

GOLDEN OWL SOLUTION

REPORT

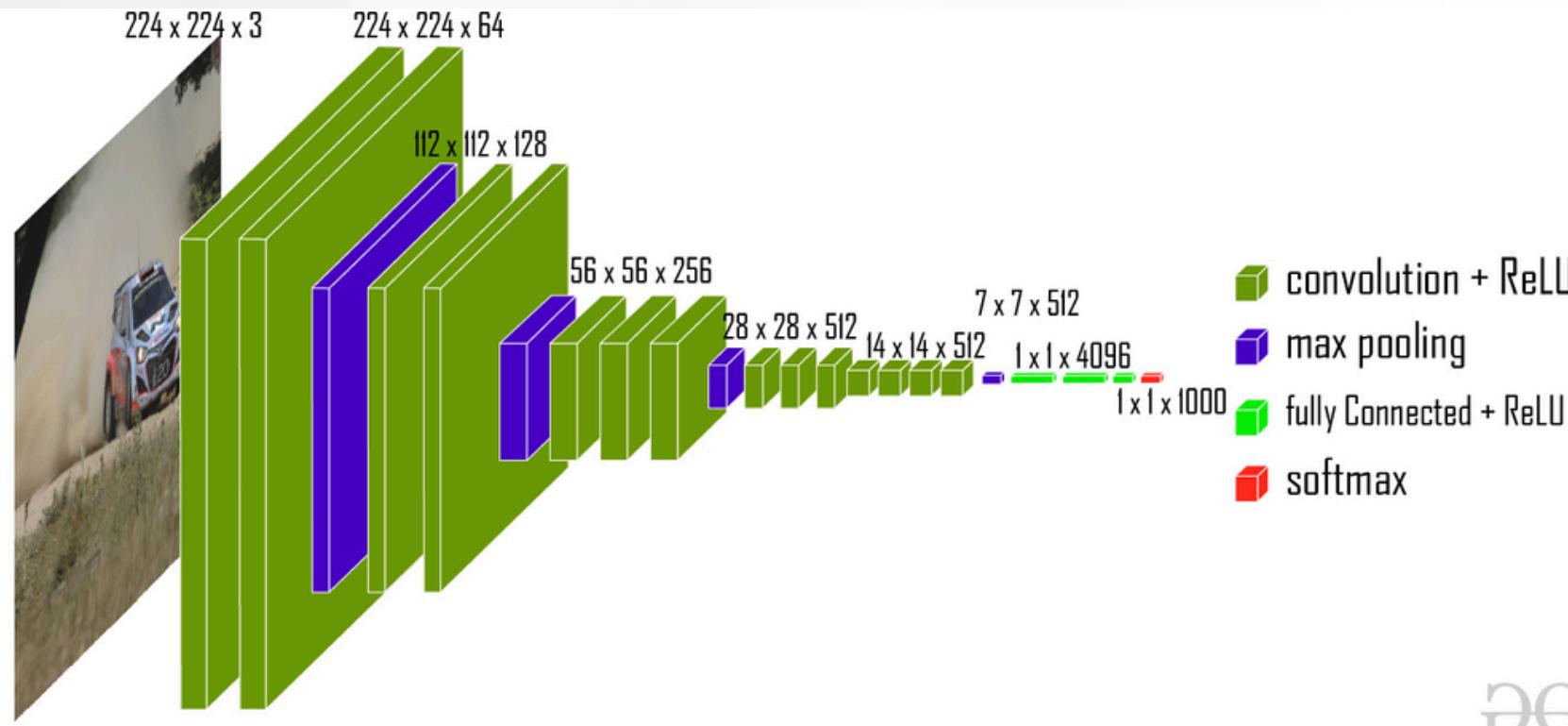
Code test 1

TASK 1

Image Classification (Cats & Dogs)

MODEL INTRODUCTION

VGG 16



VGG 16 Architecture

Start with a Pre-Trained Model

- VGG16: A deep 16-layer CNN, expert at general image feature extraction from ImageNet.

Adapt for Our Task (Transfer Learning)

- Remove the original 1000-class ImageNet classifier.
- Add a new, custom 2-class (Cat/Dog) classifier.

Train on Custom Data

- Freeze the base layers to keep the learned features.
- Train only the new classifier on the **Cat and Dog** dataset.

