# Analyzer Report {Loop Blocking}

This report generated by Convolutional Neural Network Inference Analyzer (CNN-IA) to summarize the analysis needed to reach the optimal loop blocking for mlp_fc3_batch16 using restricted schedule space.

## Memory Architecture:

| | L0 | L1 | L2 |
|---|---|---|---|
| **Capacity** | 16 | 16384 | 536870912 |
| **Access cost** | 0.05 | 3.84 | 200.0 |
| **Static cost** | 0.0 | 0.0 | 0.0 |
| **Parallel count** | 256 | 1 | 1 |
| **Parallel mode** | 1 | 0 | 0 |
| **Parallel cost** | 2.0 | 0.0 | 0.0 |

**Precision** : 16
**Minimum utilization** : 0.0%
**Outputs can be buffered by MAC** : 0
**Replication to improve utilization** : True

## Glossary:

- Memory Levels : ( L0, L1, L2 )
  The smallest index the nearest to CPU.

- Loop Notations : ( FX, FY, OX, OY, OC, IC, ON )

**FX** : FILTER WIDTH
**FY** : FILTER HEIGHT
**OX** : OUTPUT WIDTH
**OY** : OUTPUT HEIGHT
**OC** : OUTPUT CHANNEL
**IC** : INPUT CHANNEL
**ON** : BATCH

# Map Configuration

## Loop Blocking (factors):

| | L0 | L1 | L2 |
|---|---|---|---|
| FX | 3.0 | 1.0 | 1.0 |
| FY | 1.0 | 1.0 | 1.0 |
| OX | 1.0 | 1.0 | 1.0 |
| OY | 1.0 | 1.0 | 1.0 |
| OC | 3.0 | 5.0 | 5.0 |
| IC | 1.0 | 1.0 | 500.0 |
| ON | 1.0 | 16.0 | 1.0 |

## Loop Partitioning (units):

| | L0 | L1 | L2 |
|---|---|---|---|
| FX | 1.0 | 1.0 | 1.0 |
| FY | 3.0 | 1.0 | 1.0 |
| OX | 1.0 | 1.0 | 1.0 |
| OY | 13.0 | 1.0 | 1.0 |
| OC | 4.0 | 1.0 | 1.0 |
| IC | 1.0 | 1.0 | 1.0 |
| ON | 1.0 | 1.0 | 1.0 |

## Loop Ordering (from the innermost):

| | L0 | L1 | L2 |
|---|---|---|---|
| FX | 0.0 | 6.0 | 6.0 |
| FY | 1.0 | 6.0 | 6.0 |
| OX | 6.0 | 6.0 | 6.0 |
| OY | 2.0 | 6.0 | 6.0 |
| OC | 3.0 | 1.0 | 1.0 |
| IC | 6.0 | 6.0 | 0.0 |
| ON | 6.0 | 0.0 | 6.0 |

(Hinted schedule configurations are in green)

# Schedule

## The Best format for schedule found is :

**MEM - L2:**
**for ( OC, 5b, 1p )**
**for ( IC, 500b, 1p )**

**MEM - L1:**
**for ( OC, 5b, 1p )**
**for ( ON, 16b, 1p )**

**MEM - L0:**
**for ( OC, 3b, 4p )**
**for ( OY, 1b, 13p )**
**for ( FY, 1b, 3p )**
**for ( FX, 3b, 1p )**
**spatially unrolled loops: (FX)(FY)(OY)(OC)**

**(Hinted loop unrollments are in green)**

# Cost

| MEM | ENERGY (PJ) |
|---|---|
| L0 | 399800.0 |
| L0-PARA | 20050000.0 |
| L1 | 16592640.0 |
| L2 | 33800000.0 |
| TOTAL | 70842440.0 |