

Университет ИТМО

Факультет программной инженерии и компьютерной техники

Лабораторная работа №4

по «Системам искусственного интеллекта»

Выполнил:

Студент группы: Р33121

Нуруллаев Даниил

Преподаватели:

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Бессмертный И.А.

Санкт-Петербург

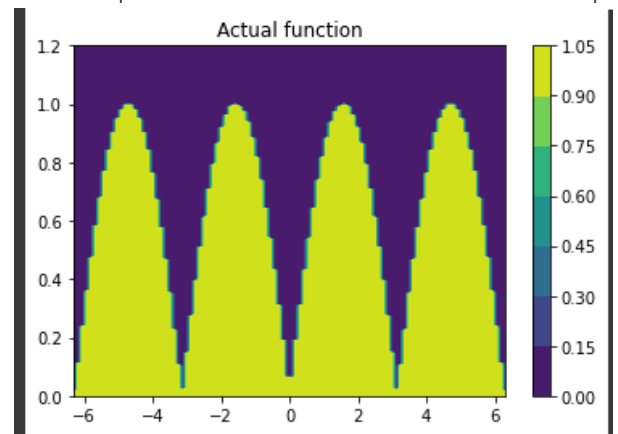
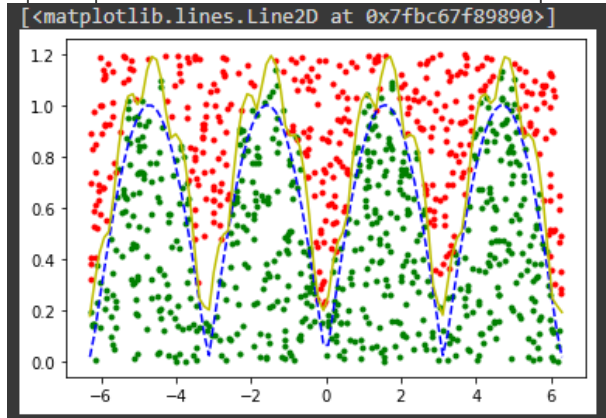
2022

1. Задание

Изменяя гиперпараметры, попытайтесь достичь максимального значения точности (не менее 0,95).

2. Вариант

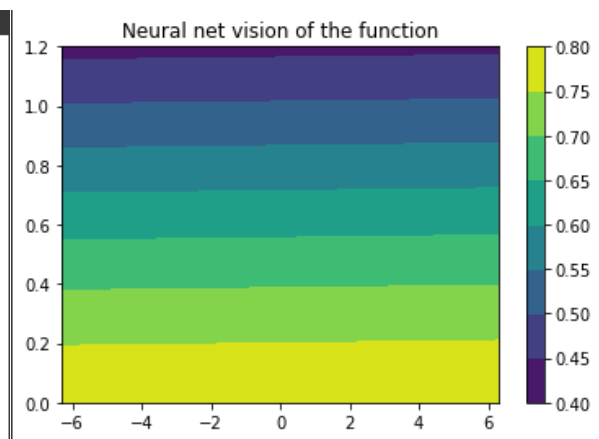
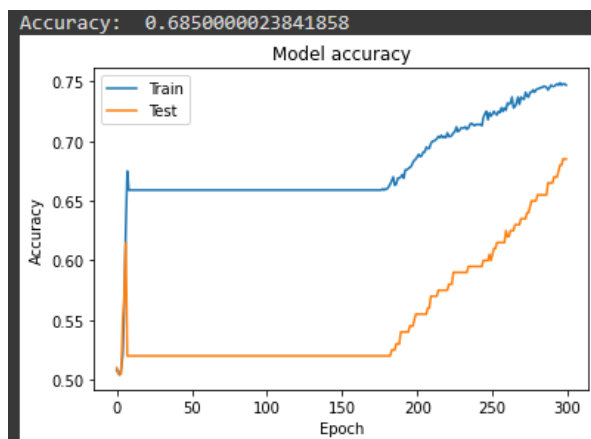
Var	Part1 func	Part2 data	Hyperparameters
1	Absolute(Sin(x)) X: 6,3..6.3 Y: 0..1.2	CIFAR10	Layers count, neurons count per layer



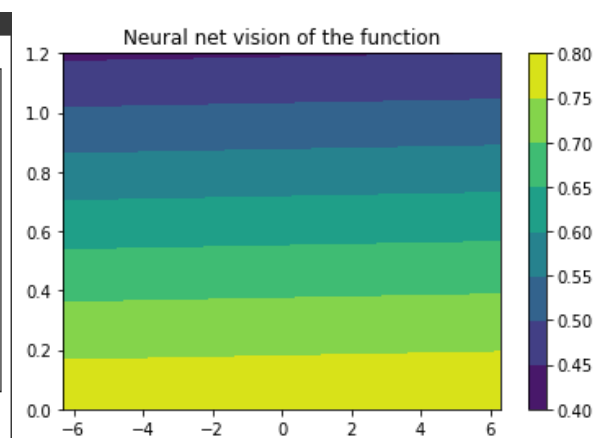
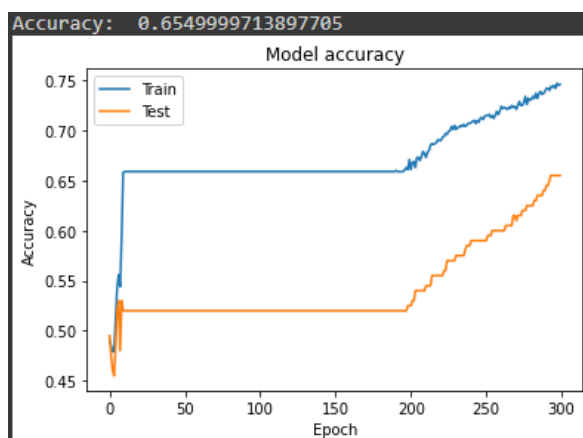
3. Part 1

