1. **Reformulation of Feature Requirement and spec into a technical document.**

This document will contain the following:

1. Formulas
2. Algorithm
3. Process Flow Diagram
4. Architectural diagrams

The formulas encapsulates the business logic behind the personal income tax.

The Algorithm shows/ explains how to use the formulas

The process flow graph will visually depict what the algorithm is trying to ach

1. On-boarding the feature into the System
2. Coding the feature

**CODING THE FEATURE**

**Creating database Entities**

- Payroll Entity

- Payslip Entity

- Payroll report

- Test

**Computational Service**

- service to compute CRA

- service to compute Taxable Income

- service to compute Tax Per Month

- Agregation Service

- Test

**Batch Processing**

- Execute payroll

- Save payroll

- Generate Report

- Test

**End Points**

- Activate Payrol for Organization

- Set payrol Parameters for all employees

- Set payrol Paramters for single employee

- Run new Payrol

- Payrol Summary (Gross payrol, employee size, number of runs)

- Fetch all payrols for belonging to an organization

- Fetch payslip by id

- Test

**FORMULAS AND EQUATIONS**

The following equations are a direct translations of the information contained in the **Personal Income Tax** document given earlier.

The formulas embed in them the procedures for computing Personal Income Tax.

1. **Consolidated Relief Allowance (CRA)**

*Given the gross amount* ***A***, the consolidated relief allowances is simply:

This can be simplified to:

1. **Tax Exemptions**

Tax exemptions is simply some percentage of your annual gross Salary the government frees from tax. These may include Pension, Housing Funds, Health insurance etc.

This can be modeled as follows:

Let the vectors:

Then we can compute the Exemption tax as the **Dot Product** vectors a and b:

**3. Monthly Tax Exemptions**

The monthly tax exemptions using the **Hadamard Product** (or element wise product) of vectors **a** and **b** as follows:

**4. Compute Taxable Income**

Taxable income is the actual gross salary amount from which the government is free to tax. This amount is the Annual Gross Salary less Exemptions.

The equation is:

Equation (4) computes taxable income given both **Tax Exemption** and **Consolidated Relief Allowance**, However, by expanding and simplification, you may also compute it using other means:

**ALGORITHMS**

**Algorithm 1: *Tax Per Month***

***Step 1:*** *Compute Taxable Income T*

***Step 2:*** *Compute tax using T as grossIncome*

*For each (taxAmount, percentage) in* ***taxTable****:*

*if taxAmount ≤ grossIncome:*

*annualTax += taxAmount ＊ percentage*

*grossIncome += grossIncome －taxAmount*

*else:*

*annualTax += grossIncome ＊ percentage*

***Step 3:*** *check if there is still more funds to tax*

*if grossIncome > 0:*

*annualTax += grossIncome ＊ 0.24*

*return annualTax*

**Algorithm 2: Salary Breakdown**

Let M = gross salary for the given month

***Step 1:*** *Subtract monthly tax T from M*

*Describe the tax deduction in the breakdown*

***Step 2:*** *Subtract monthly tax Exemptions R from M1*

*For each tax exemption r in* ***R****:*

*Describe r in the breakdown*

***Step 3:*** *Subtract / Add other salary addons (if any)*

*return breakdown*

**Algorithm 3: Payroll Execution Plan**

Given a payroll list P

While the organization still have funds in the wallet, do the following:

***Step 1:*** *generate* ***payslip*** *for user*

***Step 2:*** *Transfer gross Salary in pi from* ***orgWallet*** *to* ***userWallet***

***Step 3:*** *Schedule* ***userWallet*** *in p for* ***Bank Payment***

# Note: user will still have funds left in wallet after bank payment as a

# result of the fact only **netPay** is credited to the user

End

**SEQUENCE DIAGRAM**

Dashboard

Payroll Page

Run new Payroll

Set Payroll Params

Save Payroll

Report

Get Report of Payroll (e.g for the month of Feb. 2021)

Generated Report of Payroll (e.g for the month of Feb. 2021)

Activate Pension

Recomputed payslips

Activate NHF

Recomputed payslips

Activate NHF

Recomputed payslips

Execute Payroll

Generate Payroll

Activate Payroll

Login

**ARCHITECTURAL DIAGRAM**

**Payroll Core**

- Tax Execution

- Salary Breakdown

**Execution Plan**

**Report System**

**Repository**

( Data Storage )

PAYROLL SYSTEM

User

Finance

**ENTITY RELATIONSHIP DIAGRAM**

Payroll

Payslip

Salary Breakdown

Payroll Report

M

1

M

1

M

1

Payroll Beneficiary

1

1

**Report**

- id

- description

- dateGeneraed

**Payroll Beneficiary**

- id

- employeeWalletId

- bankName

- accountNum

- AccountName

- email

- phone

- optInPension

- optInNHF

- optInNHIF

**Salary Breakdown**

- id

- description

- amount

- payslipId

**Payslip**

- id

- payrollId

- paymentDate

- netPay

- grossPay

- beneficiaryId

**Payroll**

- id

- dateGenerated

- year

- month

- orgWalletId

- reportId

- executed