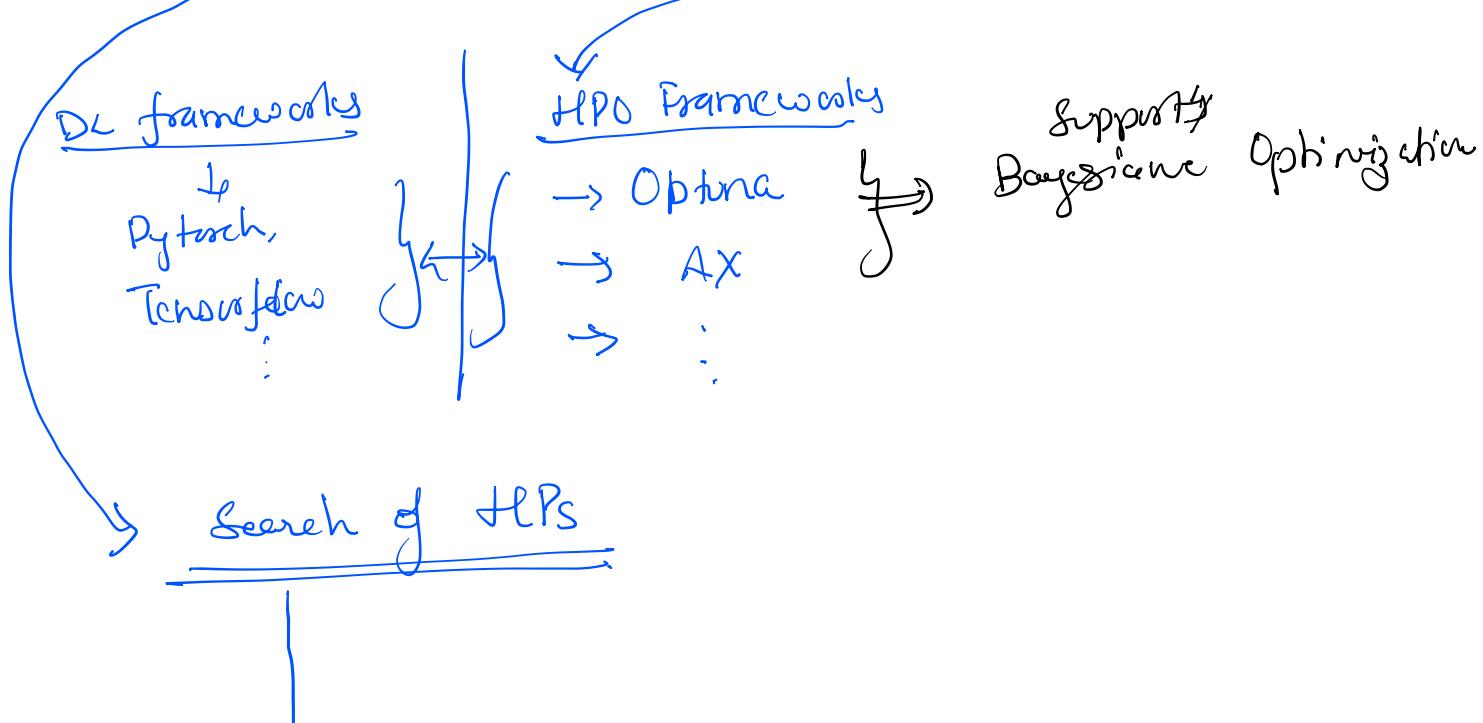
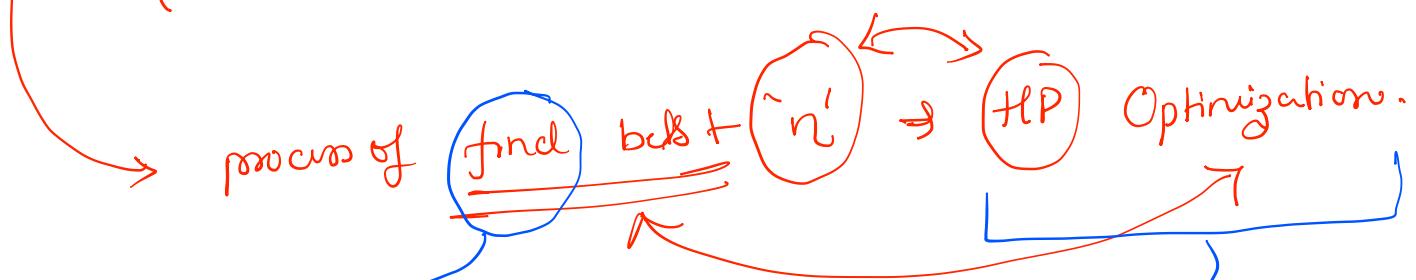
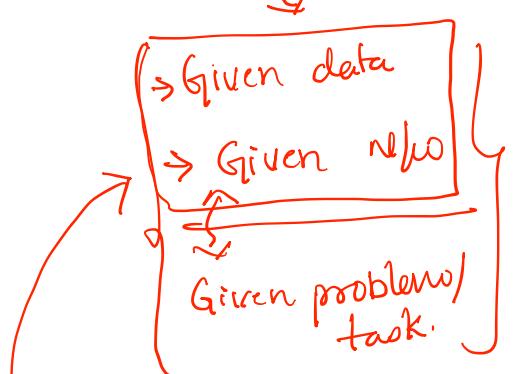


