Linear Algebra For ML: Session 1

1. **Recaps on sets and functions**
2. **Linear Algebra For ML: Motivations**
3. **Vector space**
4. **Vectors and Matrices Notations**
5. **Vector-vector operations:**
    a. Inner/dot /scalar product and orthogonal vectors
    b. Outer product
    c. Hadamard (element wise) product
    d. p-norm
    e. Unitary vector
    f. Orthonormality
    g. Projection
    h. Cosine similarity
6. **Matrix-vector operations**
    a. Matrix-vector product
7. **Matrix-Matrix operations:**
    a. Matrix-Matrix product
    b. Trace
    c. Determinant
    d. Matrix norms: 1-norm, infinity-norm, Frobenius norm, and 2-norm
8. **Linear combination, linear dependence/independence, span, basis and Rank**
9. **Linear mapping**
10. **Fundamental subspaces (optional)**