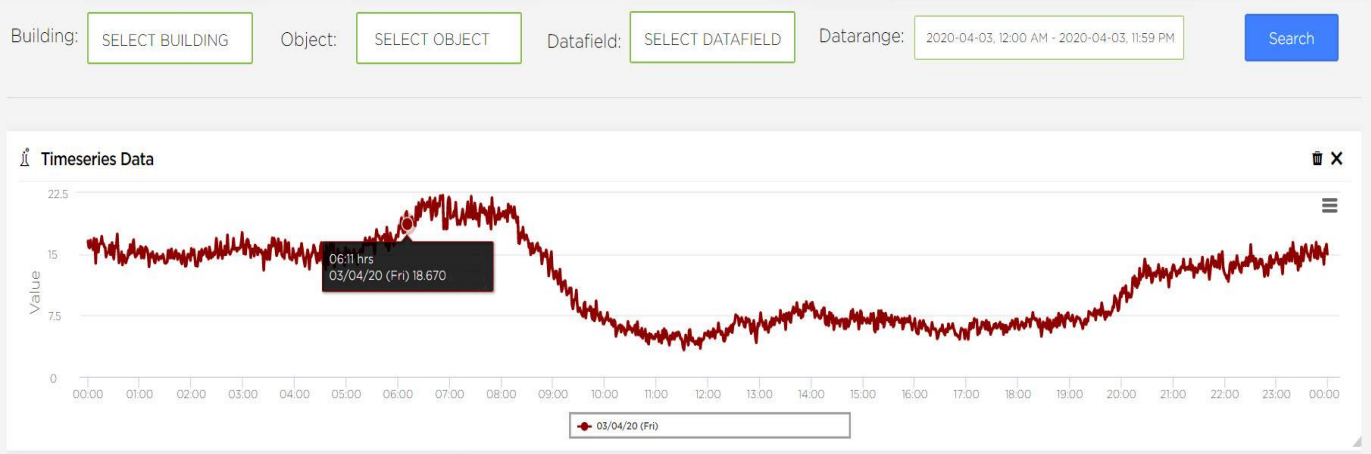
**Object**

| | Column Name | Data Type | Allow Nulls |
|---|---|---|---|
| 🔑 | Id | tinyint | ☐ |
| | Name | varchar(50) | ☐ |
| | | | ☐ |

**DataField**

| | Column Name | Data Type | Allow Nulls |
|---|---|---|---|
| 🔑 | Id | tinyint | ☐ |
| | Name | varchar(50) | ☐ |
| | | | ☐ |

**UI:**




**Some instructions as listed below:**

1. You need to create sample data yourself.
2. Total number of buildings 100.
3. Need to generate 2-year data for each building and each timestamp has 10 datapoint. Time interval 1 minute.
1. For each building, daily timestamp 1440 so daily data rows 14,400 and yearly 5,256,000 rows and for 2-year 10,512,000
2. For 100 buildings total data rows 1,051,200,000
3. X axis will be the timestamp.
4. Y axis will be the value.
5. There will be three dropdowns. One for select Building, one for select Object and another one for select DataField.
6. There will be a date-time range picker, so date range can be selected like one month, two-month date range etc.
7. Need to think about how to show the data for a big date range in an efficient way.
8. Design should be responsive in all device ratios.
9.

**What will be tested?**

1. How much efficiently you can load data in chart for data range, suppose 1 month, 2-month, 3 month etc.
2. Project architecture.
3. OOP concept.
4. Deliver project on time or not.
5. Cutting edge technologies applied or not.