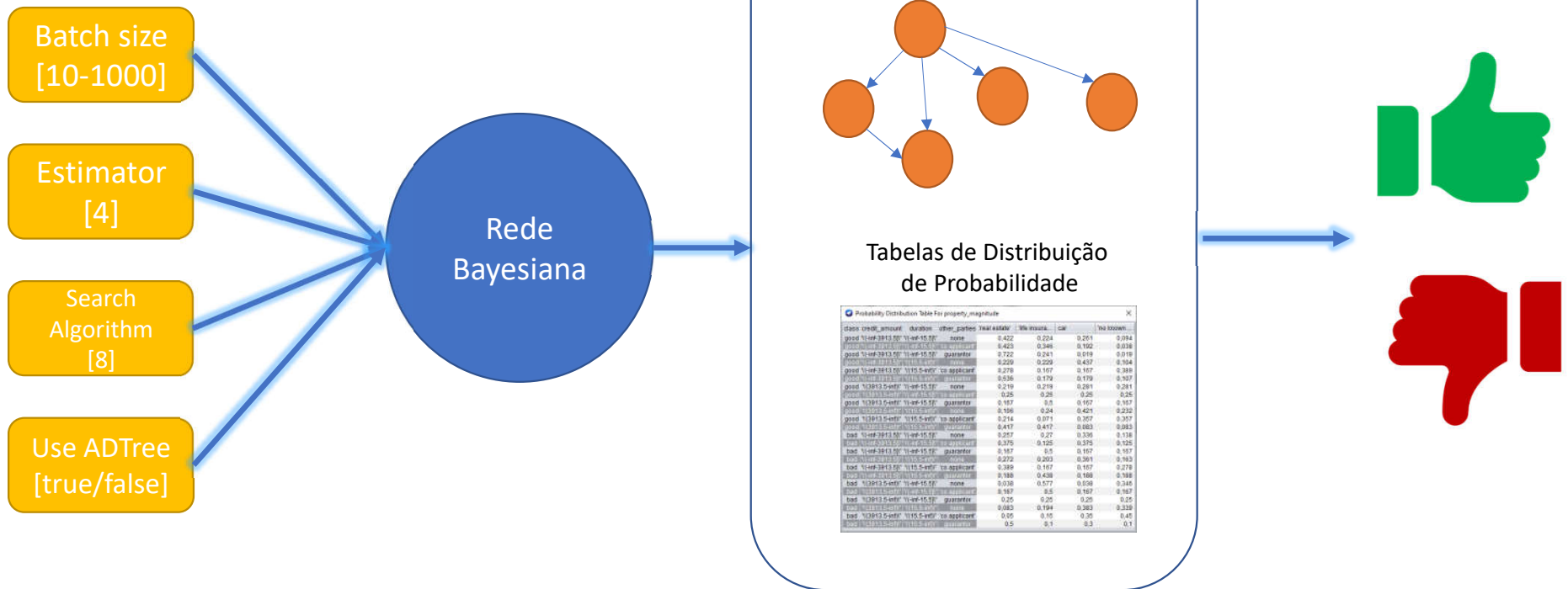
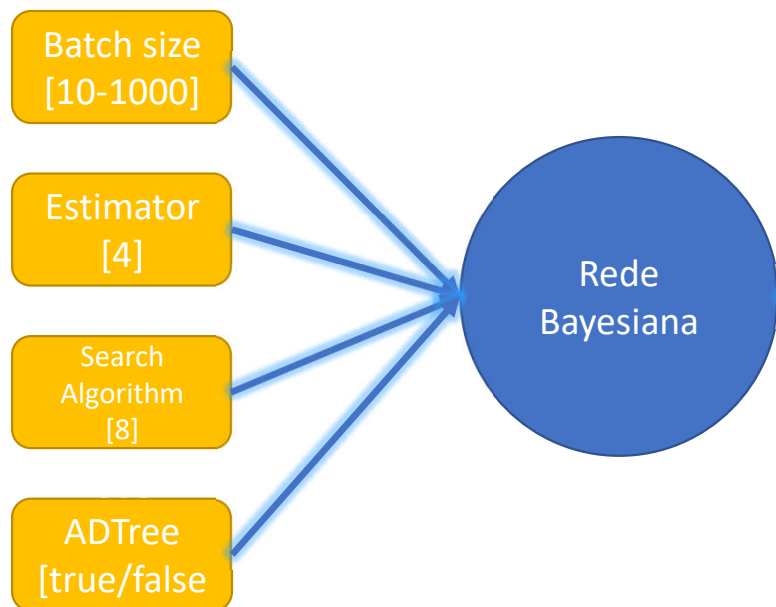