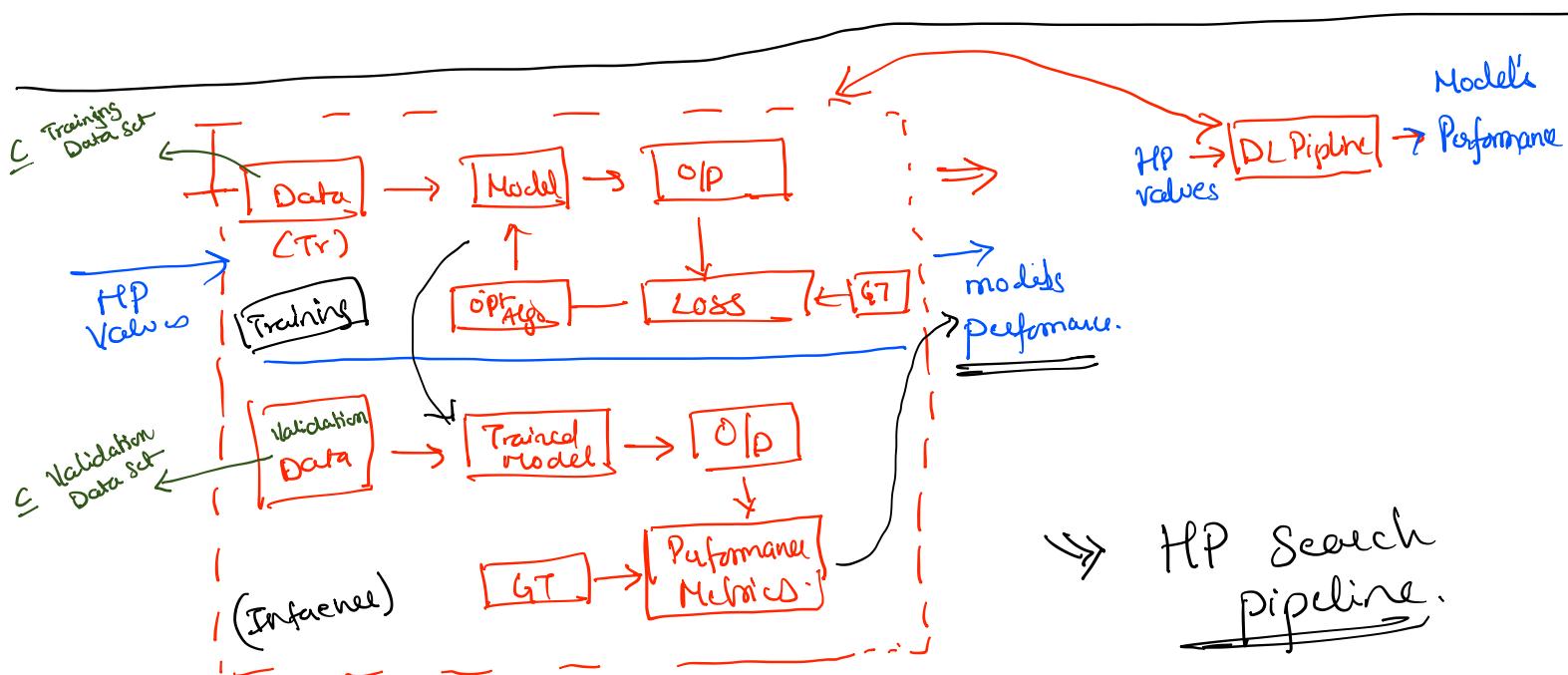