DATASET CAT AND DOG

Dataset Link:

<https://www.kaggle.com/datasets/tongpython/cat-and-dog>



Dog image taken from the dataset

The Dataset consist of: **10 028** images

Train:

- Cats: **4001** images
- Dogs: **4005** images

Test:

- Cats: **1011** images
- Dogs: **1012** images

Cat image taken from the dataset



PREPROCESS

NORMALIZATION

- All training and validation images were normalized.
- Pixel values were rescaled from the [0, 255] range to the [0, 1] range.

AGUMENTATION

- To reduce overfitting I augmented the dataset
- These included random rotations, zooms, shifts, shear and horizontal flips.

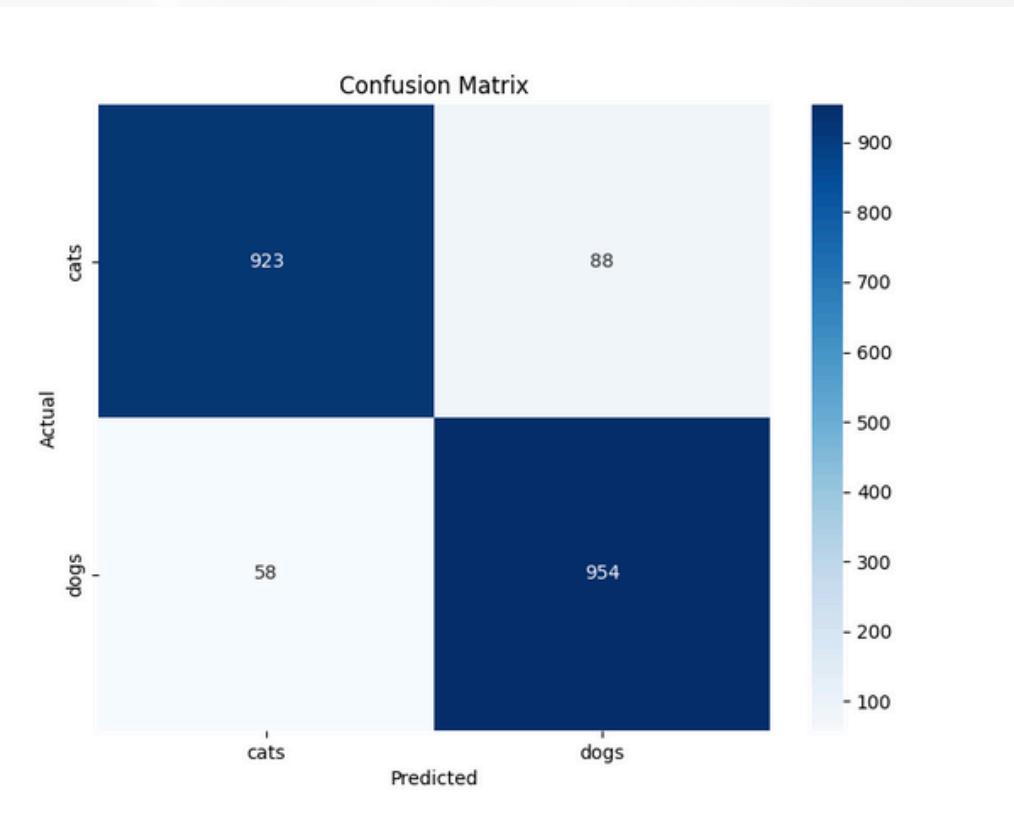
TRAINING RESULT

Training Config:

- Image Size: 224x224
- Batch Size: 32
- Epochs: 25
- Learning Rate: 0.0001
- Loss: Binary Cross-Entropy

