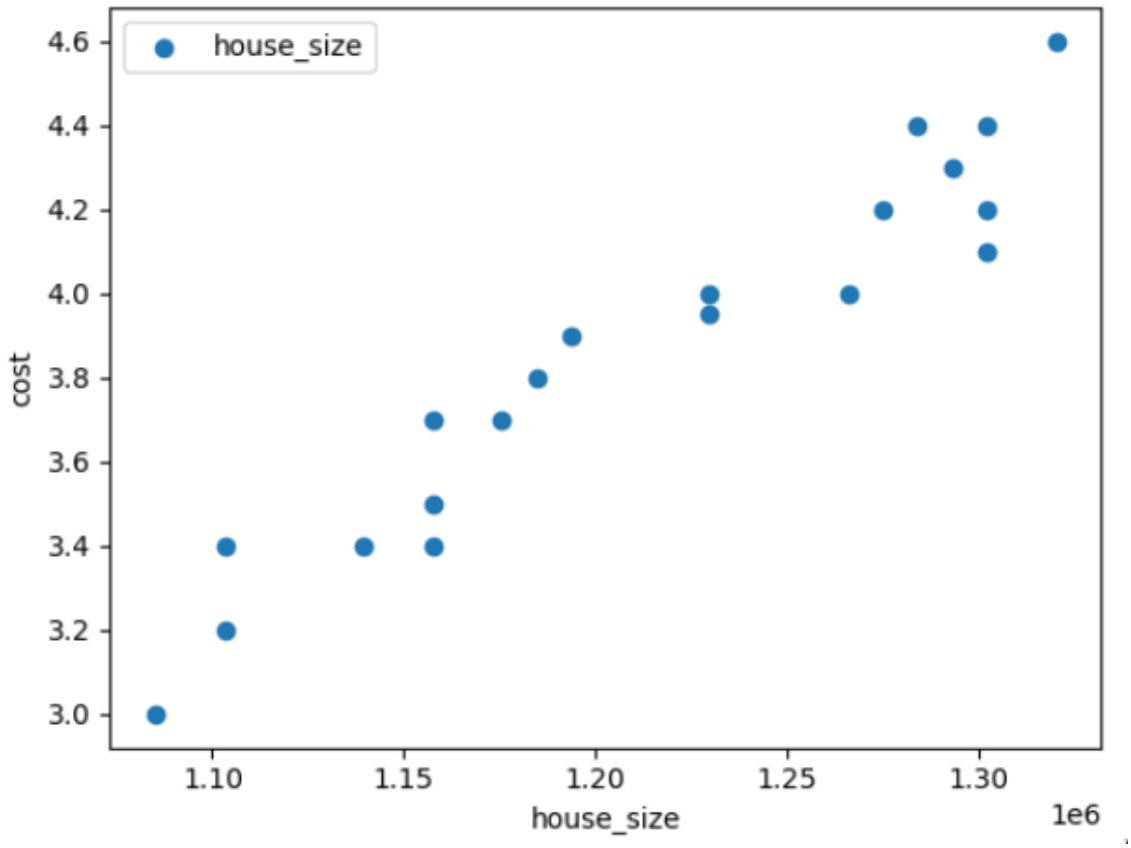
LAB Logbook

Lab 1

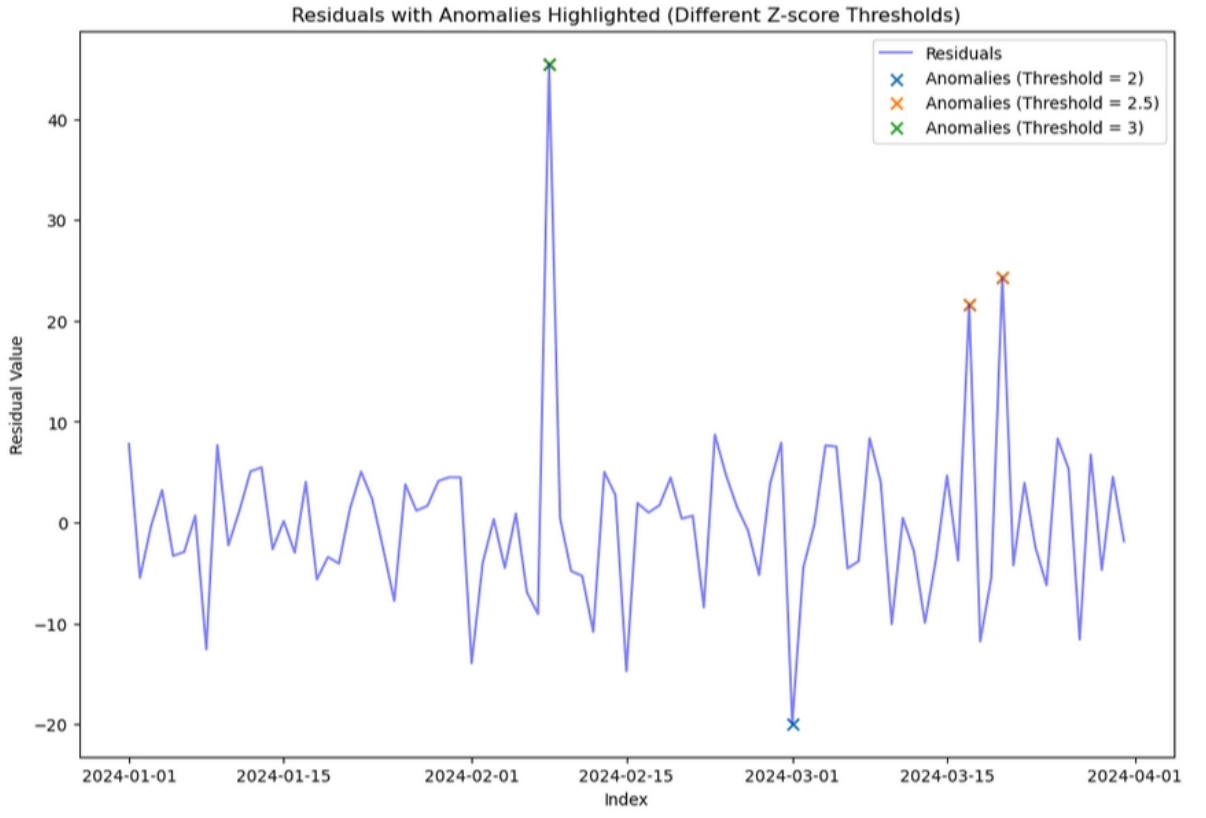
- **Series**: A Pandas Series is a one-dimensional array-like object that can hold any data type and has an associated index for easy labelling and access.
- **DataFrame**: A DataFrame is a two-dimensional, tabular data structure with rows and columns, making it ideal for storing and manipulating datasets.
- **Index**: An Index in Pandas is an immutable array used for labelling and aligning data in Series or DataFrames, enabling efficient data retrieval and manipulation.
- **Categorical**: The Categorical type in Pandas allows for efficient storage and manipulation of data with a fixed number of possible values, making it ideal for handling categorical data.
- **DatetimeIndex**: A DatetimeIndex is a specialised index in Pandas for handling time series data, allowing for fast date-based indexing and resampling operations.