Layers count : 0

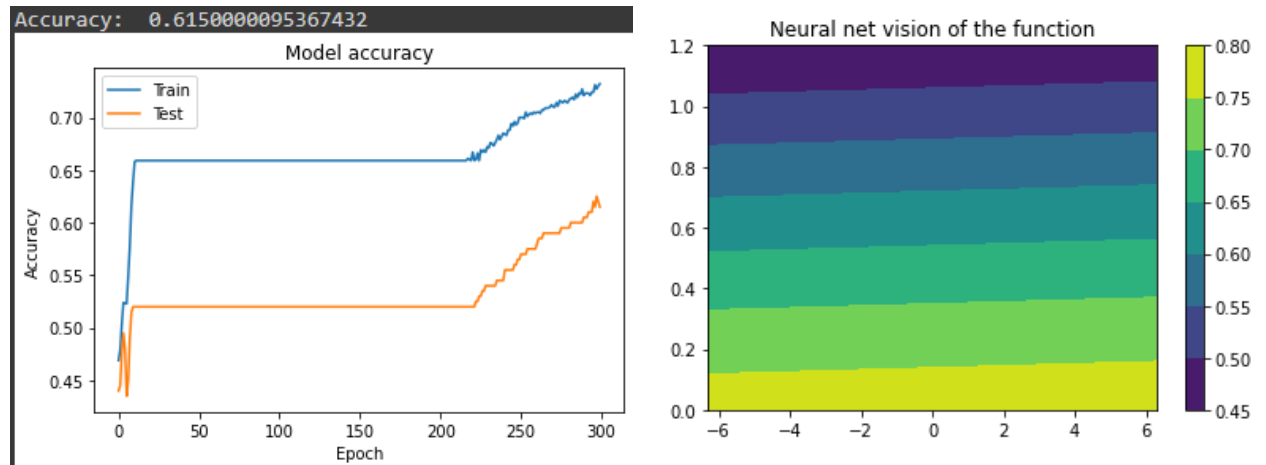
1) Neuronus count in layer: 0



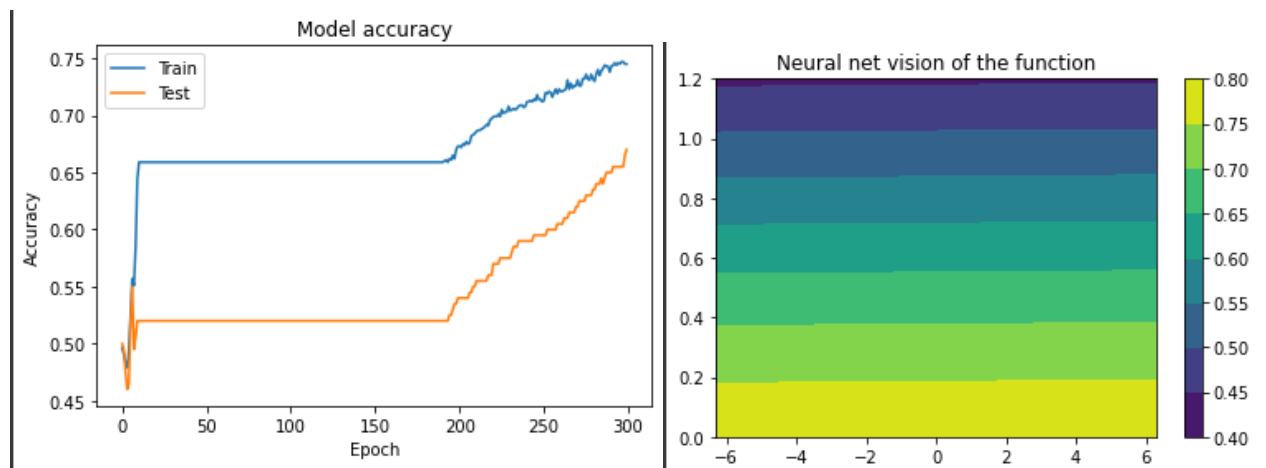
2) Neuronus count in layer: 5



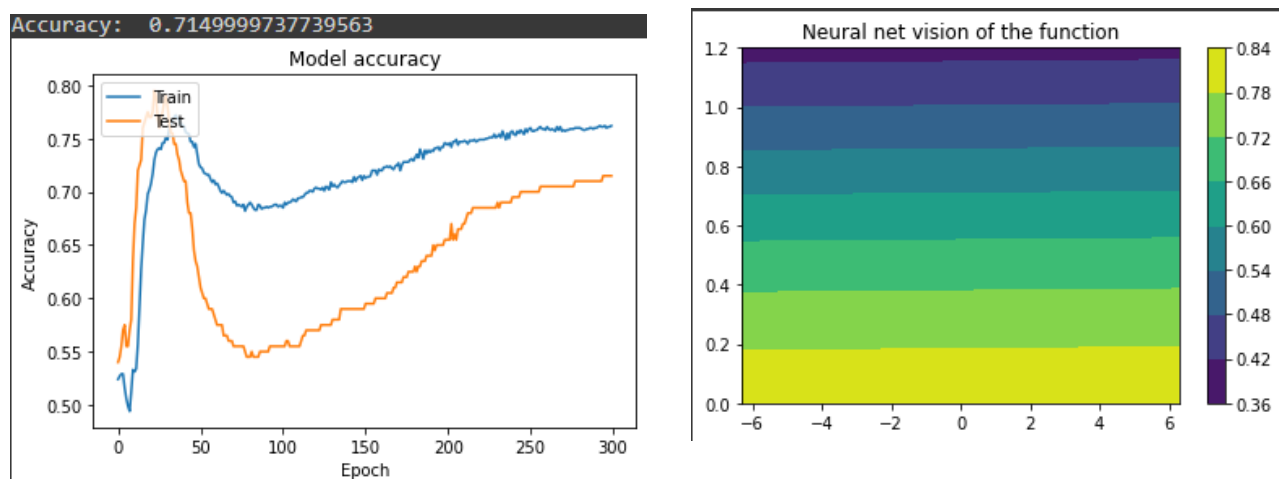
3) Neuronus count in layer: 10



4) Neuronus count in layer: 15

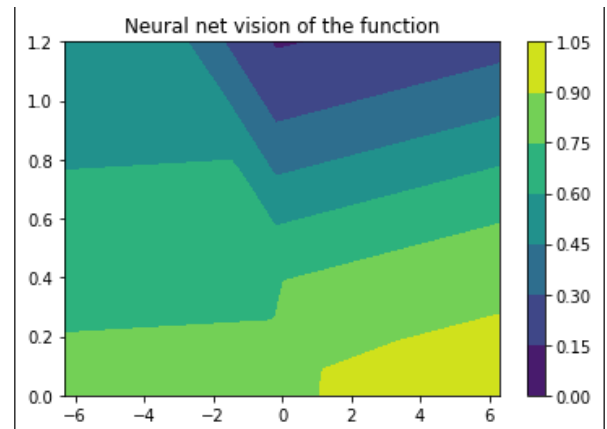
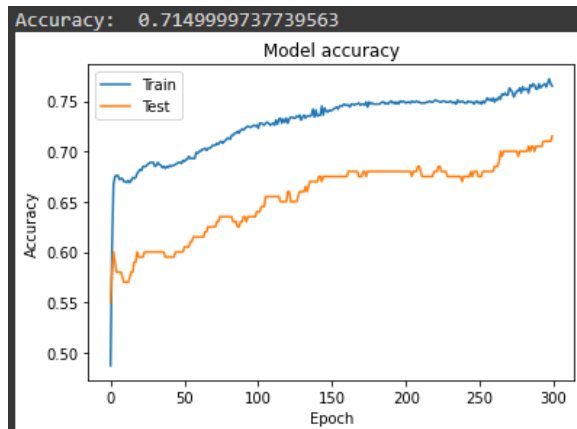


5) Neuronus count in layer: 20

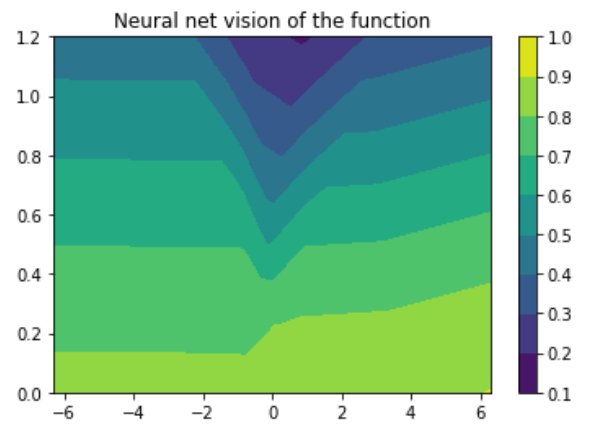
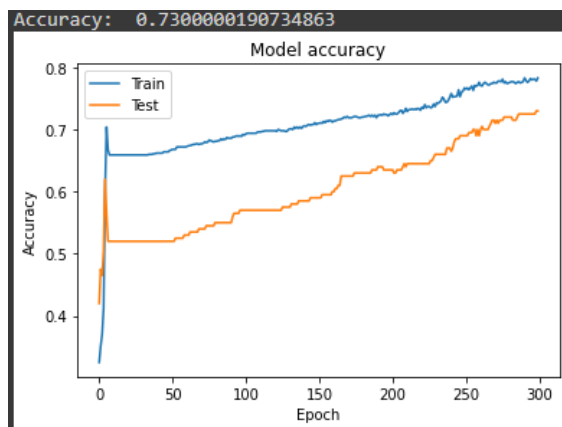