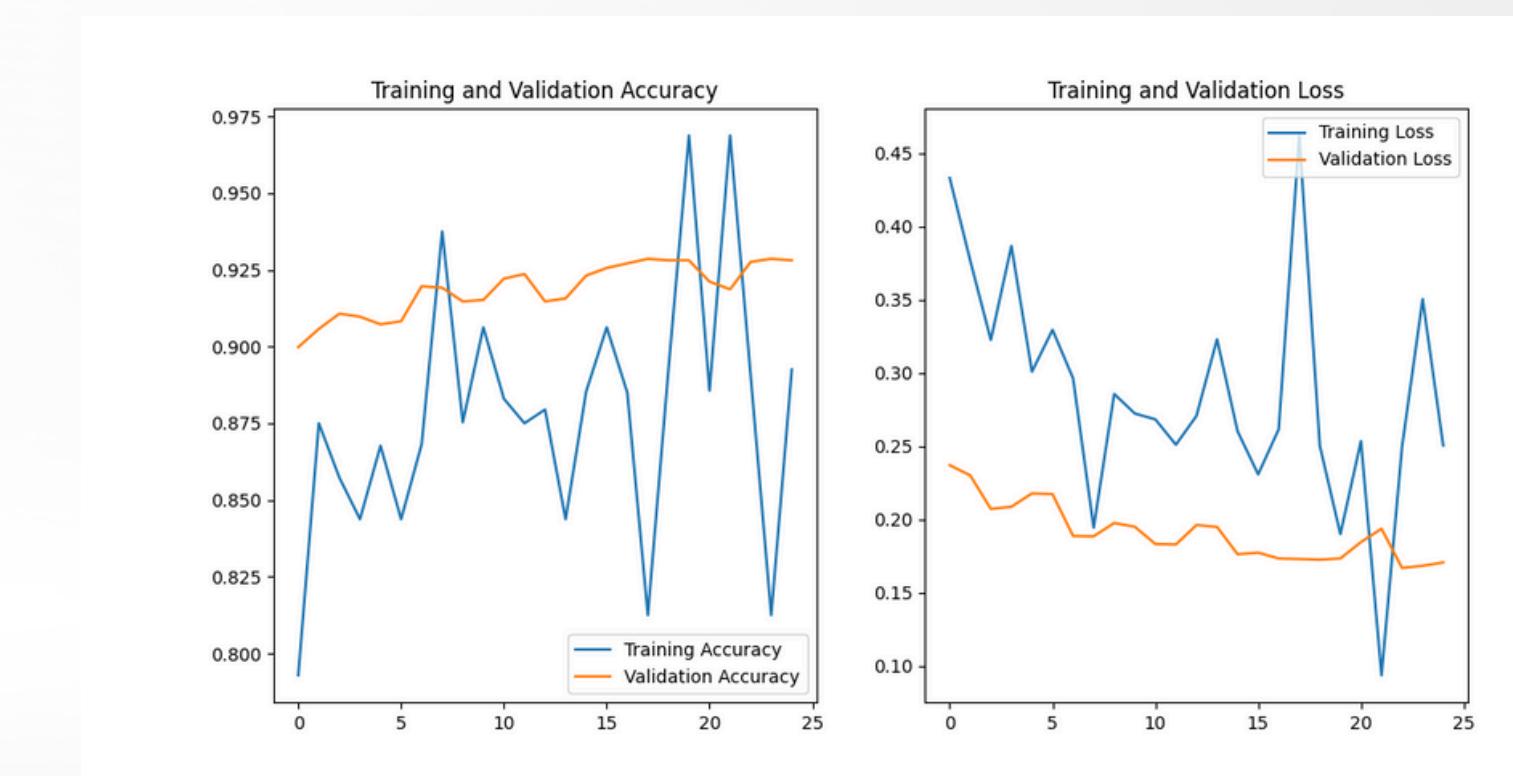
Overall Results:

- Final Training Loss (Epoch 25): 0.2549
- Final Training Accuracy (Epoch 25): 89.0%
- Final Validation Loss (Epoch 25): 0.1705
- Final Validation Accuracy (Epoch 25): 92.8%
- Best Validation Loss : 0.1705
- Best Validation Accuracy: 92.9%



Confusion Matrix

Training History



ANALYSIS AND OBSERVATIONS

1. **Excellent Performance:** The model achieved a high peak validation accuracy of approximately **92.9%**, demonstrating its strong predictive power on unseen data.
2. **Strong Generalization & No Overfitting:** The validation loss consistently decreased throughout the training process, and validation accuracy remained higher than training accuracy. This is a clear indicator that the data augmentation and dropout were highly effective at preventing the model from "memorizing" the training data.
3. **Stable Convergence:** The model's performance on the validation set began to plateau around epoch 18, suggesting that the training had reached a point of optimal performance within the 25-epoch cycle.

