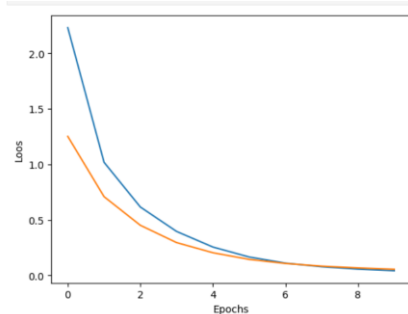
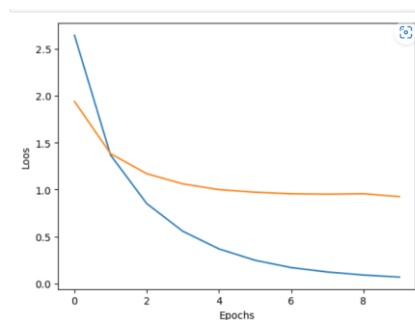


1. Перегрузила датасет, чтобы данные с train не дублировались в val и test
2. Точность значительно снизилась



ДО

```
Accuracy of abraham_grampa_simpson : 99 %
Accuracy of agnes_skinner : 80 %
Accuracy of apu_nahasapeemapetilon : 99 %
Accuracy of barney_gumble : 83 %
Accuracy of bart_simpson : 100 %
Accuracy of carl_carlson : 100 %
Accuracy of charles_montgomery_burns : 98 %
Accuracy of chief_wiggum : 98 %
Accuracy of cletus_spuckler : 100 %
Accuracy of comic_book_guy : 96 %
Accuracy of disco_stu : 50 %
Accuracy of edna_krabappel : 98 %
Accuracy of fat_tony : 100 %
Accuracy of gil : 100 %
Accuracy of groundskeeper_willie : 100 %
Accuracy of homer_simpson : 98 %
Accuracy of kent_brockman : 100 %
Accuracy of krusty_the_clown : 99 %
Accuracy of lenny_leonard : 97 %
Accuracy of lionel_hutz : 0 %
Accuracy of lisa_simpson : 99 %
Accuracy of maggie_simpson : 85 %
Accuracy of marge_simpson : 98 %
Accuracy of martin_prince : 87 %
Accuracy of mayor_quimby : 98 %
Accuracy of milhouse_van_houten : 98 %
Accuracy of miss_hoover : 100 %
Accuracy of moe_szyslak : 98 %
Accuracy of ned_flanders : 98 %
Accuracy of nelson_muntz : 97 %
Accuracy of otto_mann : 75 %
Accuracy of patty_bouvier : 100 %
Accuracy of principal_skinner : 99 %
Accuracy of professor_john_frink : 85 %
Accuracy of rainier_wolfcastle : 100 %
Accuracy of ralph_wiggum : 100 %
Accuracy of selma_bouvier : 100 %
Accuracy of sideshow_bob : 100 %
Accuracy of sideshow_mel : 100 %
Accuracy of snake_jailbird : 83 %
Accuracy of troy_mcclure : 50 %
Accuracy of waylon_smithers : 89 %
```



ПОСЛЕ

```
Accuracy of abraham_grampa_simpson : 76 %
Accuracy of agnes_skinner : 0 %
Accuracy of apu_nahasapeemapetilon : 78 %
Accuracy of barney_gumble : 31 %
Accuracy of bart_simpson : 82 %
Accuracy of carl_carlson : 71 %
Accuracy of charles_montgomery_burns : 74 %
Accuracy of chief_wiggum : 85 %
Accuracy of cletus_spuckler : 50 %
Accuracy of comic_book_guy : 67 %
Accuracy of disco_stu : 0 %
Accuracy of edna_krabappel : 72 %
Accuracy of fat_tony : 0 %
Accuracy of gil : 0 %
Accuracy of groundskeeper_willie : 56 %
Accuracy of homer_simpson : 80 %
Accuracy of kent_brockman : 84 %
Accuracy of krusty_the_clown : 88 %
Accuracy of lenny_leonard : 72 %
Accuracy of lionel_hutz : 0 %
Accuracy of lisa_simpson : 83 %
Accuracy of maggie_simpson : 7 %
Accuracy of marge_simpson : 89 %
Accuracy of martin_prince : 20 %
Accuracy of mayor_quimby : 62 %
Accuracy of milhouse_van_houten : 79 %
Accuracy of miss_hoover : 0 %
Accuracy of moe_szyslak : 78 %
Accuracy of ned_flanders : 83 %
Accuracy of nelson_muntz : 53 %
Accuracy of otto_mann : 14 %
Accuracy of patty_bouvier : 66 %
Accuracy of principal_skinner : 82 %
Accuracy of professor_john_frink : 23 %
Accuracy of rainier_wolfcastle : 22 %
Accuracy of ralph_wiggum : 15 %
Accuracy of selma_bouvier : 68 %
Accuracy of sideshow_bob : 89 %
Accuracy of sideshow_mel : 12 %
Accuracy of snake_jailbird : 9 %
Accuracy of troy_mcclure : 0 %
Accuracy of waylon_smithers : 43 %
```