Layers count : 1

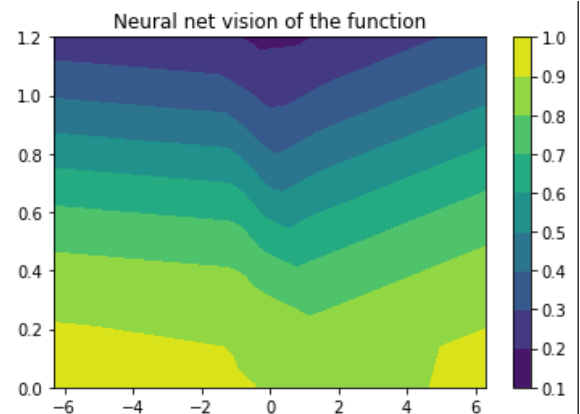
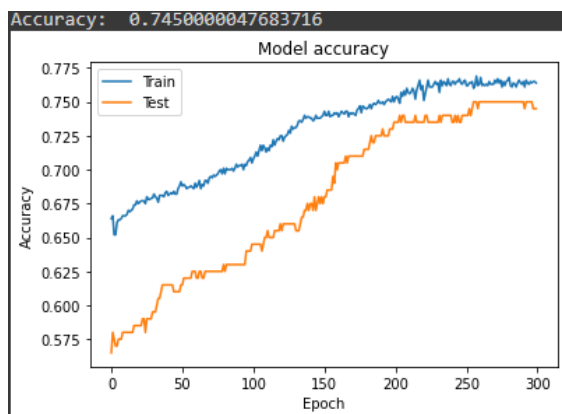
1) Neuronus count in layer: 5



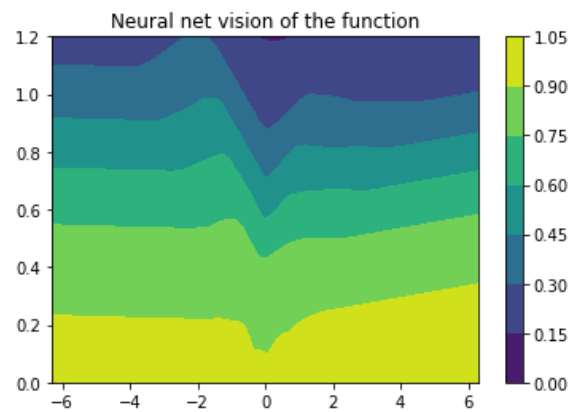
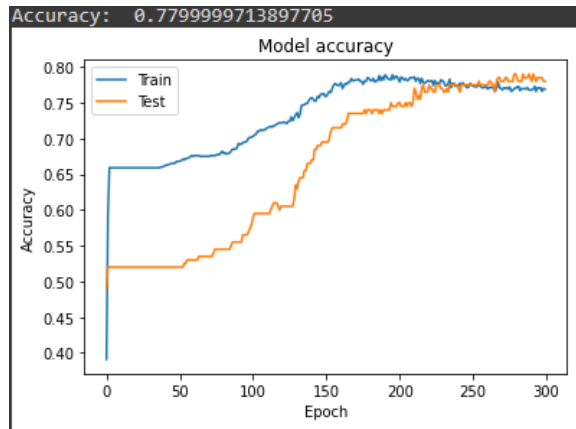
2) Neuronus count in layer: 10



3) Neuronus count in layer: 15

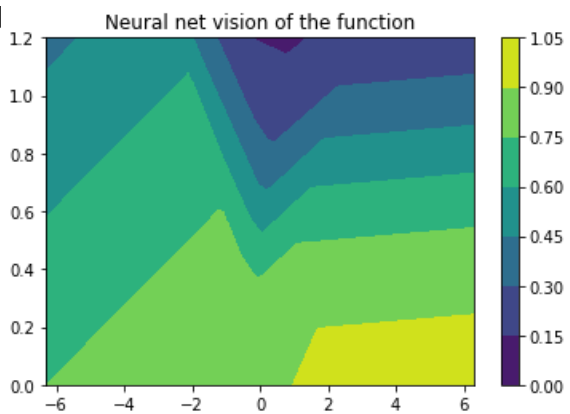
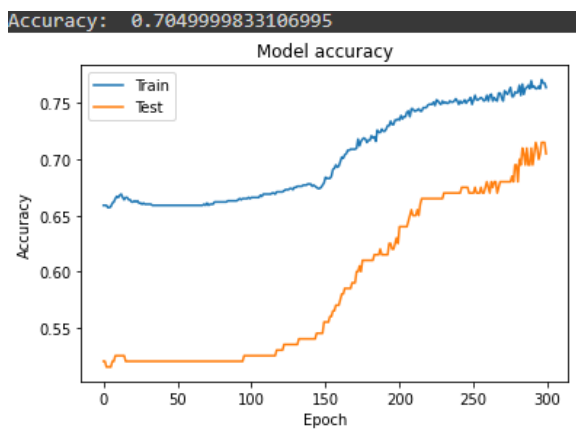


4)Neuronus count in layer: 20

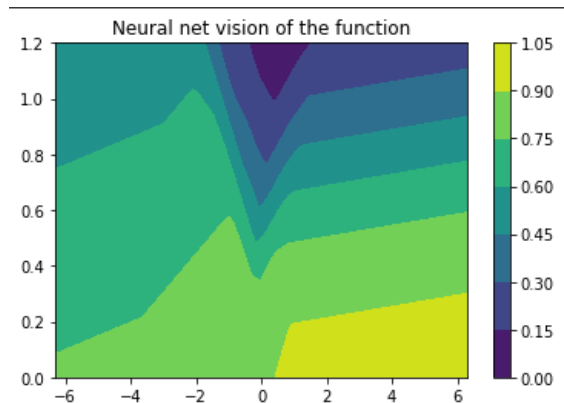
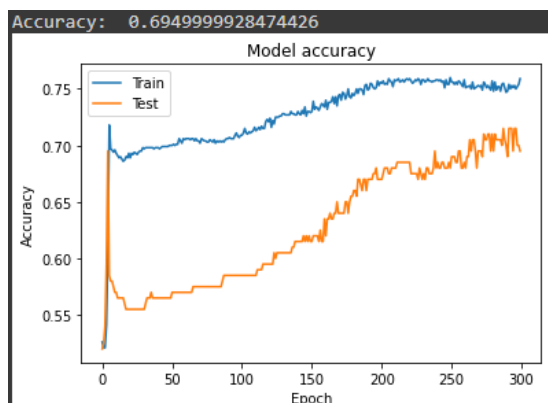


Layers count: 2

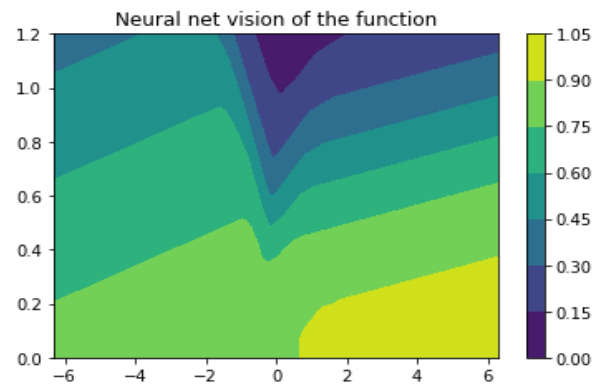
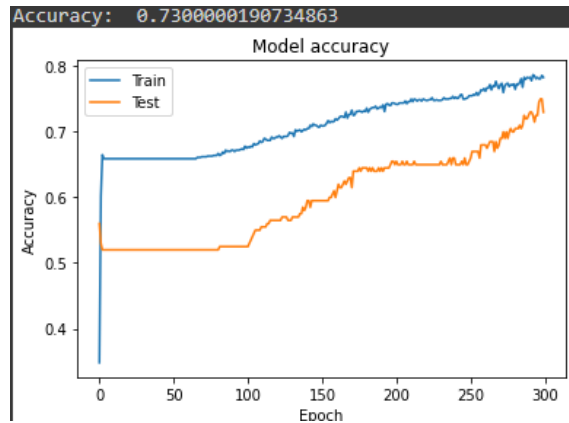
1)Neuronus count in layer: 5



