Matrix Algebra Notes

Example 1: addition

|  |  |  |  |
| --- | --- | --- | --- |
|  | Grade 1 | Grade 2 | Grade 3 |
| Student 1 | 3 | 8 | 6 |
| Student 2 | 4 | 7 | 2 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Grade 1 | Grade 2 | Grade 3 |
| Student 1 | 8 | 2 | 1 |
| Student 2 | 0 | 4 | 3 |

2X3 Matrices A + B =

|  |  |  |  |
| --- | --- | --- | --- |
|  | Grade 1 | Grade 2 | Grade 3 |
| Student 1 | 11 | 10 | 7 |
| Student 2 | 4 | 11 | 5 |

A – B =

|  |  |  |  |
| --- | --- | --- | --- |
|  | Grade 1 | Grade 2 | Grade 3 |
| Student 1 | -5 | 6 | 5 |
| Student 2 | 4 | 3 | -1 |

2A =

|  |  |  |  |
| --- | --- | --- | --- |
|  | Grade 1 | Grade 2 | Grade 3 |
| Student 1 | 6 | 16 | 12 |
| Student 2 | 8 | 14 | 4 |

Multiplication examples

Basically all the math you’ve done before is a 1X1 matrix.

|  |
| --- |
| 2 |
| 4 |

|  |  |
| --- | --- |
| 5 | 3 |

2X1 … 1X2 = 2x2

|  |  |
| --- | --- |
| 2\*5 = 10 | 2 \* 3 = 6 |
| 4\*5 = 20 | 4\*3 = 12 |

2x2 \* 2x2 = 2x2

|  |  |
| --- | --- |
| 0 | 2 |
| 3 | 4 |

|  |  |
| --- | --- |
| 5 | 3 |
| 9 | 1 |

|  |  |
| --- | --- |
| 0\*5 + 2\*9 = 18 | 0\*3 + 2\*1 |
| 3\*5 + 4\*9 = 51 | 3\*3 + 4\*1 = 13 |

Identity Matrix

|  |  |
| --- | --- |
| 1 | 0 |
| 0 | 1 |

Transposes

|  |  |  |
| --- | --- | --- |
| 5 | 4 | 9 |
| 2 | 1 | 3 |
| 7 | 8 | 6 |

|  |  |  |
| --- | --- | --- |
| 5 | 2 | 7 |
| 4 | 1 | 8 |
| 9 | 3 | 6 |

Determinant

|  |  |  |
| --- | --- | --- |
| 5 | 4 | 9 |
| 2 | 1 | 3 |
| 7 | 8 | 6 |

For 3X3

5(6-24) – 4(12-21) + 9(6-24)