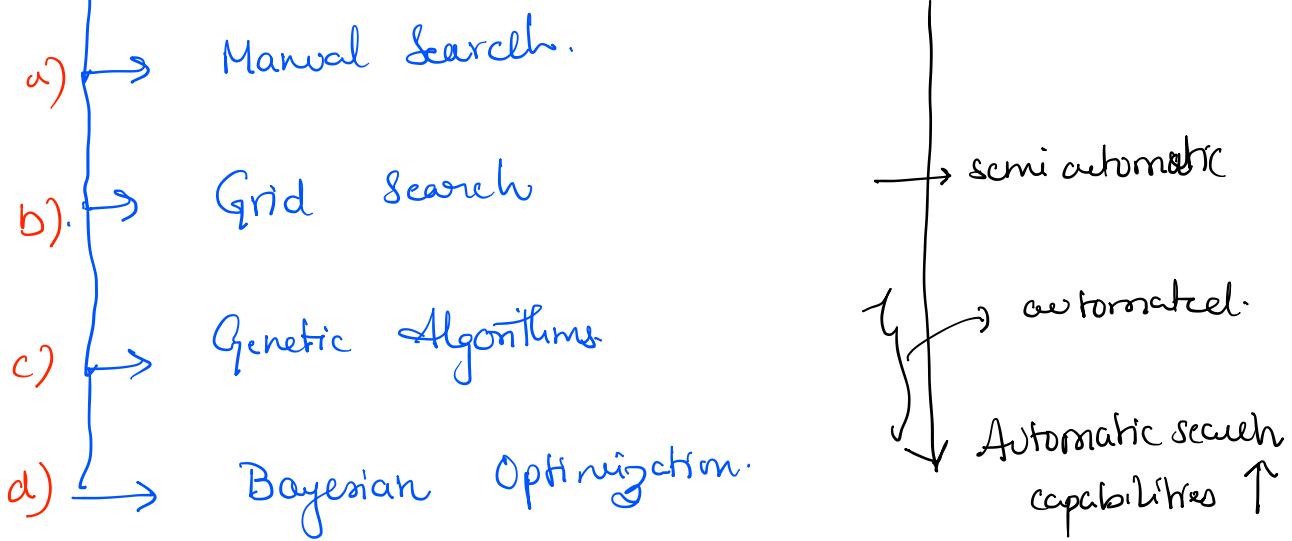
## Hyperparameter Optimization:

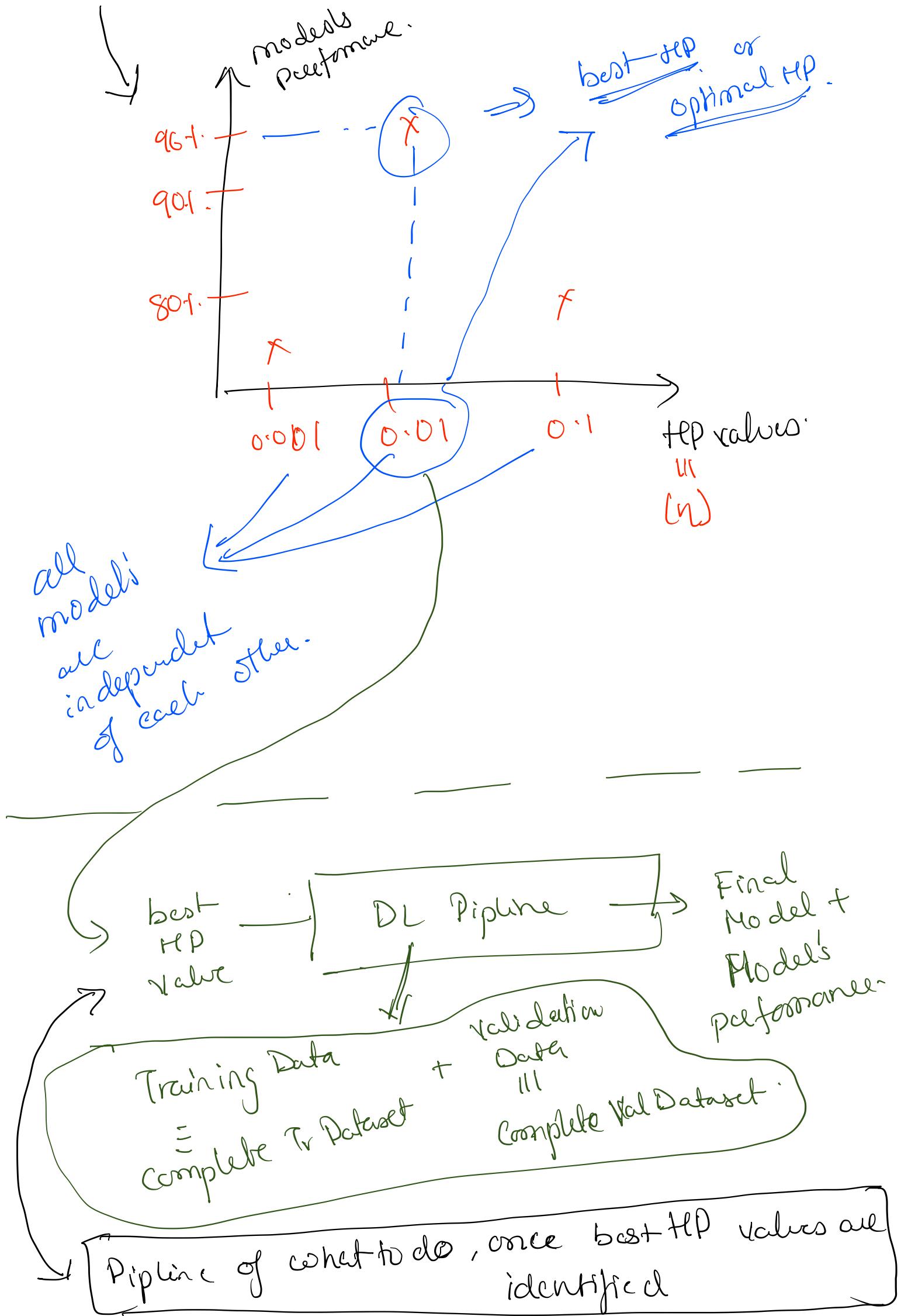
→ How do we select the best HPs?