3. Использовала аугментацию, чтобы забалансировать датасет, а именно часть train
- Примеры:



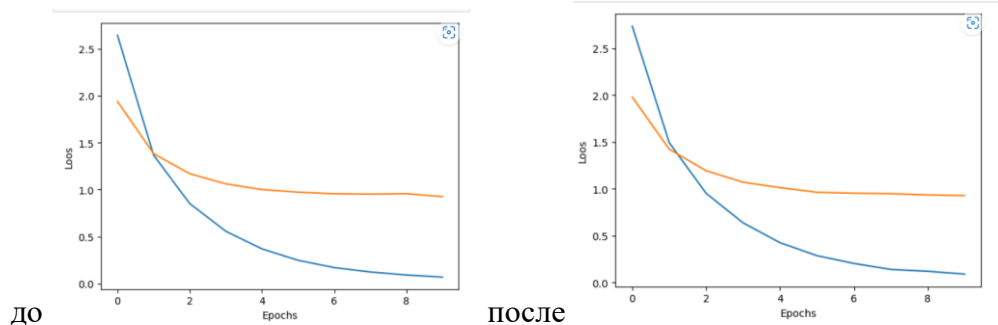
Код для аугментации:

```
import Augmentor

p = Augmentor.Pipeline("Lab1/data/val/sideshow_mel")

p.flip_left_right(0.5)
p.rotate(0.3, 10, 10)
p.skew(0.4, 0.5)
p.random_distortion(probability=1, grid_width=64, grid_height=64, magnitude=8)
p.zoom(probability = 0.2, min_factor = 1.1, max_factor = 1.5)
p.sample(25)
```

4. Снова школа:



```

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Accuracy of sideshow_mel : 12 %
Accuracy of snake_jailbird : 9 %
Accuracy of troy_mcclure : 0 %
Accuracy of waylon_smithers : 43 %

```

```

Accuracy of abraham_grampa_simpson : 72 %
Accuracy of agnes_skinner : 22 %
Accuracy of apu_nahasapeemapetilon : 81 %
Accuracy of barney_gumble : 36 %
Accuracy of bart_simpson : 84 %
Accuracy of carl_carlson : 57 %
Accuracy of charles_montgomery_burns : 73 %
Accuracy of chief_wiggum : 85 %
Accuracy of cletus_spuckler : 30 %
Accuracy of comic_book_guy : 68 %
Accuracy of disco_stu : 0 %
Accuracy of edna_krabappel : 71 %
Accuracy of fat_tony : 16 %
Accuracy of gil : 33 %
Accuracy of groundskeeper_willie : 56 %
Accuracy of homer_simpson : 78 %
Accuracy of kent_brockman : 82 %
Accuracy of krusty_the_clown : 84 %
Accuracy of lenny_leonard : 70 %
Accuracy of lionel_hutz : 0 %
Accuracy of lisa_simpson : 83 %
Accuracy of maggie_simpson : 22 %
Accuracy of marge_simpson : 89 %
Accuracy of martin_prince : 20 %
Accuracy of mayor_quimby : 54 %
Accuracy of milhouse_van_houten : 79 %
Accuracy of miss_hoover : 0 %
Accuracy of moe_szyslak : 82 %
Accuracy of ned_flanders : 83 %
Accuracy of nelson_muntz : 58 %
Accuracy of otto_mann : 57 %
Accuracy of patty_bouvier : 66 %
Accuracy of principal_skinner : 80 %
Accuracy of professor_john_frink : 0 %
Accuracy of rainier_wolfcastle : 33 %
Accuracy of ralph_wiggum : 21 %
Accuracy of selma_bouvier : 72 %
Accuracy of sideshow_bob : 92 %
Accuracy of sideshow_mel : 37 %
Accuracy of snake_jailbird : 45 %
Accuracy of troy_mcclure : 66 %
Accuracy of waylon_smithers : 45 %

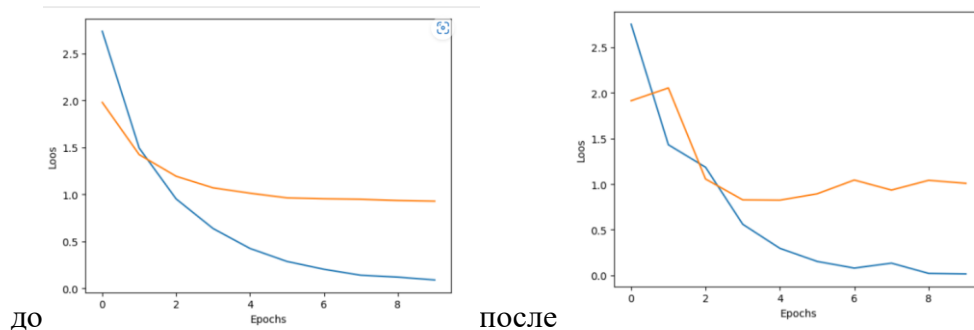
```