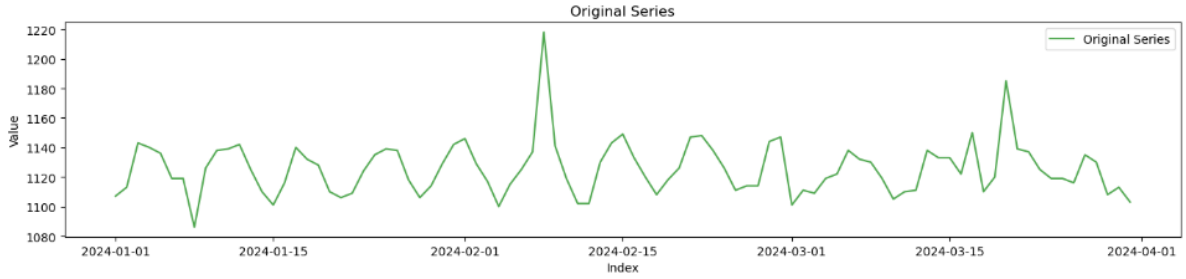
Lab 2

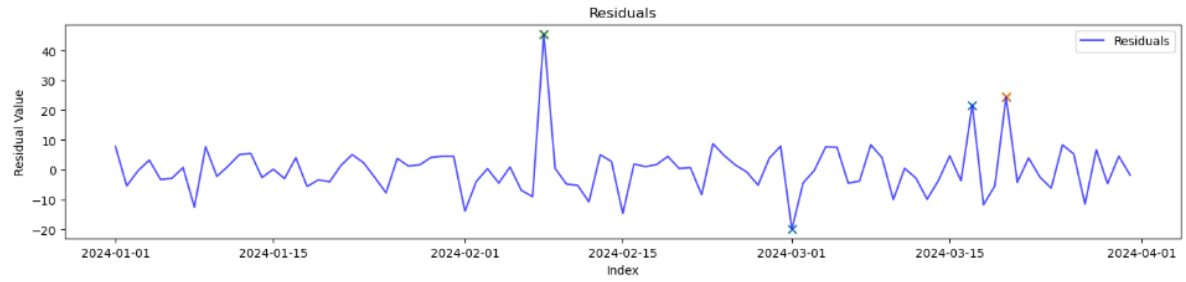


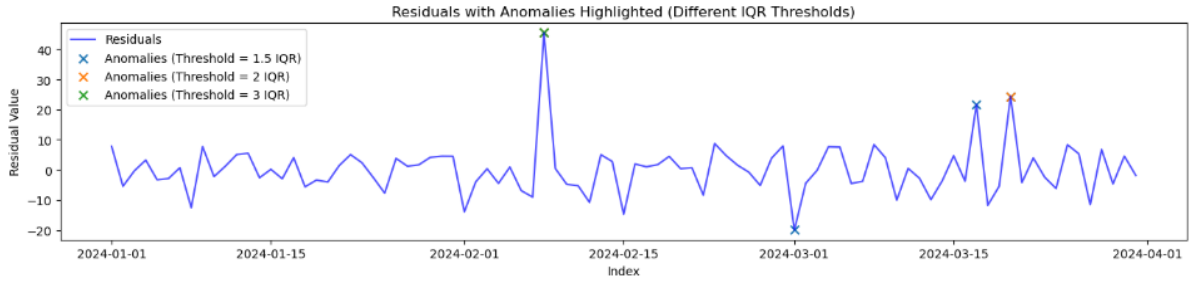
Price guess for size of SID*0.75 = 4.9

Lab 3

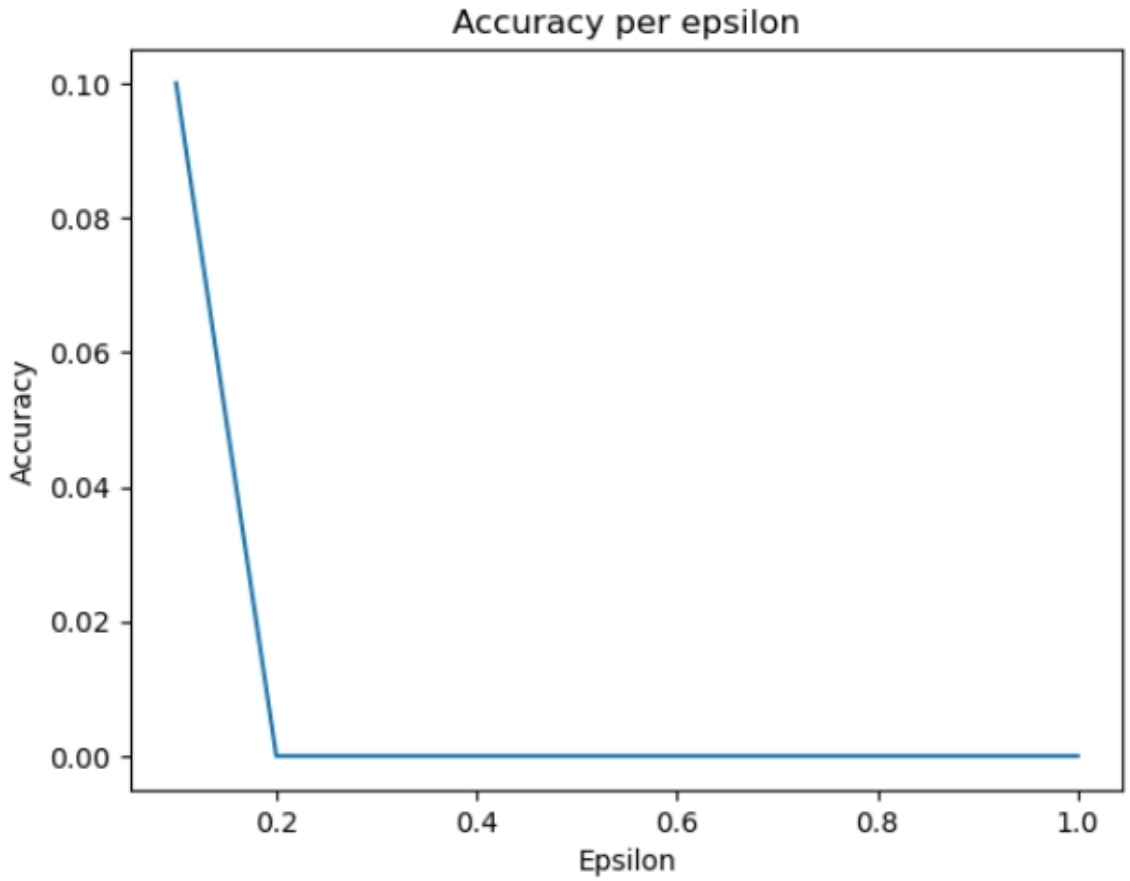



Original Series
Original Series
Value
Index
2024-01-01
2024-01-15
2024-02-01
2024-02-15
2024-03-01
2024-03-15
2024-04-01


Residuals
Residuals
Residual Value
Index


Residuals with Anomalies Highlighted (Different IQR Thresholds)