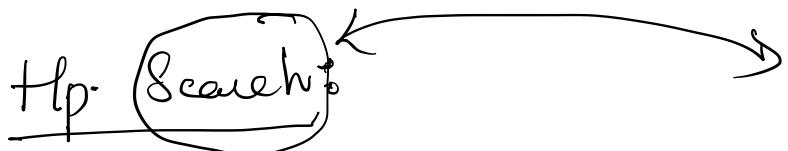
Say,  $LR(\eta) = \{0.1, 0.001, 0.003, 0.005\}$

which value of  $\eta$  is best / suitable  
for a task at hand?









Selecting next HP value to train and evaluate the model.



↳ How do we select the value  $n_2$  to get  $P_2$

→ Manual Search:

Selecting  $n_2^1 \rightarrow$  Manually



↳ Based on knowledge & intuition of user.

Repeats for # of HP values  
user wants to check.

Sequential.

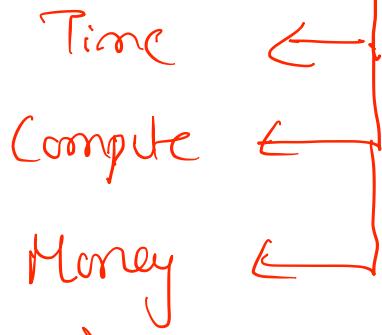
Based on human IP.

Not automatic.

Tiresome. & time consuming.

↳ # HP values to check depend on resources

available.



↳ Becomes difficult if  
searching  $\geq$  HPs.

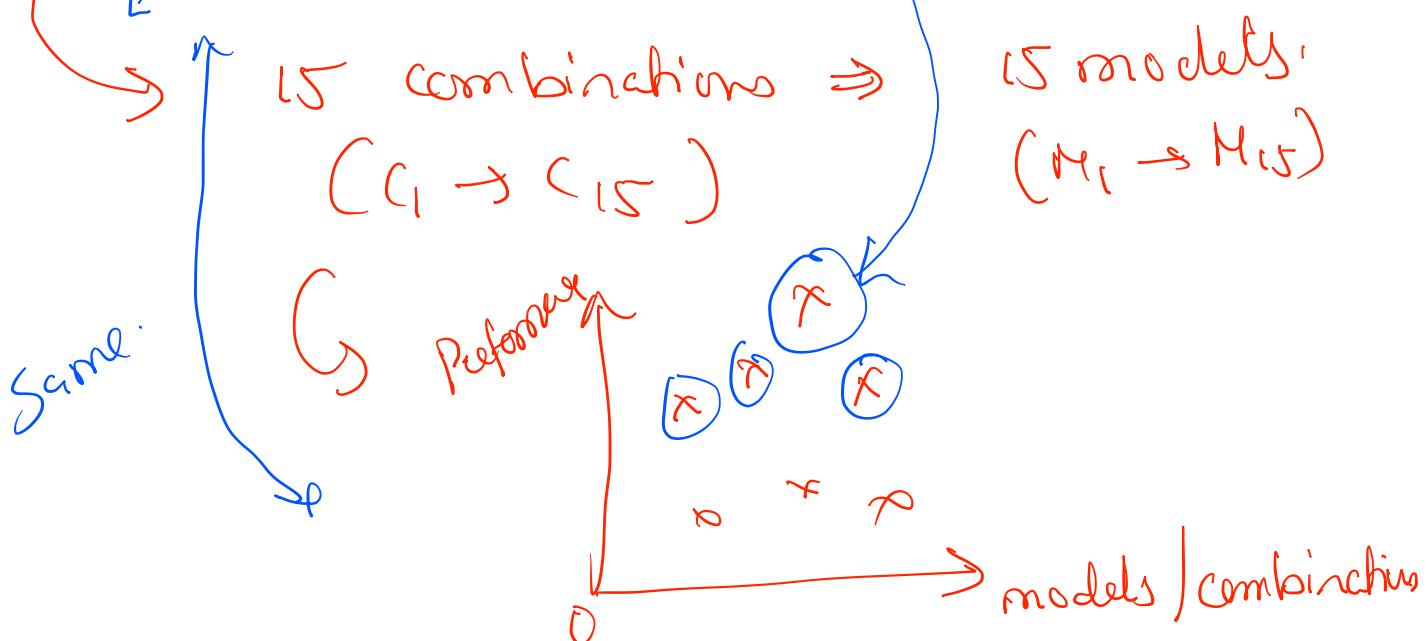
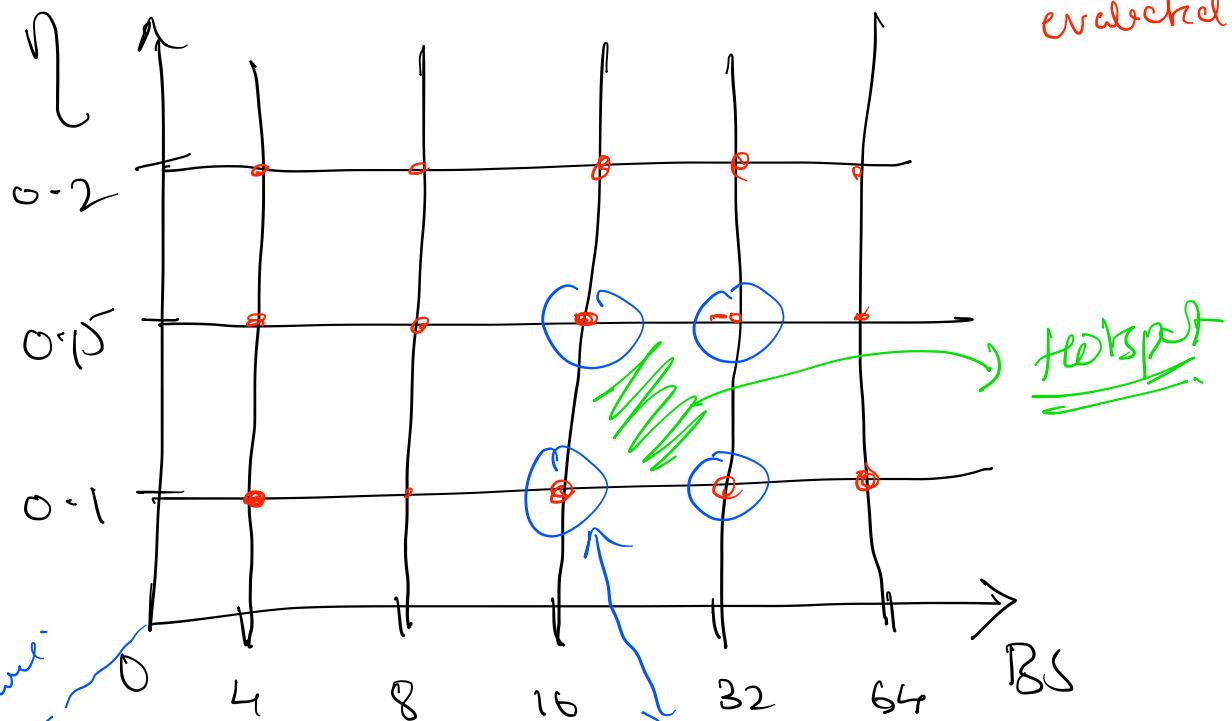
## → Grid Search:

↳ Semi-automatic.  $\{0.1, 0.15, 0.2\}$

Consider 2 HPs  $\rightarrow \eta = [0.1, 0.2]$ ; intervals of 0.05  
 $\rightarrow$  BS =  $\{4, 8, 16, 32, 64\}$   
(batchsize)

↳ Supports list of range of HPs.

Forms a grid of HPs  $\Rightarrow$  "HP Space".  
 Combinations of HPs to be trained & evaluated.



$\hookrightarrow$  All 15 models  $\Rightarrow$  trained & evaluated  
 "Parallelly".

↳ Human ip  $\Rightarrow$  limited to  
↳ selecting  
range &  
spacing of HP  
values  
(or)  
List of HP values

↳ Compute intensive compared to Manual  
Search.

↳ Grid can be modified after  
1<sup>st</sup> round evaluations ie after  
checking 15 models performance.

↳ update range and list  
to cover only the hotspot  
region.  
↳ New values / combining  
of HPs  $\Rightarrow$  New models  
↳ New best HP values.

Repeat until convergence  
of budget cost is achieved.