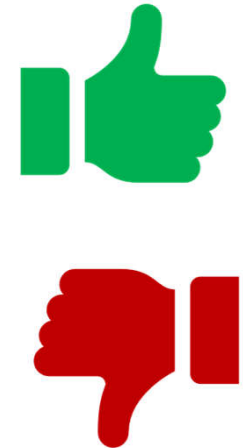
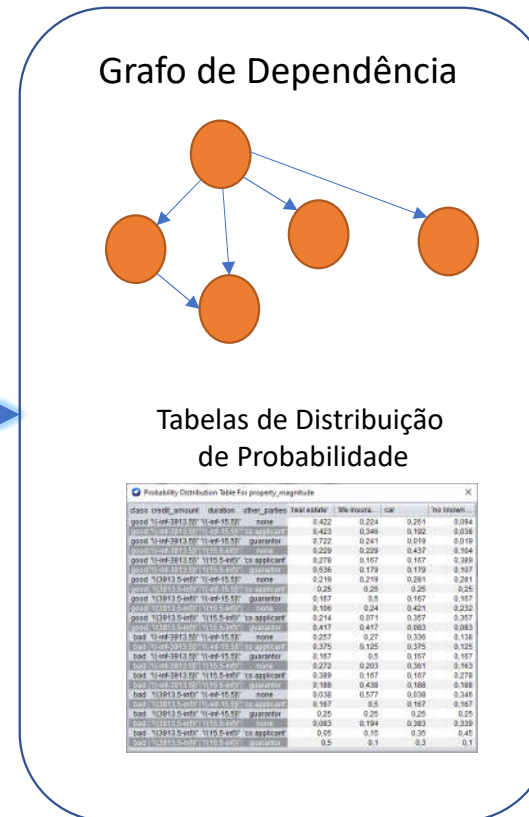
# Classificadores



## Hiper parâmetros



## Parâmetros



# Diferenças

**Hiper parâmetros** são normalmente configurados pelos implementadores do classificador, antes do processo de treino. Ex: Cientista de Dados

**Parâmetros** são configurados pelo algoritmo, durante o processo de treino

# Hiper Parâmetros

Hiper Parâmetros de  
Modelo: Interferem na  
performance do modelo

Hiper Parâmetros de  
Algoritmo: Não interfere  
na performance do  
modelo, mas do  
processo de aprendizado

# Domínio

- Inteiros: Epochs
- Valores Reais: Learning Rate
- Binários: Normalizar Atributos
- Categóricos: Estimador

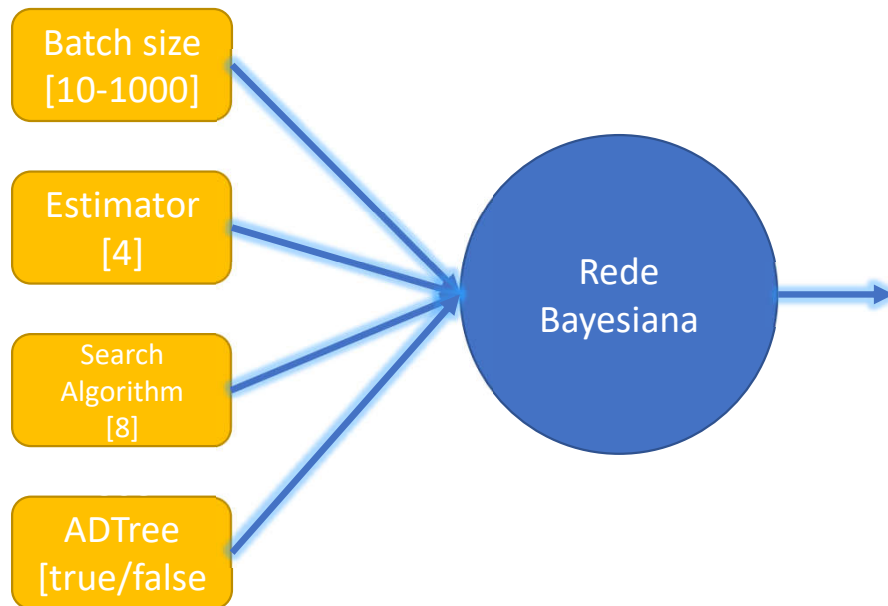
# Hiper parâmetros condicionais

- A escolha de um depende ou invalida outro
  - Um método de busca depende do avaliador de atributo

