



And lattice open end...

For computing $M_2(\Gamma_0(N))$:

- "Compute" G_P ($P = \Gamma_0(N)$)
- Compute a ~~basis~~ basis for $X_2(P) : \lambda_1, \dots, \lambda_d$
- Compute $\sum_{L_2 \leq L \leq L_1} (\nabla(L) \lambda_i)(v) q^L$ for $v \in G_P$

for sufficiently large L , such that you find
 a way to write v as a poly in λ_i 's
 the corresponding power series for a basis for $M_2(\Gamma_0(N))$.

- Remarks
- There exist variants of this algo to
 - compute more efficiently
 - algebraically Hecke eigen new forms
 - improve the formulas for $\nabla(L)$
 - etc.
 - Works mutatis mutandis also for higher weight.