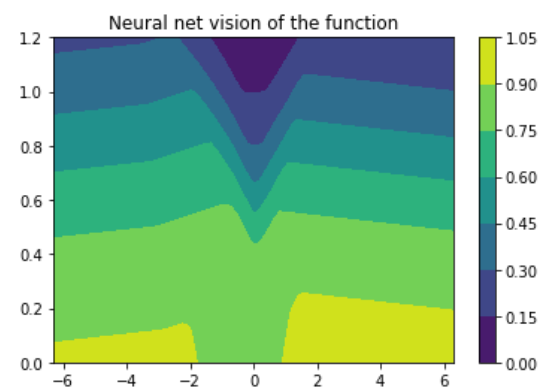
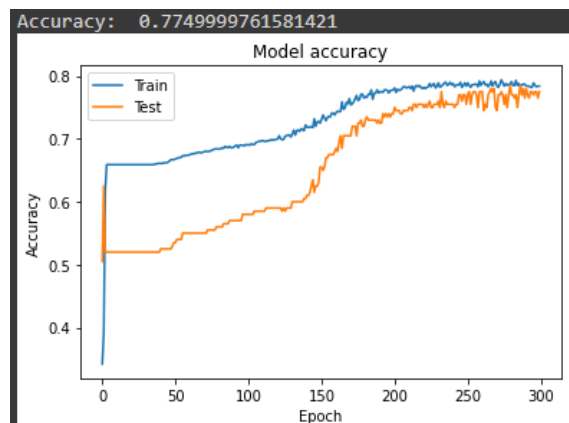
2)Neuronus count in layer: 10



3)Neuronus count in layer: 15

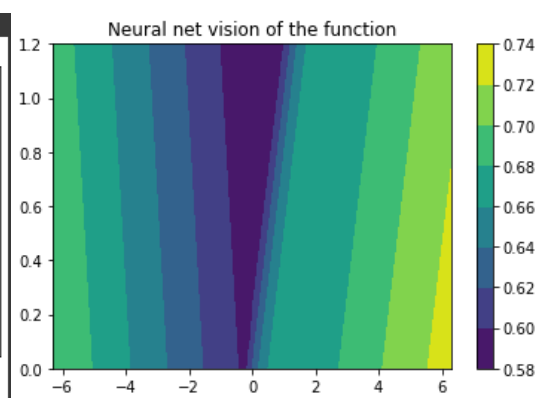
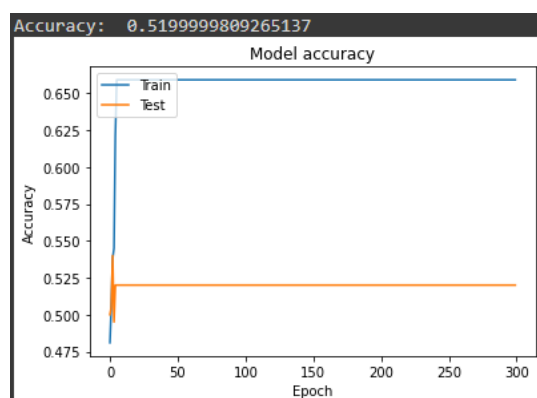


