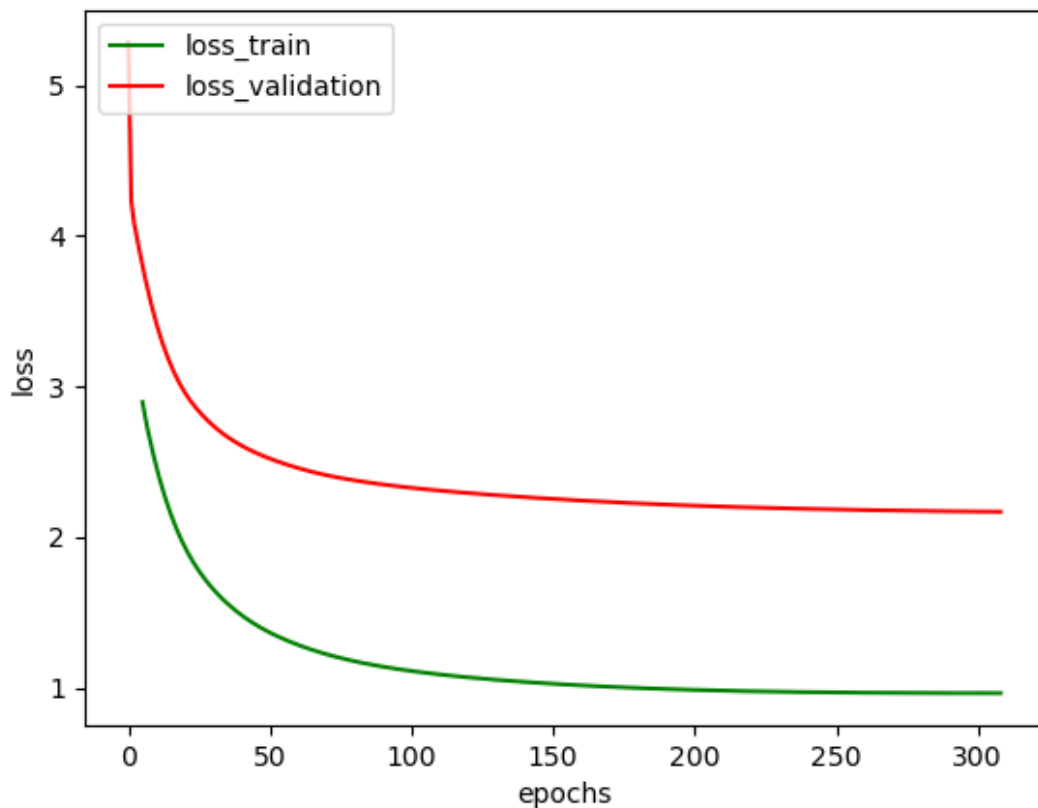
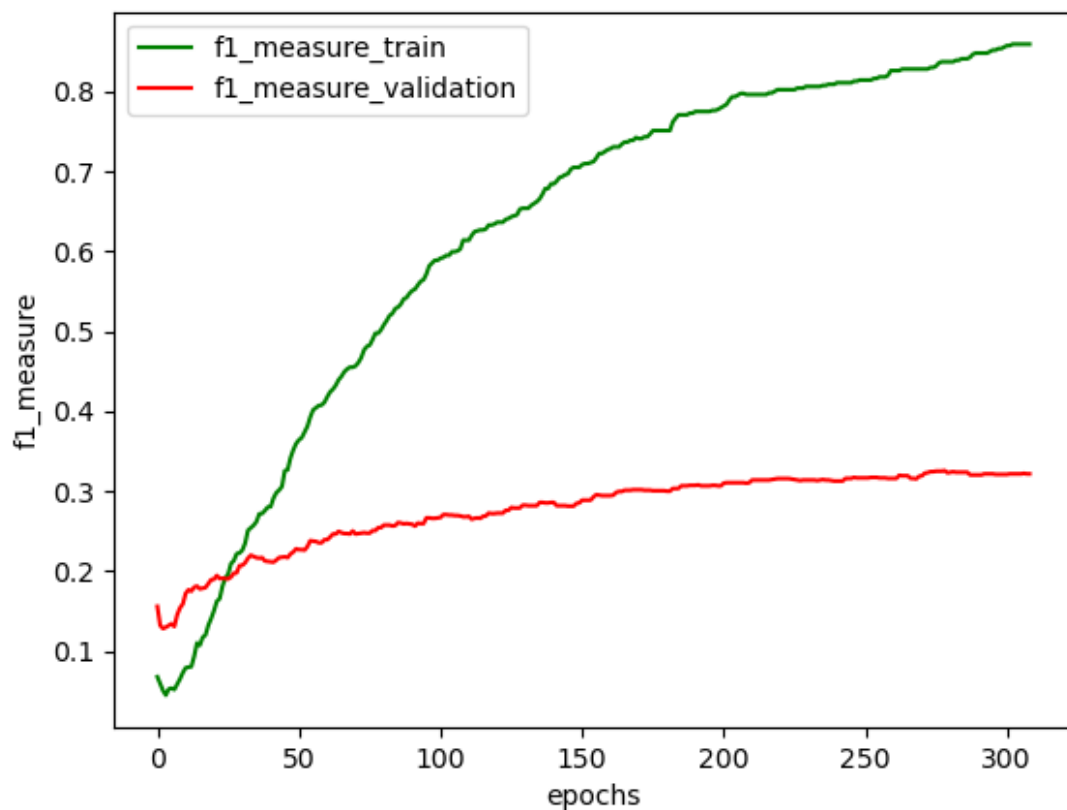


numpy手动求导：迭代次数截图和loss、f1 measure函数图形

```
epochs:305 loss:0.9656135916125214
train:
precision_ratio=0.9601449275362319 recall_ratio=0.7771260997067448 f1_measure=0.8589951377633711
validation:
precision_ratio=0.32142857142857145 recall_ratio=0.32142857142857145 f1_measure=0.32142857142857145
epochs:306 loss:0.9656089806468897
train:
precision_ratio=0.9601449275362319 recall_ratio=0.7771260997067448 f1_measure=0.8589951377633711
validation:
precision_ratio=0.32270916334661354 recall_ratio=0.32142857142857145 f1_measure=0.3220675944333996
epochs:307 loss:0.9656063952235796
train:
precision_ratio=0.9601449275362319 recall_ratio=0.7771260997067448 f1_measure=0.8589951377633711
validation:
precision_ratio=0.32142857142857145 recall_ratio=0.32142857142857145 f1_measure=0.32142857142857145
epochs:308 loss:0.9656058042270729
train:
precision_ratio=0.9601449275362319 recall_ratio=0.7771260997067448 f1_measure=0.8589951377633711
validation:
precision_ratio=0.32142857142857145 recall_ratio=0.32142857142857145 f1_measure=0.32142857142857145
迭代到第308次，结束迭代！
test:
precision_ratio=0.38144329896907214 recall_ratio=0.37 f1_measure=0.3756345177664974
test f1_measure:0.3756345177664974
```





torch自动求导：迭代次数截图和loss、f1 measure函数图形

```
epochs:997 loss:57.4250373840332
train:
precision_ratio=1.0 recall_ratio=0.9824046920821115 f1_measure=0.9911242603550295
validation:
precision_ratio=0.5892857142857143 recall_ratio=0.2619047619047619 f1_measure=0.3626373626373626
epochs:998 loss:57.348670959472656
train:
precision_ratio=1.0 recall_ratio=0.9824046920821115 f1_measure=0.9911242603550295
validation:
precision_ratio=0.5892857142857143 recall_ratio=0.2619047619047619 f1_measure=0.3626373626373626
epochs:999 loss:57.27241897583008
train:
precision_ratio=1.0 recall_ratio=0.9824046920821115 f1_measure=0.9911242603550295
validation:
precision_ratio=0.5892857142857143 recall_ratio=0.2619047619047619 f1_measure=0.3626373626373626
epochs:1000 loss:57.19632339477539
train:
precision_ratio=1.0 recall_ratio=0.9824046920821115 f1_measure=0.9911242603550295
validation:
precision_ratio=0.5892857142857143 recall_ratio=0.2619047619047619 f1_measure=0.3626373626373626
test:
precision_ratio=0.5945945945945946 recall_ratio=0.22 f1_measure=0.32116788321167883
```

