Following are the utilities provided by PHPNeuroForge and how to use it:

First of all don't forget to import PHPNeuroForge and necessary files

1. **Future Value of an Ordinary Annuity (FV)**
    a. Example or use:
        i. $fv = $utility->**calculateFutureValue**(100, 0.05, 10);
2. **Present Value of an Ordinary Annuity (PV)**
    a. Example or use:
        i. $pv = $utility->**calculatePresentValue**(100, 0.05, 10);
3. **Future Value of an Annuity Due**
    a. Example or use:
        i. $futureValueDue = $utilities->**calculateFutureValueDue**($payment, $interestRate, $periods);
4. **Present Value of an Annuity Due**
    a. Example or use:
        i. $pvDue = $utils->**calculatePresentValueDue**($payment, $interestRate, $periods);
5. **Payment for an Ordinary Annuity**
    a. Example of use:
        i. $payment = $utils->**calculatePayment**($pv, $rate, $periods);
6. **Number of Periods for an Ordinary Annuity**
    a. Example of use:
        i. $numberOfPeriods = $utils->**calculateNumberOfPeriods**($presentValue, $rate, $payment);
7. **Annuity Due Present Value to Ordinary Annuity Present Value Conversion**
    a. Example of use:
        i. $ordinaryPV = $utils->**calculatePVFromAnnuityDue**($annuityDuePV);
8. **Annuity Payment Growth Rate (g)**
    a. Example of use:
        i. $growthRate = $utils->**calculateAnnuityPaymentGrowthRate**($presentValue, $futureValue, $periods);
9. **Present Value of Perpetuity**
    a. Example of use:
        i. $pvPerpetuity = $utils->**calculatePresentValuePerpetuity**($payment, $discountRate);
10. **Continuous Compounding for Annuities**
    a. Example of use:
        i. $pvContinuous = $utils->**calculateContinuousPV**($payment, $interestRate, $periods);

ii. $fvContinuous = $utils->**calculateContinuousFV**($payment, $interestRate, $periods);

11. **Annuity Due Payment for Present Value**
    a. Example of use:
        i. $annuityDuePayment = $utils->**calculateAnnuityDuePayment**($presentValue, $interestRate, $periods);
12. **Growth Rate with Different Payment and Withdrawal Frequencies**
    a. Example of use:
        i. $effectiveRate = $utils->**calculateEffectiveRate**($annualRate, $paymentFrequency, $compoundingFrequency);
13. **Present Value of Growing Annuity**
    a. Example of use:
        i. $presentValueGrowingAnnuity = $utils->**calculatePresentValueGrowingAnnuity**($payment, $growthRate, $discountRate, $nPeriods);
14. **Future Value of Growing Annuity**
    a. Example of use:
        i. $futureValueGrowingAnnuity = $utils->**calculateFutureValueGrowingAnnuity**($payment, $growthRate, $discountRate, $nPeriods);
15. **Present Value of Annuity with Continuous Payments**
    a. Example of use:
        i. $presentValueContinuousAnnuity = $utils->**calculatePresentValueContinuousAnnuity**($payment, $discountRate, $nPeriods);
16. **Present Value of Annuity with Varying Payments**
    a. Example of use:
        i. $presentValueVaryingAnnuity = $utils->**calculatePresentValueVaryingAnnuity**($payments, $discountRate);
17. **Number of Periods for a Growing Annuity**
    a. Example of use:
        i. $numberOfPeriods = $utils->**calculateNumberOfPeriodsGrowingAnnuity**($presentValue, $payment, $growthRate, $discountRate);
18. **Linear Equation (Neuron input)**
    a. Example of use:
        i. $neuronInput = $utils->**calculateLinearEquation**($weights, $inputs, $bias);
19. **Activation Functions: Sigmoid**
    a. Example of use:
        i. $sigmoidResult = $utils->**calculateSigmoid**($z);
20. **Activation Functions: ReLU (Rectified Linear Unit)**

    a. Example of use:
        i. $ReLUResult = $utils->**calculateReLU**($z);
21. **Activation Functions: TanH**
    a. Example of use:
        i. $TanHResult = $utils->**calculateTanH**($z);
22. **Activation Functions: Softmax (for multi-class classification)**
    a. Example of use:
        i. $softmaxResult = $utils->**calculateSoftmax**($values);
23. **Loss Functions: Mean Squared Error (MSE)**
    a. Example of use:
        i. $mseResult = $utils->**calculateMSE**($predictions, $targets);
24. **Loss Functions: Cross-Entropy Loss (Binary)**
    a. Example of use:
        i. $bceResult = $utils->**calculateBinaryCrossEntropy**($predictions, $targets);
25. **Loss Functions: Cross-Entropy Loss (Multi-class)**
    a. Example of use:
        i. $ceResult = $utils->**calculateMultiClassCrossEntropy**($predictions, $targets);
26. **Gradient Descent (Update Rule): Gradient Descent**
    a. Example of use:
        i. $newWeights = $utils->**gradientDescent**($weights, $learningRate, $gradient);
27. **Backpropagation: Chain Rule**
    a. Example of use:
        i. $result = $utils->**chainRule**($outerDerivative, $innerDerivative);
28. **Backpropagation: Weight Update**
    a. Example of use:
        i. $updatedWeight = $utils->**weightUpdate**($currentWeight, $learningRate, $gradient);
29. **Regularization: L1 Regularization**
    a. Example of use:
        i. $l1Regularization = $utils->**calculateL1Regularization**($lambda, $weights);
30. **Regularization: L2 Regularization**
    a. Example of use:
        i. $l2Regularization = $utils->**calculateL2Regularization**($lambda, $weights);
31. **Convolutional Neural Networks (CNNs): Convolution Operation**
    a. Example of use:
        i. $outputFeatureMap = $utils->**calculateConvolutionOperation**($inputMatrix, $filter);
32. **Convolutional Neural Networks (CNNs): Pooling (Max/Average Pooling)**
    a. Example of use:

i. $outputPoolingMax = $utils->**calculatePooling**($inputMatrix, $windowSize, 'max');
ii. $outputPoolingAvg = $utils->**calculatePooling**($inputMatrix, $windowSize, 'average');

33. **Recurrent Neural Networks (RNNs): Hidden State Update**
    a. Example of use:
        i. $updatedHiddenState = $utils->**calculateHiddenStateUpdate**($inputVector, $prevHiddenState, $weightsInput, $weightsHidden, $bias, $activation);
34. **Recommendation Systems**
    a. Implement ANNs to power recommendation engines for personalized content, products, or services based on user behavior, preferences, or historical data.
        i. Example of use:
            1. $recommendedItems = $utils->**recommendItems**($userData);
35. **Natural Language Processing (NLP)**
    a. Deploy ANNs to enable sentiment analysis, text summarization, language translation, or chatbots for customer support, enhancing user interaction and engagement.
        i. Example of use:
            1. $sentiment = $util->**performNLP**($text, 'sentiment_analysis');
            2. $translatedText = $util->**performNLP**($text, 'translation');
36. **Image and Video Processing**
    a. Utilize ANNs for image recognition, object detection, or video content analysis, enabling features like image search, automatic tagging, or video content recommendations.
        i. Example of use:
            1. $imageRecognitionResult = $utilities->**performImageRecognition**($imagePath);
            2. $videoAnalysisResult = $utilities->**analyzeVideoContent**($videoPath);
37. Anomaly Detection and Security:
    a. dd
        i. fff
            1. $anomalyDetectionResult = $utilities->**performAnomalyDetection**($webTrafficData);