Residuals
Anomalies (Threshold = 1.5 IQR)
Anomalies (Threshold = 2 IQR)
Anomalies (Threshold = 3 IQR)
Residual Value
Index

Lab 4



The higher the epsilon value, the less accuracy there is. The model is very weak against adversarial attacks.

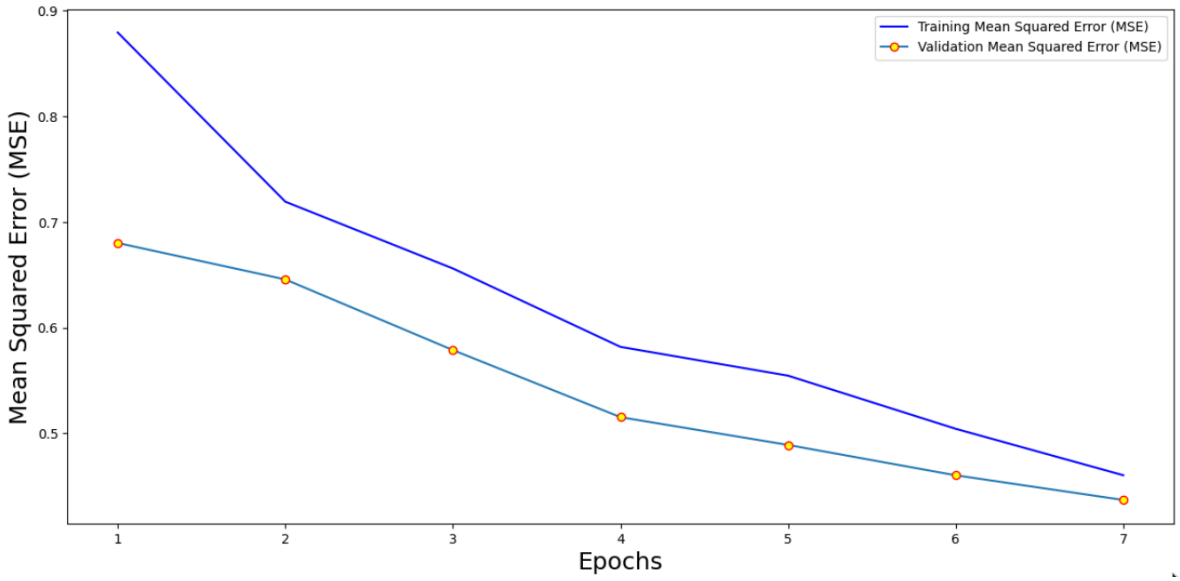
```
313/313 ━━━━━━━━━━━━━━━━━━━━ 1s 4ms/step - accuracy: 0.9769 - loss: 0.1016
Test Accuracy Original: 0.9798
```