4)Neuronus count in layer: 20

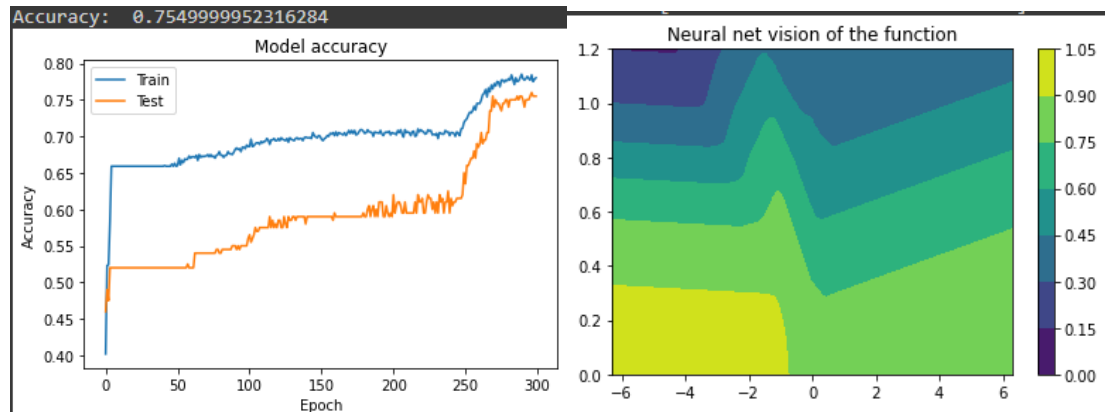


Layers count: 3

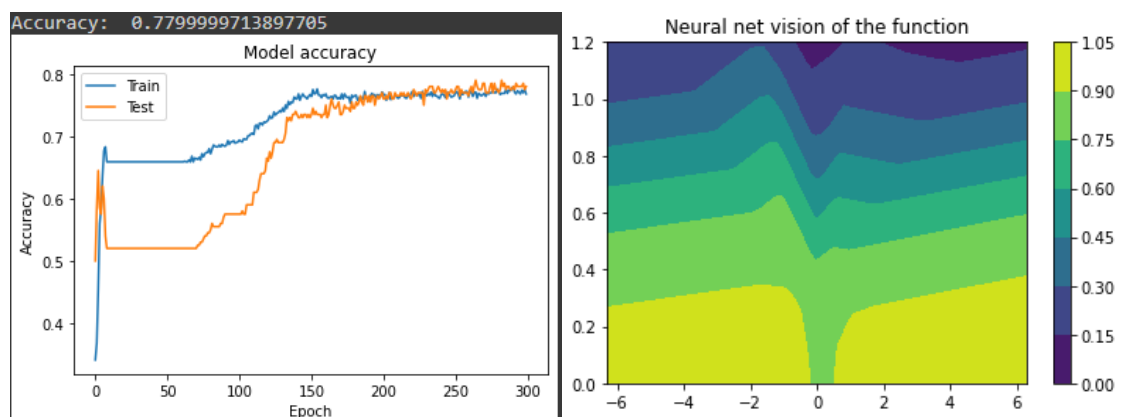
1)Neuronus count in layer: 5



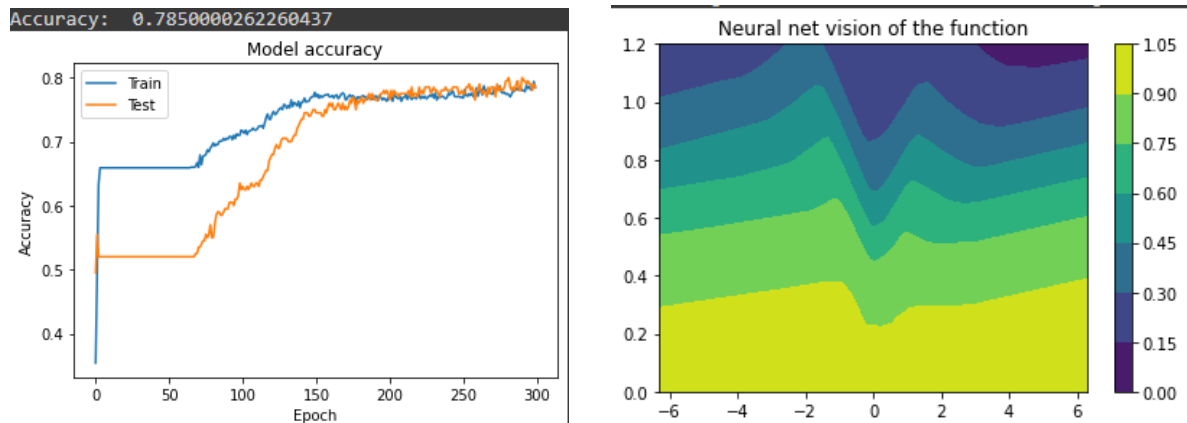
2)Neuronus count in layer: 10



3)Neuronus count in layer: 15

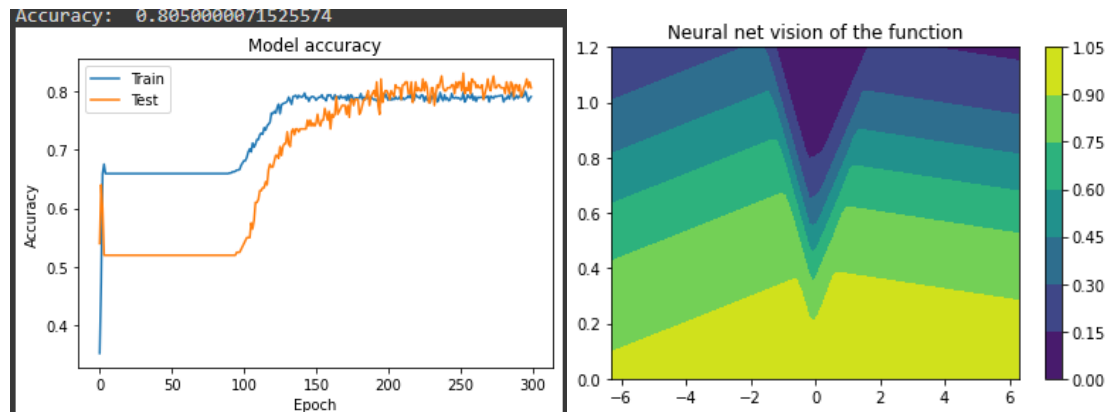


4)Neuronus count in layer: 20

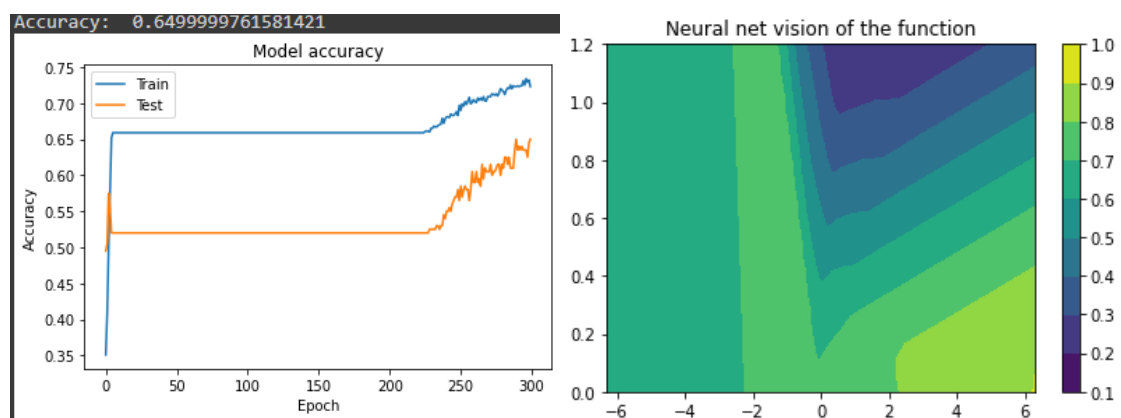


Layers count: 4

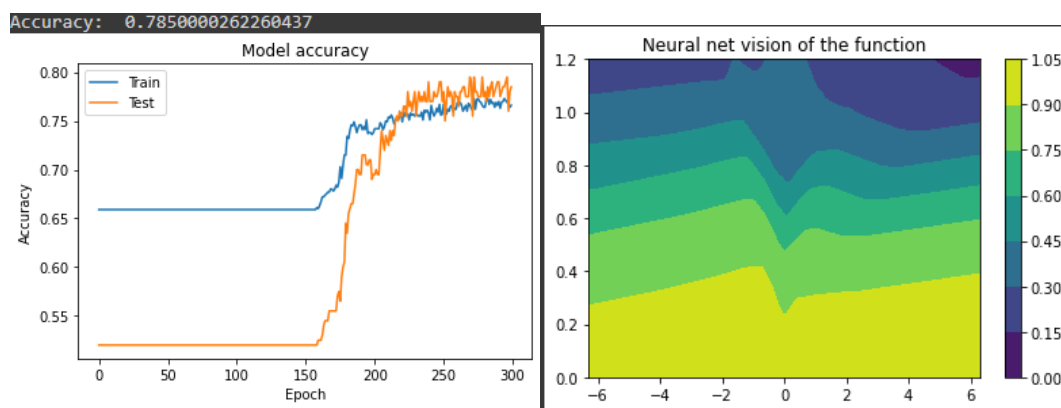
1)Neuronus count in layer: 5



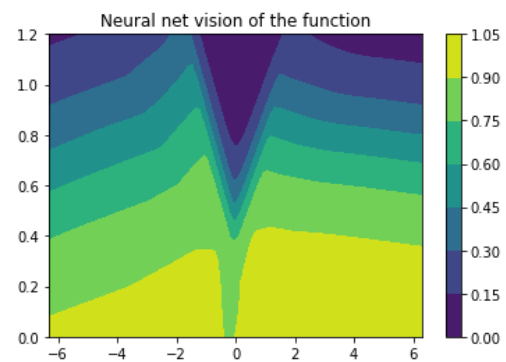
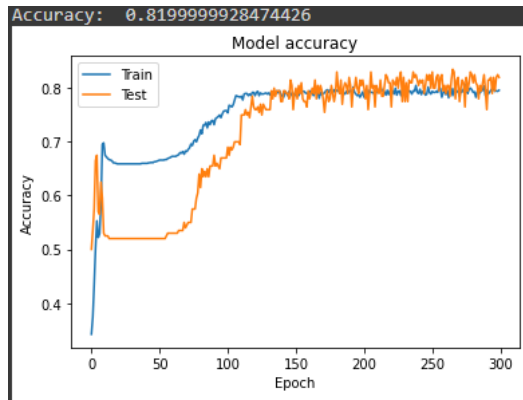
2)Neuronus count in layer: 10



3)Neuronus count in layer: 15



4)Neuronus count in layer: 20



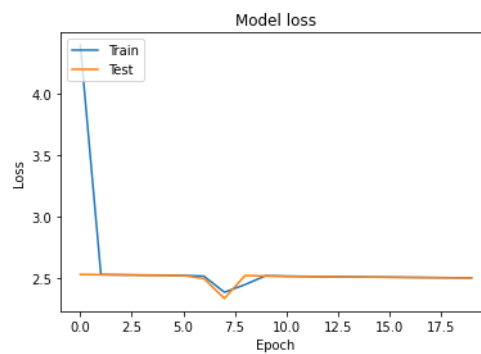
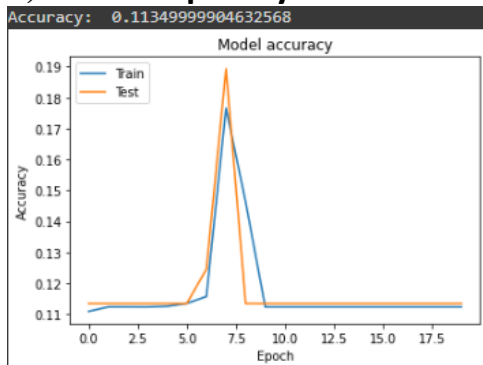
Самым точным оказалось Layers Count 4 + Neuronus count in layer 20

