1. Problem Statement:

FizzBuzz Task. In this task an integer divisible by 3 is printed as Fizz, and integer divisible by 5 is printed as Buzz. An integer divisible by both 3 and 5 is printed as FizzBuzz.

Solution

2) **Method 1 (Software1 method)** : Implemented the below fizzbuzz algorithm in python using if-else statements.

> **Result:** fizzbuzz labelled integer
> **Initialization** : low = 1, high = 100 ;
> **while** *low ≤ high* **do**
> > *if low % 15 = 0: print("fizzbuzz");*
> > *elif low % 3 = 0: print("fizz");*
> > *elif low % 5 = 0: print("buzz");*
> > *else: print(low);*
> > *low − ;*
>
> **end**

Algorithm 1: FizzBuzz Algorithm

3) **Method 2 (Software2 method)** : Use a neural network to learn fizzbuzz algorithm.
3.1) **Data Pre-Processing**
Training data : binary data from 101 to 1000.
Test data : binary data from 1 to 100.

3.2) **Model Architecture**

 Model_1(
       (Layer_1): Linear(in_features=10, out_features=100, bias=True, activation = ReLU)
       (Classifier Layer): Linear(in_features=100, out_features=4, bias=True, activation = ReLU)
)

 Model_2(
       (Layer_1): Linear(in_features=10, out_features=100, bias=True, activation = ReLU)
       (Layer_2): Linear(in_features=100, out_features=10, bias=True, activation = ReLU)
       (Classifier Layer): Linear(in_features=10, out_features=4, bias=True, activation = ReLU)
)

Model_3(
       (Layer_1): Linear(in_features=10, out_features=128, bias=True, activation = ReLU)
       (Layer_2): Linear(in_features=128, out_features=64, bias=True, activation = ReLU)
       (Layer_2): Linear(in_features=64, out_features=32, bias=True, activation = ReLU)
       (Layer_2): Linear(in_features=32, out_features=16, bias=True, activation = ReLU)
       (Classifier Layer): Linear(in_features=16, out_features=4, bias=True, activation = ReLU)
)

Loss Function : Cross-Entropy Loss

3.3) **Model hyperparameters (1) :**

Optimizer	Adam
Learning Rate	0.01
Adam β_1	0.90
Adam β_1	0.98
Seed	100

Result

Model 1 result		
Batch Size	Epochs	Accuracy
32	200	94.00
32	300	97.00
32	**2000**	**98.00 (Best Model)**

Model 2 result		
Batch Size	Epochs	Accuracy
32	200	90.00
32	500	95.00

Model 3 result		
Batch Size	Epochs	Accuracy
32	200	79.00
32	500	81.00
32	1000	86.00

Model hyperparameter (2)

Optimizer	SGD
Learning Rate	0.01
Momentum β_1	0.90
Seed	42

Result

Model 1 result		
Batch Size	Epochs	Accuracy
32	200	89.00

For other model types similar results is observed.

The accuracy of the best model is **98.00**. It was able to identify every fizz, fizzbuzz and buzz integer except 2 (integer 20 and 80).