**Model Development Phase**

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| **Date** | 17 June 2025 |
| **Team ID** | SWTID1749876754 |
| **Project Title** | SynapseScan: AI Driven Classification of Ovarian Cancer Variants |
| **Maximum Marks** | 6 Marks |

**Model Selection Report**

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

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| **Model** | **Description** | **Hyperparameters** | **Performance Metric (e.g., Accuracy, F1 Score)** |
| **InceptionV3 + Attention + Fine-tuning** | Deep convolutional neural network with Inception architecture enhanced with attention mechanisms and fine-tuned on target dataset. Combines feature extraction capabilities of InceptionV3 with attention-based focus on relevant image regions, optimized through transfer learning for improved classification performance. | Batch Size = 32, Img Size = (224, 224), Train Size = 0.8, Validation Size = 0.1, Test Size = 0.1, RandomOverSampler(random\_state=42), num\_heads = 8, key\_dim = 2048, GaussianNoise(0.25), Dense(512, activation='relu'), Dropout(0.25), epochs = 20, patience = 5 | Accuracy score = 93.84% |
| **InceptionV3 + Attention** | Pre-trained InceptionV3 architecture integrated with attention mechanisms without fine-tuning. Leverages powerful feature extraction from ImageNet pre-training while incorporating attention to focus on discriminative image regions for classification tasks. | Batch Size = 32, Img Size = (224, 224), Train Size = 0.8, Validation Size = 0.1, Test Size = 0.1, RandomOverSampler(random\_state=42), num\_heads = 8, key\_dim = 2048, GaussianNoise(0.25), Dense(512, activation='relu'), Dropout(0.25), epochs = 20, patience = 5 | Accuracy score = 77.34% | |
| **MobileNet + Fine-tuning** | Lightweight convolutional neural network designed for mobile and embedded applications, fine-tuned on target dataset. Utilizes depthwise separable convolutions for efficient computation while maintaining competitive accuracy through transfer learning optimization. | Img Size = (160, 160), Batch Size = 64, Learning Rate = 0.0005, Dropout Rate = 0.2, Dense Units = 256, epochs = 25, Trainable Layers = 50 | Accuracy score = 36.21% | |