Conclusion

- The training was a success. The final model is well-trained, robust, and generalizes effectively to new data, achieving a validation accuracy of approximately 92.8%. The use of a pre-trained VGG16 base, combined with data augmentation, proved to be an effective strategy for preventing overfitting and achieving high performance.

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COMPANY VALUES

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OUR COMPANY VISION

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OUR COMPANY **PERFORMANCE**

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MEET OUR **TEAM MEMBERS**

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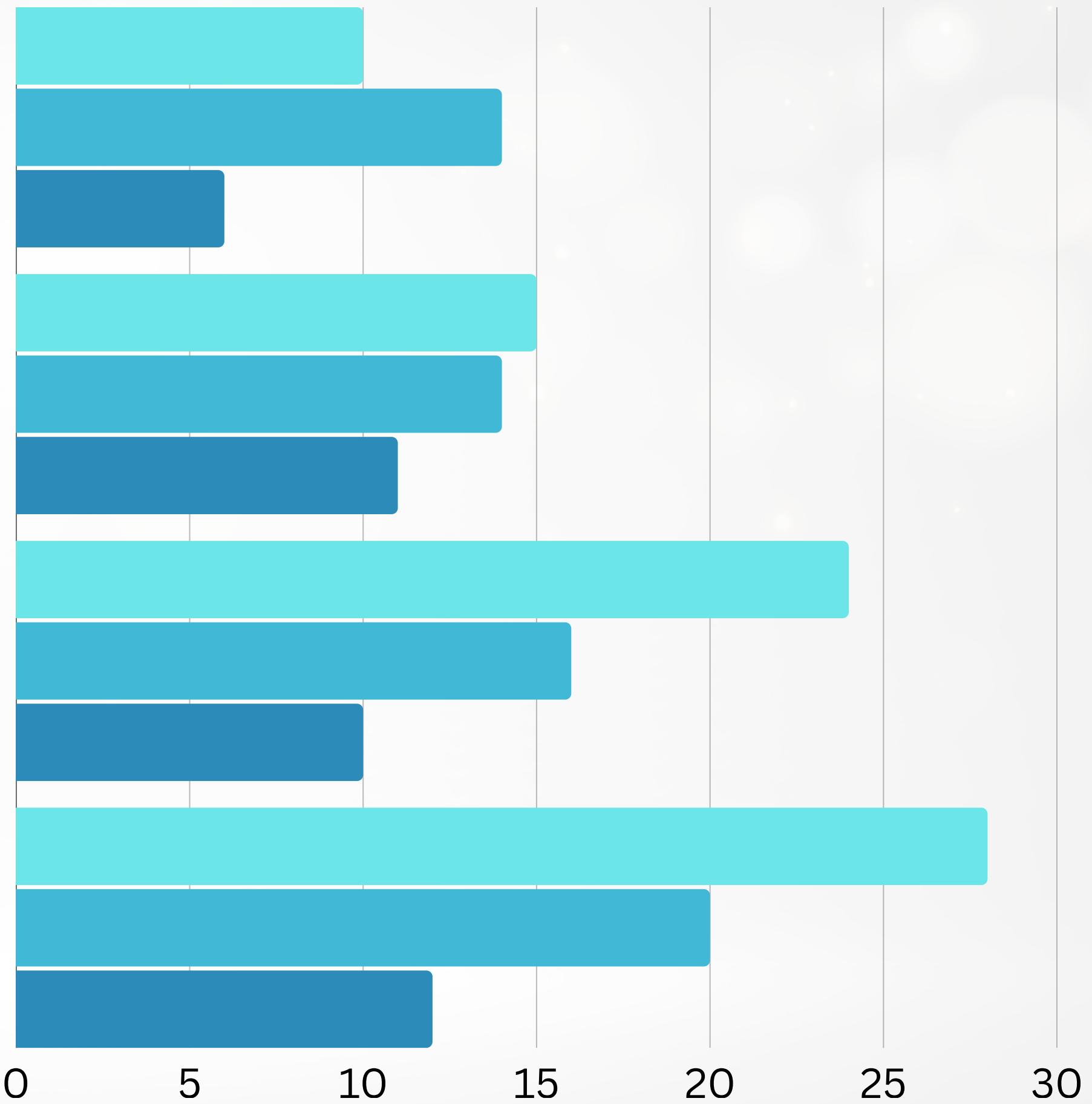
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OUR YEARLY FLOW CHART