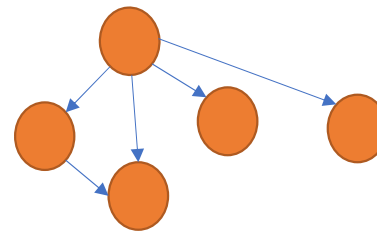


## Parâmetros

### Hiper parâmetros

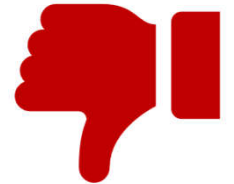


### Grafo de Dependência



### Tabelas de Distribuição de Probabilidade

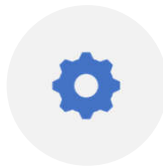
date_created	amount	duration	other_party	total_assets	Winnings	car	Yes/No
good '10-10-10'	10-10-10	none	0.422	0.204	0.261	0.094	
good '10-10-10'	10-10-10	quarter	0.422	0.204	0.261	0.094	
good '10-10-10'	10-10-10	quarter	0.222	0.241	0.019	0.019	
good '10-10-10'	10-10-10	quarter	0.229	0.229	0.437	0.104	
good '10-10-10'	10-10-10	quarter	0.270	0.167	0.167	0.280	
good '10-10-10'	10-10-10	quarter	0.536	0.179	0.179	0.167	
good '10-10-10'	10-10-10	quarter	0.219	0.219	0.281	0.281	
good '10-10-10'	10-10-10	quarter	0.25	0.25	0.25	0.25	
good '10-10-10'	10-10-10	quarter	0.167	0.5	0.167	0.167	
good '10-10-10'	10-10-10	quarter	0.156	0.24	0.421	0.232	
good '10-10-10'	10-10-10	quarter	0.214	0.071	0.357	0.357	
good '10-10-10'	10-10-10	quarter	0.417	0.417	0.083	0.083	
good '10-10-10'	10-10-10	quarter	0.257	0.27	0.336	0.138	
good '10-10-10'	10-10-10	quarter	0.375	0.125	0.375	0.125	
good '10-10-10'	10-10-10	quarter	0.167	0.5	0.167	0.167	
good '10-10-10'	10-10-10	quarter	0.272	0.203	0.391	0.163	
good '10-10-10'	10-10-10	quarter	0.389	0.167	0.167	0.278	
good '10-10-10'	10-10-10	quarter	0.188	0.438	0.168	0.188	
good '10-10-10'	10-10-10	quarter	0.038	0.577	0.038	0.038	
good '10-10-10'	10-10-10	quarter	0.167	0.5	0.167	0.167	
good '10-10-10'	10-10-10	quarter	0.25	0.25	0.25	0.25	
good '10-10-10'	10-10-10	quarter	0.083	0.194	0.083	0.083	
good '10-10-10'	10-10-10	quarter	0.25	0.15	0.25	0.45	
good '10-10-10'	10-10-10	quarter	0.5	0.1	0.3	0.1	



# Conclusão:



A definição correta dos hiperparâmetros é vital para a performance do modelo!



Mas quais valores para escolher para os hiperparâmetros?



E será que o classificador que eu estou usando é o melhor?



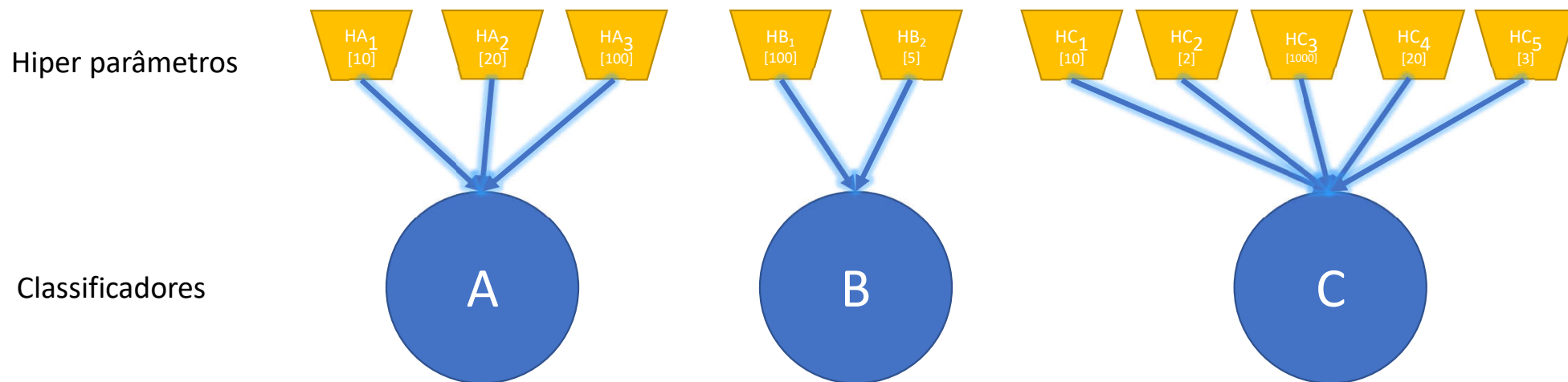
# Hiper Parâmetros

- Existem boas práticas, regras gerais, valores default
- Exemplo, para topologia de uma RNA:

$$t = \frac{a + c}{2}$$

- Porém:
  - O número de configurações é muito grande
  - O custo computacional é muito alto

# Usando mais Classificadores



Serão necessários 1.220.500 treinos diferentes para testar todas as opções  
 $(10*20*100)+(100*5)+(10*2*1000*20*3)$

Supondo que cada configuração de cada classificador leve 1 minuto para treino

## 2,3 Anos!



Auto ML

Não basta  
automatizar, é  
preciso buscar a  
melhor  
configuração de  
hiper parâmetros!