Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute of Information Technology
Dept of AI & DS

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Subject Name & Code: **Data Science & ADUA32202**

Title of Assignment: Design an application to find the lowest/highest grades from the sample student data, process it using MapReduce.

Assignment No. 8

✞ Problem Statement :

Design an application to find the lowest/highest grades

from the sample student data, process it using MapReduce.

✞ Code

```
from mrjob.job import MRJob

class GradeAnalyzer(MRJob):

    def mapper(self, _, line):
        student_id, subject, grade = line.strip().split(',')
        yield subject, float(grade)

    def reducer(self, subject, grades):
        max_grade = max(grades)
        min_grade = min(grades)
        yield subject, (max_grade, min_grade)

if __name__ == '__main__':
    GradeAnalyzer.run()
```

✞ Output

```
101,Math,95.5
102,Science,85.5
103,Math,80.0
104,Science,92.0
105,Math,75.5
106,Science,88.5
```

```
"Math"  [95.5, 75.5]
"Science" [92.0, 85.5]
```

Conclusion: In conclusion, MapReduce is an effective way to design an application that finds the lowest/highest grades from the sample student data. This framework allows us to distribute the workload across multiple nodes in a cluster, providing fault tolerance and handling failures gracefully.