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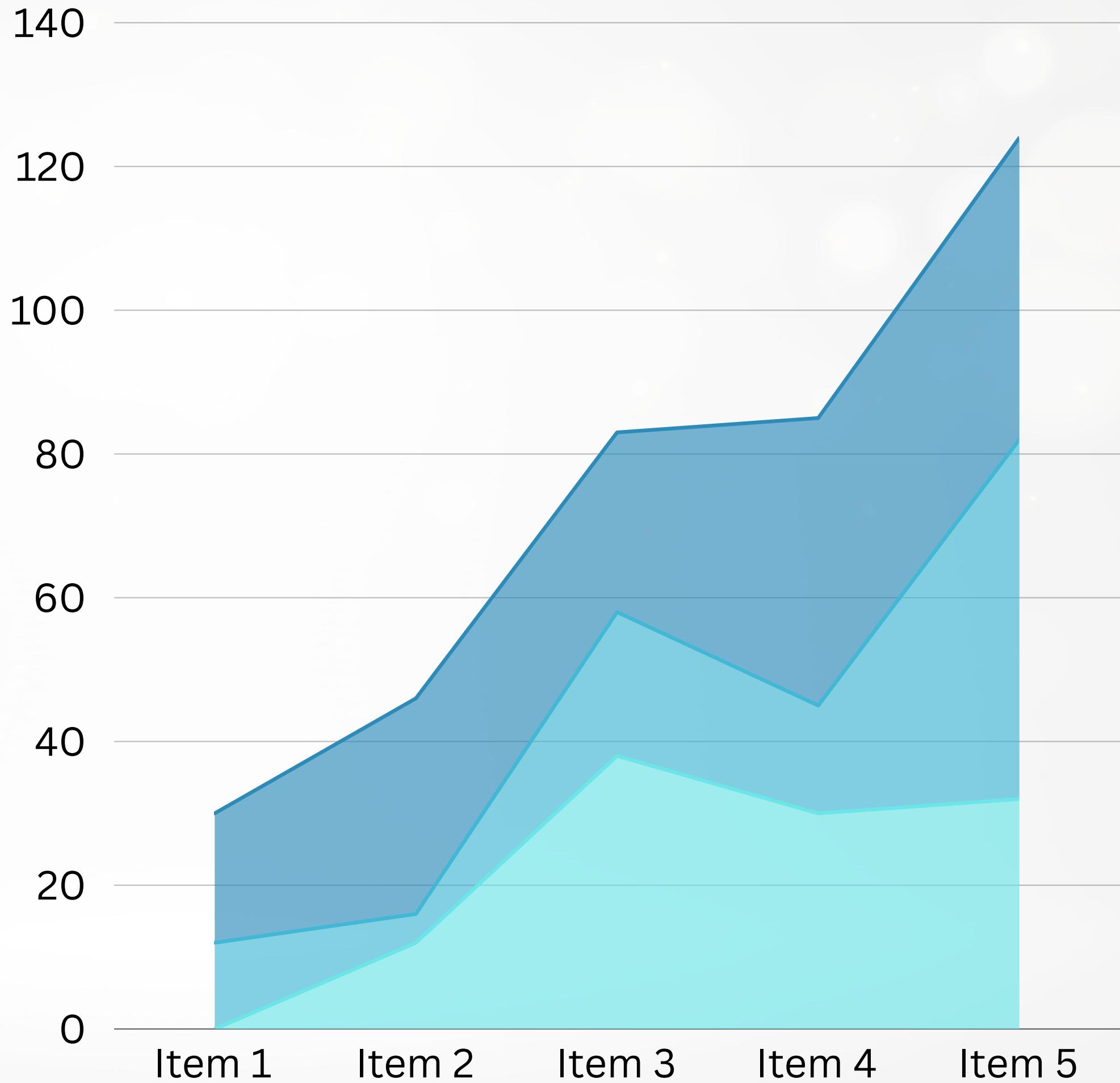
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Item 1



DETAILS 2

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OUR NEW PLANNING

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