Final Exam

2021 Fall

Name:

1. Calculate when = 0.2, 0.1, 0.01, 0.001 in the Taylor series of example 2-11 on page 124 in the textbook, and explain the effect of on accuracy

|  |  |  |
| --- | --- | --- |
| 추정값 | 실제값 | 오차 |
| *f*(1.0+0.2)=0.5+1.0\*0.2=0.7 | 0.72 | 0.02 |
| *f*(1.0+0.1)=0.5+1.0\*0.1=0.6 | 0.605 | 0.005 |
| *f*(1.0+0.01)=0.5+1.0\*0.01=0.51 | 0.5101 | 0.0001 |
| *f*(1.0+0.001)=0.5+1.0\*0.001=0.501 | 0.501 | 0.0 |

가 작을수록 오차가 작아, 더 정확하게 근사한다고 말할 수 있다.

A piece of paper with writing

Description automatically generated with medium confidence

2. Figure 4-15 shows data with a three-dimensional structure. Present the convolution equations for Fig. 4-15(a) and Fig. 4-15(b) with reference to equation (4.11) on the page 197 of the textbook, respectively.

[그림 4-15(a)]:

[그림 4-15(b)]:

Text

Description automatically generated

Diagram

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Text, letter

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3. Write the result of applying the kernel in Figure 4-8(b) on the page 198. In this case, add padding(덧대기) 0 and use 0.5 as bias.

4.5000 6.5000 6.5000 6.5000 5.5000 4.5000 3.5000 2.5000

0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000

0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000

0.5000 0.5000 7.5000 14.5000 22.5000 23.5000 24.5000 16.5000

0.5000 0.5000 7.5000 14.5000 22.5000 23.5000 24.5000 16.5000

0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000

0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000

-3.5000 -5.5000 -12.5000 -19.5000 -26.5000 -26.5000 -26.5000 -17.5000

Answer:



- The python code also written in ipynb file that can be opened in google colab

4. Use the convolution result in problem 3 above when the stride length is set to s=2.

4.5000 6.5000 5.5000 3.5000

0.5000 0.5000 0.5000 0.5000

0.5000 7.5000 22.5000 24.5000

0.5000 0.5000 0.5000 0.5000

Answer:



- The python code also written in ipynb file that can be opened in google colab

5. Write the results of applying maximum pooling and average pooling to the results of problem 3, respectively. Use 1 as your stride length.

0 덧대기를 하고 3\*3 마스크를 사용한다고 가정한다.

(1) 최대 풀링

6.5000 6.5000 6.5000 6.5000 6.5000 5.5000 4.5000 3.5000

6.5000 6.5000 6.5000 6.5000 6.5000 5.5000 4.5000 3.5000

0.5000 7.5000 14.5000 22.5000 23.5000 24.5000 24.5000 24.5000

0.5000 7.5000 14.5000 22.5000 23.5000 24.5000 24.5000 24.5000

0.5000 7.5000 14.5000 22.5000 23.5000 24.5000 24.5000 24.5000

0.5000 7.5000 14.5000 22.5000 23.5000 24.5000 24.5000 24.5000

0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000

0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000

Answer:



- The python code also written in ipynb file that can be opened in google colab

(2) 평균 풀링

1.3333 2.1111 2.3333 2.2222 2.0000 1.6667 1.3333 0.7778

1.4444 2.2778 2.5000 2.3889 2.1667 1.8333 1.5000 0.8889

0.3333 1.2778 2.8333 5.2778 7.0556 8.1667 7.5000 4.7778

0.3333 2.0556 5.1667 10.0556 13.6111 15.8333 14.5000 9.2222

0.3333 2.0556 5.1667 10.0556 13.6111 15.8333 14.5000 9.2222

0.3333 1.2778 2.8333 5.2778 7.0556 8.1667 7.5000 4.7778

-0.7778 -2.0556 -3.8333 -6.1667 -7.7222 -8.5000 -7.5000 -4.6667

-0.8889 -2.2222 -4.0000 -6.3333 -7.8889 -8.6667 -7.6667 -4.7778



- The python code also written in ipynb file that can be opened in google colab