1 LeNet, VGGNet14, AlexNet, GoogleNet and Inception

LeNet, VGGNet14 and AlexNet were three somewhat "traditional" neural networks where the data is feed-forwarded through the network without any branching. ResNet broke this tradition by replacing traditional-style layers with blocks which have as output the summation of some convolution layers and the input activations of the block. Also in GoogleNet this traditional-style layer-by-layer forwarding is broken whereas we could replace a single layer by a block (which, of course then consists out of layers by itself) when using blocks to build a neural network. In the GoogleNet inception modules were used to get more feature-representation-capacity by using multiple different-sized convolution layers (each on a separate path) to extract detailed features (with small filter sizes) and less detailed features with higher filter sizes in one inception block.
Inception-ResNet-v1 and Inception-ResNet-v2 replaced a part of these convolution layers in an inception block by a residual connection (meaning the activations are simply feeded through and added to the convolutions at the end of an inception-residual block). Inception-v4 continued the Inception-v3-idea but was less complex due to replacement of backend technology (DistBelief to TensorFlow).