- Добавила метрику f1 – среднее между precision и recall, тк нам одинаково важно сколько модель нашла неправильных и не нашла правильных..... В общем, прощаем ошибки первого и второго рода в равно мере.
- Нормализация картинки. Нормализация помогает получить данные в пределах диапазона и уменьшает асимметрию, что помогает учиться быстрее и лучше. Нормализация также может решить проблемы уменьшающихся и взрывающихся градиентов. По формуле можно вычислить наиболее подходящие числа для нормализации

$$\text{output[channel]} = (\text{input[channel]} - \text{mean[channel]}) / \text{std[channel]}$$

Стремимся к тому, чтобы среднее входных данных было равно нулю, а стандартное отклонение – единице

7. Посчитала эти цифры с помощью какой-то левой функции из интернета. Всё стало очень странно, но результат улучшился



```

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```

```

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Accuracy of charles_montgomery_burns : 76 %
Accuracy of chief_wiggum : 91 %
Accuracy of cletus_spuckler : 60 %
Accuracy of comic_book_guy : 75 %
Accuracy of disco_stu : 0 %
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Accuracy of fat_tony : 66 %
Accuracy of gil : 33 %
Accuracy of groundskeeper_willie : 76 %
Accuracy of homer_simpson : 86 %
Accuracy of kent_brockman : 89 %
Accuracy of krusty_the_clown : 89 %
Accuracy of lenny_leonard : 77 %
Accuracy of lionel_hutz : 50 %
Accuracy of lisa_simpson : 86 %
Accuracy of maggie_simpson : 44 %
Accuracy of marge_simpson : 91 %
Accuracy of martin_prince : 40 %
Accuracy of mayor_quimby : 64 %
Accuracy of milhouse_van_houten : 84 %
Accuracy of miss_hoover : 0 %
Accuracy of moe_szyslak : 85 %
Accuracy of ned_flanders : 89 %
Accuracy of nelson_muntz : 65 %
Accuracy of otto_mann : 42 %
Accuracy of patty_bouvier : 80 %
Accuracy of principal_skinner : 87 %
Accuracy of professor_john_frink : 46 %
Accuracy of rainier_wolfcastle : 44 %
Accuracy of ralph_wiggum : 42 %
Accuracy of selma_bouvier : 77 %
Accuracy of sideshow_bob : 92 %
Accuracy of sideshow_mel : 37 %
Accuracy of snake_jailbird : 45 %
Accuracy of troy_mcclure : 100 %
Accuracy of waylon_smithers : 72 %

```

8. with torch.no_grad()

Отключение вычисления градиента полезно для логического вывода, когда вы уверены, что не будете вызывать [Tensor.backward\(\)](#). Это уменьшит потребление памяти для вычислений

requires_grad=True для вычисления градиента дефолт true

requires_grad=False экономит память время и ваши нервы