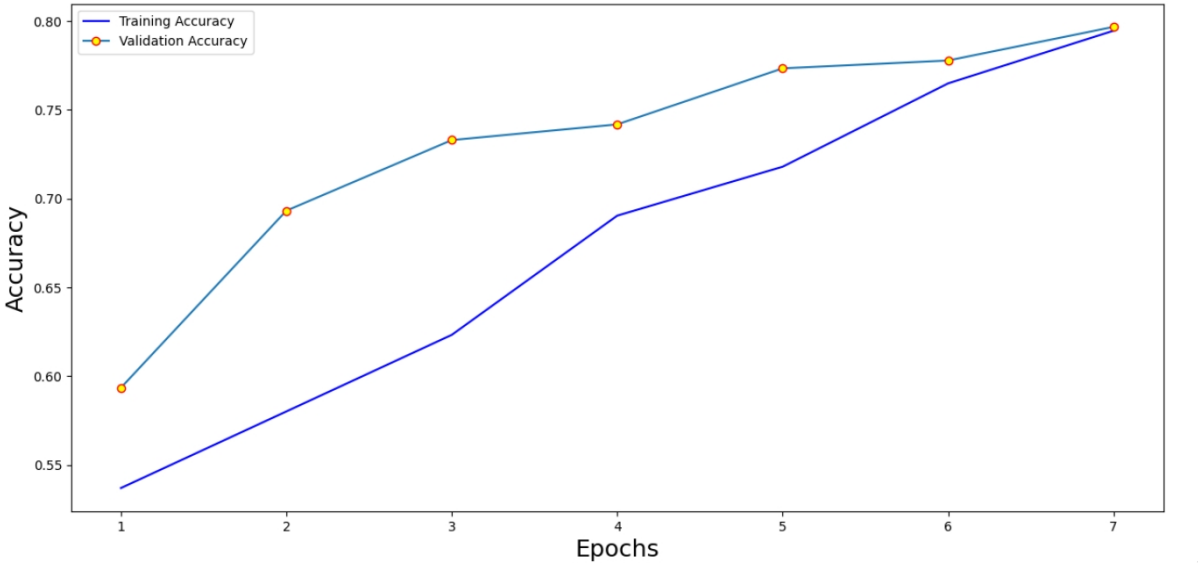
```
313/313 ━━━━━━━━━━━━━━━━━━━━ 1s 4ms/step - accuracy: 0.1027 - loss: 123255.7109
Test Accuracy poisoned: 0.1028
```

Lab 5

```
Time for epoch 31 is 11.749621391296387 sec
```

Lab 6


Training Mean Squared Error (MSE)
Validation Mean Squared Error (MSE)
Mean Squared Error (MSE)
Epochs
0.9
0.8
0.7
0.6
0.5
1
2
3
4
5
6
7


Training Accuracy
Validation Accuracy
Accuracy
Epochs
0.80
0.75
0.70
0.65
0.60
0.55
1
2
3
4
5
6
7