Accuracy = 0.81999

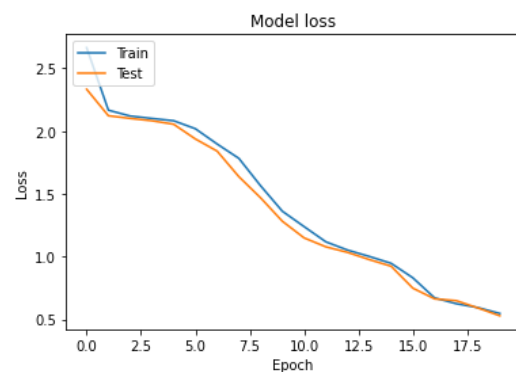
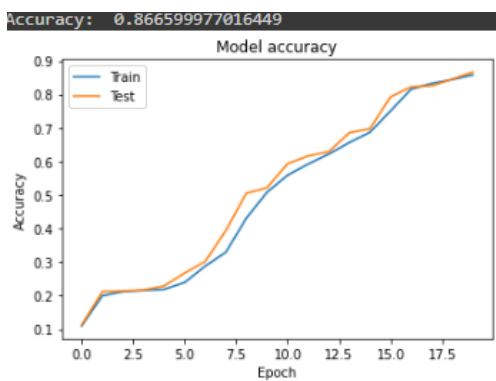
4. Part 2

Layers count: 4

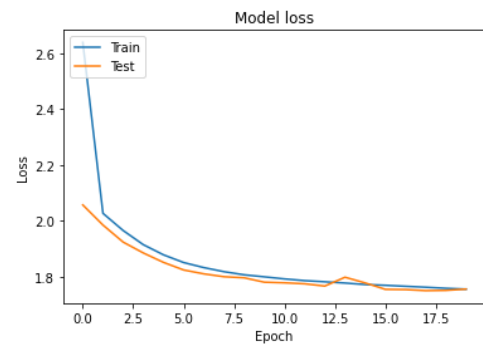
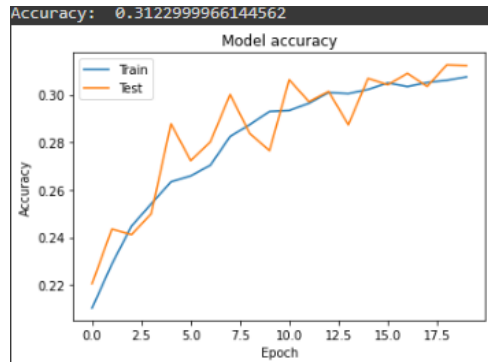
1) Neurons per layer: 20



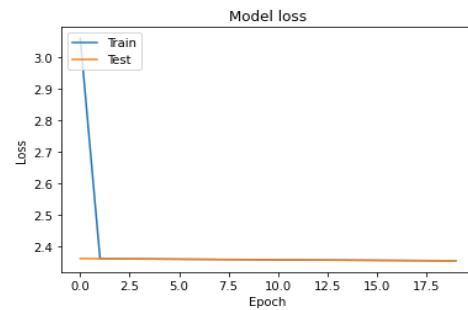
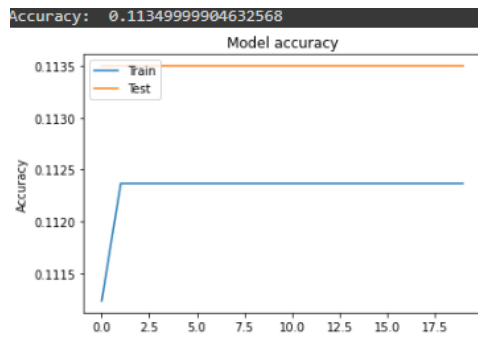
2)Neuronus per layer: 15



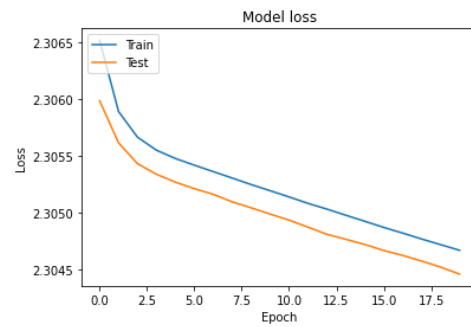
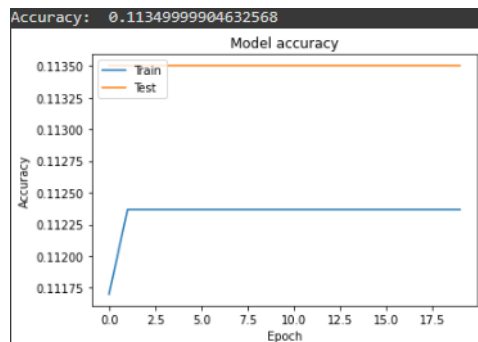
3) Neuronus per layer: 10



4) Neuronus per layer: 5

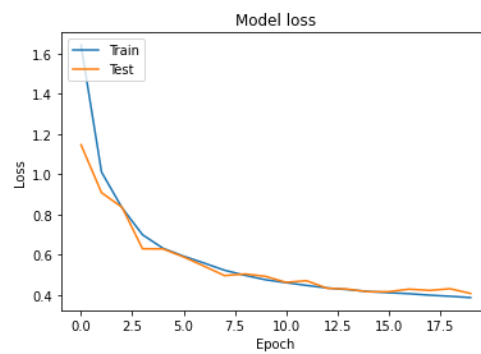
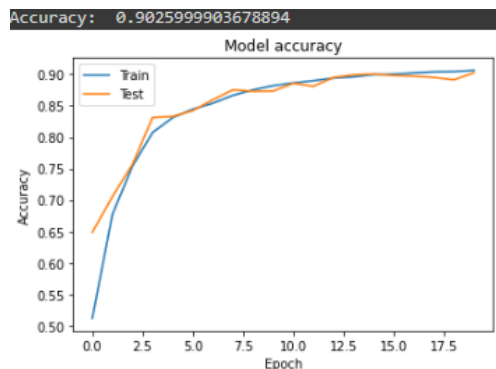


5) Neuronus per layer: 1

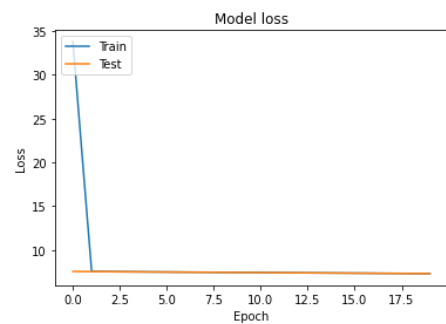
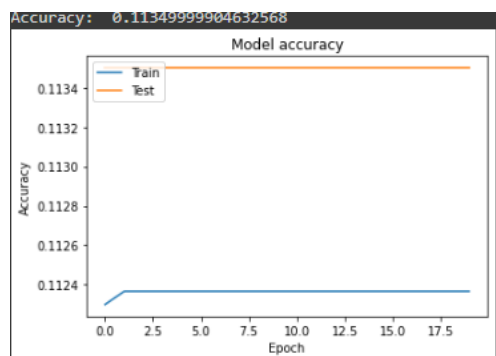