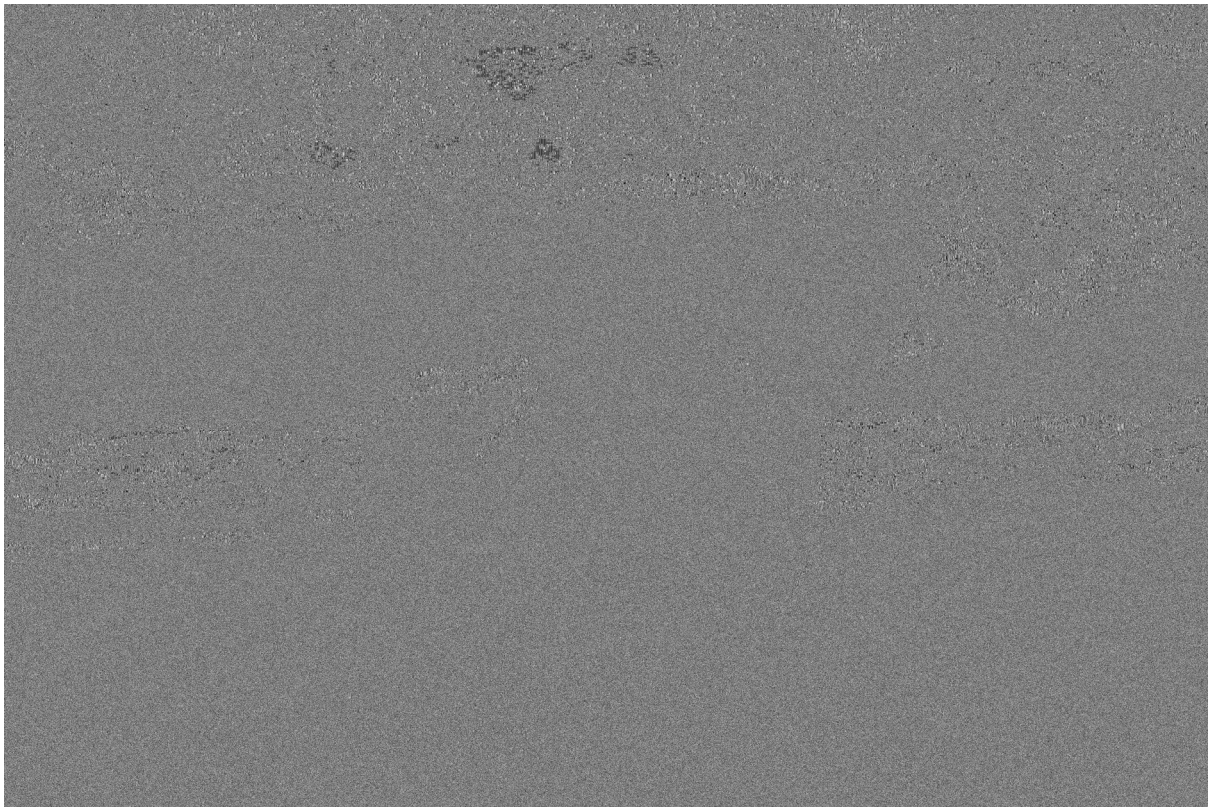
Lab 7

DES

```
Enter the key (8 bytes):  SecretKe
<class 'bytes'>
Enter the text to encrypt:  HelloCrypto
Encrypted text: HQqgsqSEljgBPH7L4con0w==
Decrypted text: HelloCrypto
```

AES

```
Enter the key (24 bytes):  fffffffffhhhhhhhhhhjjjj
Enter the text to encrypt:  adsfadfs
<class 'str'>
AES Encrypted: JIBUfy1kUpQWa4Tdavd7Ow==
AES Decrypted: adsfadfs
```



3. Explain in one word - 'YES' or 'NO' whether your encryption method for the images is good.

YES

Lab 8

Lab 9

Lab 10

Lab 11

Lab 12