Layers count: 3

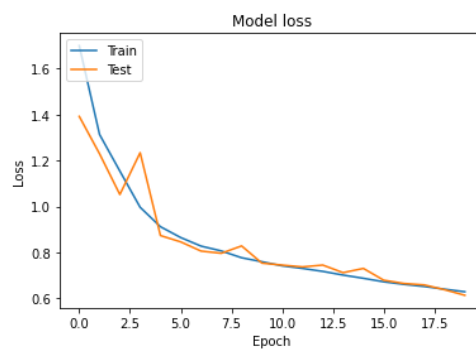
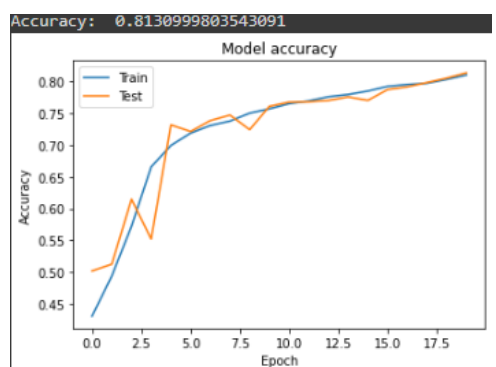
1)Neuronus per layer: 20



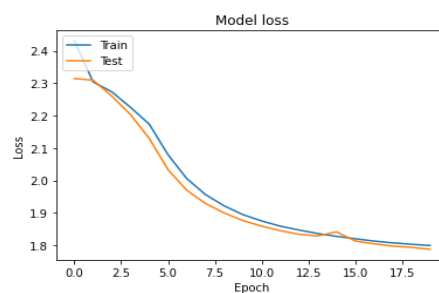
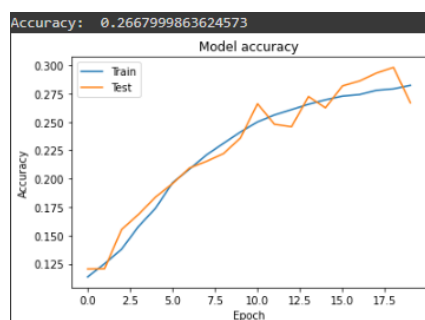
2)Neuronus per layer: 15



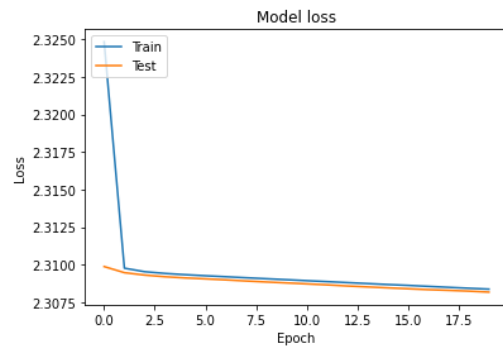
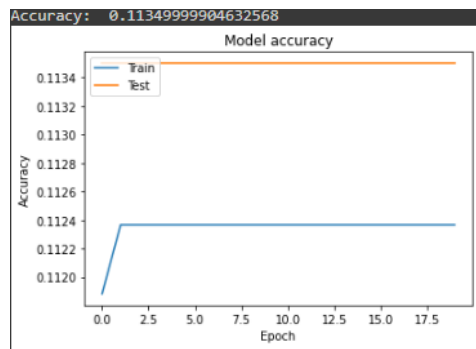
3)Neuronus per layer: 10



4)Neuronus per layer: 5

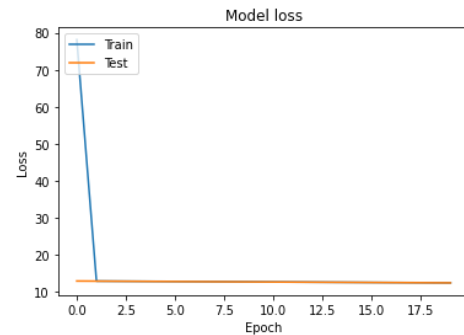
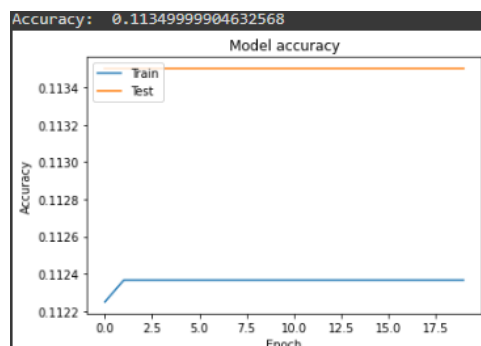


5)Neuronus per layer: 1

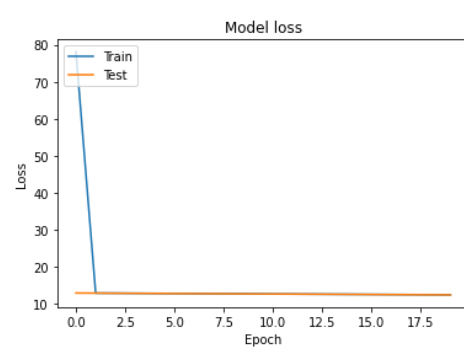
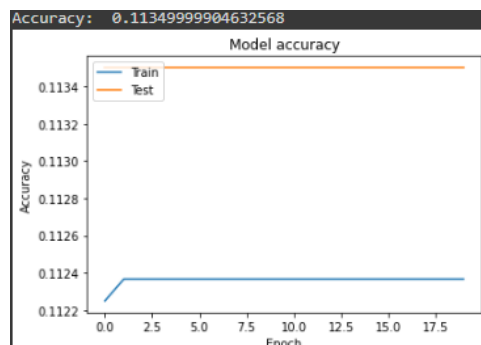


Layers count: 2

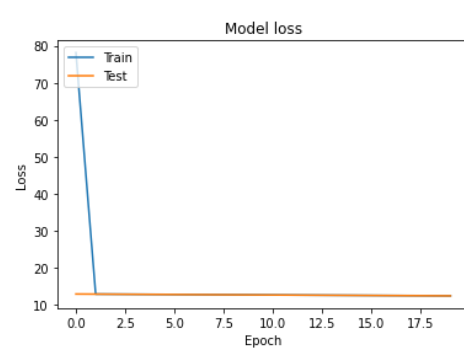
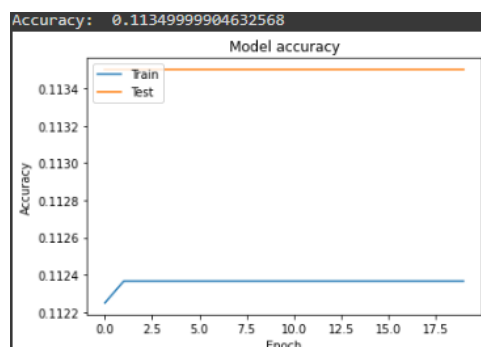
1)Neuronus per layer: 20



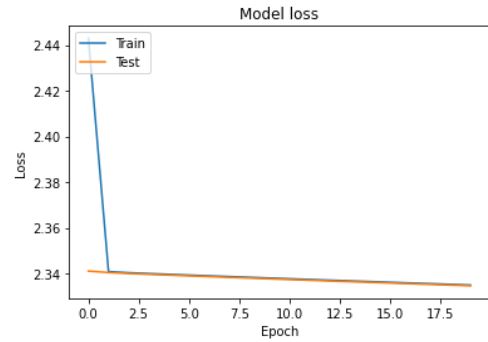
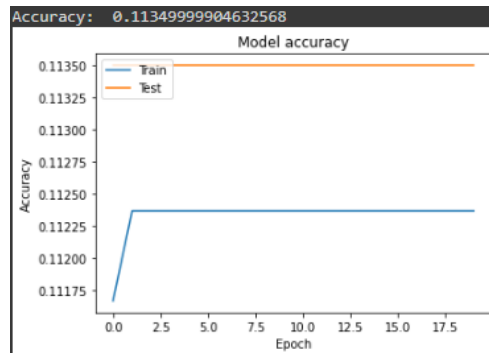
2)Neuronus per layer: 15



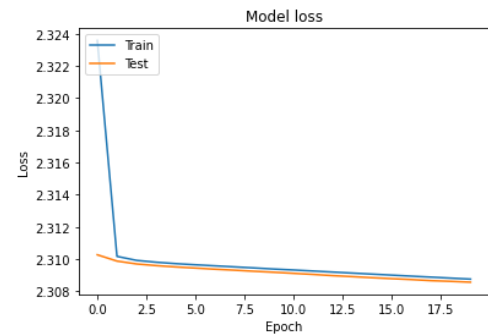
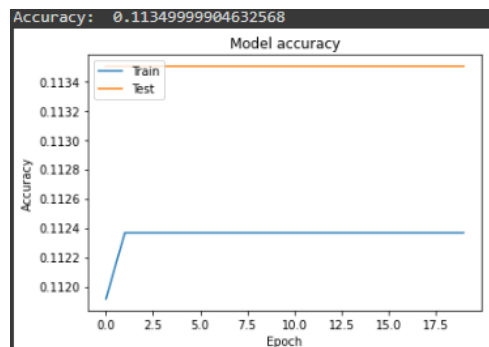
3)Neuronus per layer: 10



4)Neuronus per layer: 5

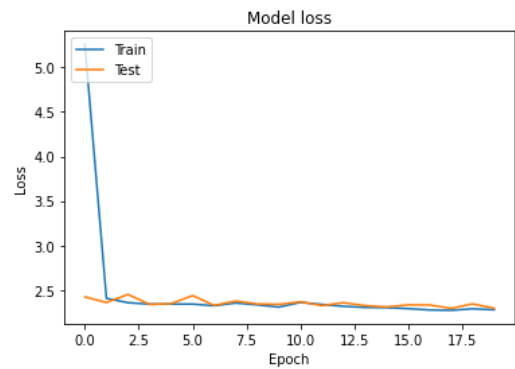
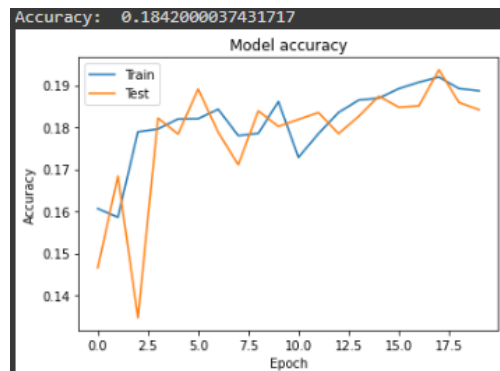


5)Neuronus per layer: 1

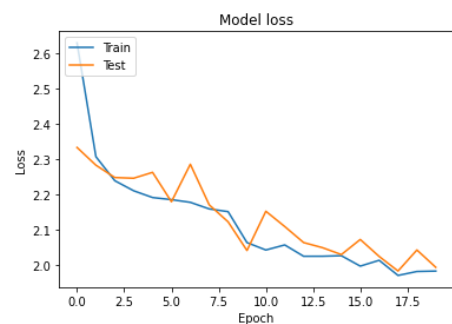
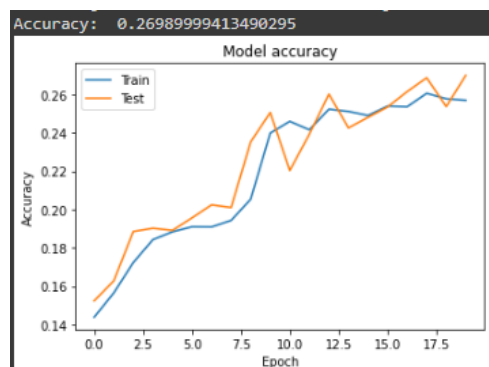


Layers count: 1

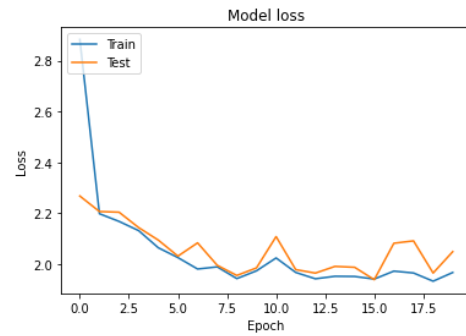
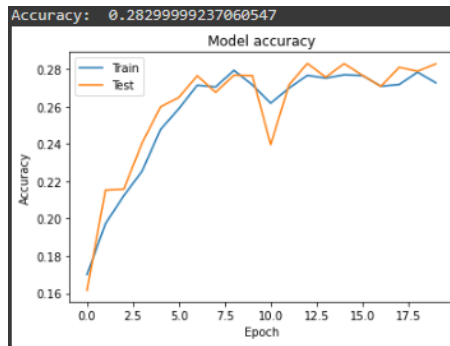
1)Neuronus per layer: 20



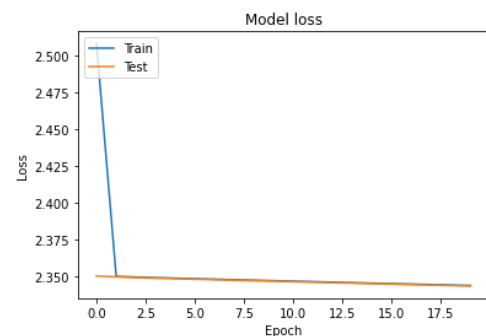
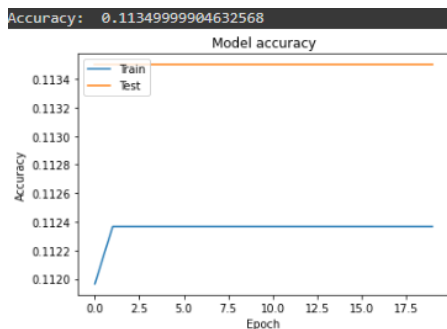
2)Neuronus per layer: 15



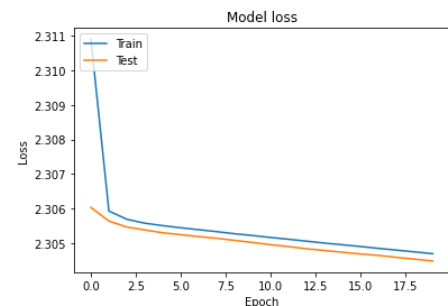
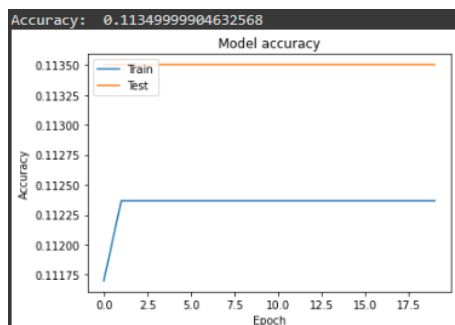
3) Neuronus per layer: 10



4) Neuronus per layer: 5



5) Neuronus per layer: 1



Самым точным оказалось Layers Count 4 + Neuronus count in layer 15

Accuracy = 0.866

Вывод

При выполнении лабораторной работы я изучил работу нейронных сетей, влияние параметров на обучаемость и структуры сети. Попытался, изменяя параметры, достичь максимальной точности.