

# Assignment

Course Code: CSE 1203

Course Title: Object Oriented Programming

## A.2 MAJOR PROJECT – PAY SLIP GENERATION SYSTEM

### Learning Objectives

After going through this project, you will be able to

- ☐ Learn how real-world applications are developed using C++ programming
- ☐ Develop menu-driven applications
- ☐ Perform file handling operations such as read, write, append, and check for various I/O errors
- ☐ Represent the output in a formatted manner by using various I/O manipulators

### Application Overview

The objective of **Pay Slip Generation System (PSG System)** is to store the details of the employees of an organization and generate their pay slips. The organization employs two types of employees, viz., permanent and contractual. The **permanent** employees are entitled to dearness allowance (DA), house rent allowance (HRA), medical allowance (MA), provident fund deductions (PF), professional tax deductions (PTax) and income tax deductions (ITax) on their basic salary.

The **contractual** employees are entitled to a lump sum gross salary with professional and income tax deductions. The **PSG system** stores and retrieves the details of both types of employees, and also computes and generates their monthly pay slips. The system is capable of handling varying DA, HRA rates along with changes to the medical allowance and professional tax (if any).

## Key Elements

The class diagram for the PSG system application is shown below:

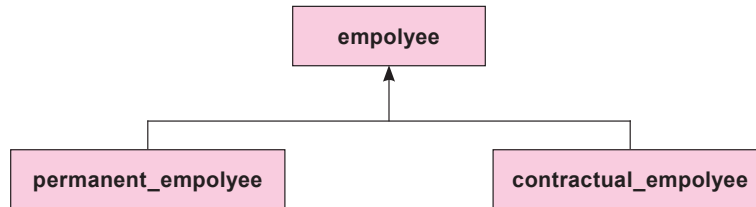


Table A.3 lists the various members of the employee class.

**Table A.3** *employee Class Members*

employee class		
Name	Type	Description
emp_no	Attribute	Unique ID of the employees
emp_name	Attribute	Name of employee
emp_add	Attribute	Address of employee
emp_dept	Attribute	Department of employee
emp_desg	Attribute	Designation of employee
getdata	Member function	Accept data from user
displaydata	Member function	Displays data as output

**Table A.4** *permanent\_employee Class Members*

permanent_employee class		
Name	Type	Description
emp_type	Attribute	Permanent employee
emp_basic	Attribute	Basic salary of employee
emp_da	Attribute	Dearness allowance
emp_hra	Attribute	House rent allowance
emp_ma	Attribute	Medical allowance
emp_pf	Member function	Provident fund
ptax	Member function	Professional tax
itax	Attribute	Income tax
gross	Attribute	Gross salary
Net	Attribute	Net salary
getdata	Member function	Accepts data from user
displaydata	Member function	Displays data
calculate	Member function	Calculates DA, HRA, PF, gross and net

(Contd.)

**Table A.3 (Contd.)**

<i>Name</i>	<i>Type</i>	<i>Description</i>
search	Friend function	Searches for permanent employee
store_in_file	Friend function	Stores details of employee in file
Generate_pay_slip	Friend function	Generates pay slip and stores it in file
Compute_OT	Friend function	Computes the overtime dues

Table A.5 lists the various members of the contractual\_employee class:

**Table A.5 contractual\_employee Class Members**

<b>contractual_employee class</b>		
<i>Name</i>	<i>Type</i>	<i>Description</i>
emp_type	Attribute	Contractual employee
ptax	Member function	Professional tax
itax	Attribute	Income tax
gross	Attribute	Gross salary
net	Attribute	Net salary
getdata	Member function	Accepts data from user
displaydata	Member function	Displays data
calculate	Member function	Calculates net by deducting taxes
search	Friend function	Searches for contractual employee
store_in_file	Friend function	Stores details of employee in file
Generate_pay_slip	Friend function	Generates pay slip and stores it in file
Compute_OT	Friend function	Computes the overtime dues

## Program Logic

### Salary Calculation for Permanent Employees

The gross salary of every permanent employee has the following components:

1. Basic
2. Dearness allowance: Calculated as a pre-set percentage of basic
3. House rent allowance: Calculated as a pre-set percentage of basic
4. Medical allowance: A fixed pre-set lump sum amount

The net salary is computed by subtracting from the gross the following:

- Provident fund: Calculated as 12% of (Basic + DA)
- Professional tax: Fixed amount
- Income tax: Fixed amount (The tax computations are usually finalized at the end of each financial year)

### *Salary Calculation for Permanent Employees*

Every contractual employee is entitled to receive a fixed gross salary.

The net salary is computed by subtracting from the gross the following:

- Professional tax: Fixed amount
- Income tax: Fixed amount (The tax computations are usually finalized at the end of every financial year)

### **Overtime Dues Calculations for all Employees**

The employees are entitled to receive overtime allowance which has been fixed at the rate of INR 400 per hour. The overtime is thus, calculated in batch mode after accepting the number of overtime hours for each employee as input from the user of the system.

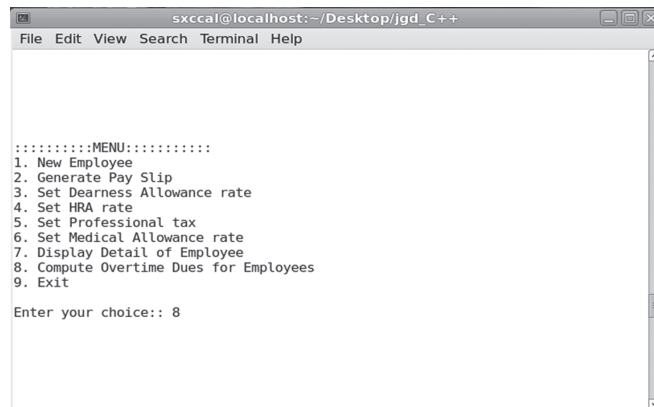
### **Application Code**

The following is the code for the PSG system. This code has been developed in the Linux environment. Thus, some commonly used functions such as `getch()`, `clrscr()`, etc. have not been used. The `getline()` function calls may require the buffer to be flushed prior to being called.

## Application Output

The following is a series of screenshots depicting how the PSG system functions.

### Main Menu

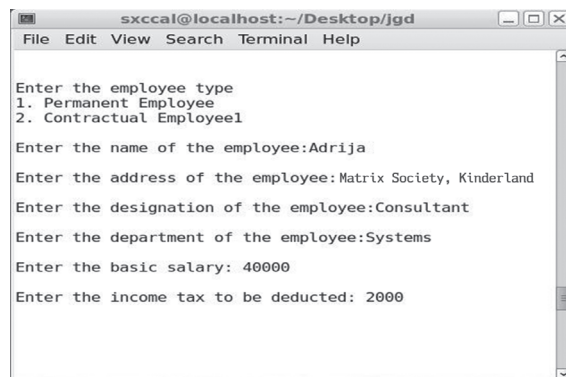


```
sxccal@localhost:~/Desktop/jgd_C++
File Edit View Search Terminal Help

:~::~:MENU::~:~::~:
1. New Employee
2. Generate Pay Slip
3. Set Dearness Allowance rate
4. Set HRA rate
5. Set Professional tax
6. Set Medical Allowance rate
7. Display Detail of Employee
8. Compute Overtime Dues for Employees
9. Exit

Enter your choice:: 8
```

### Entering details of permanent employee (Option 1 of main menu)

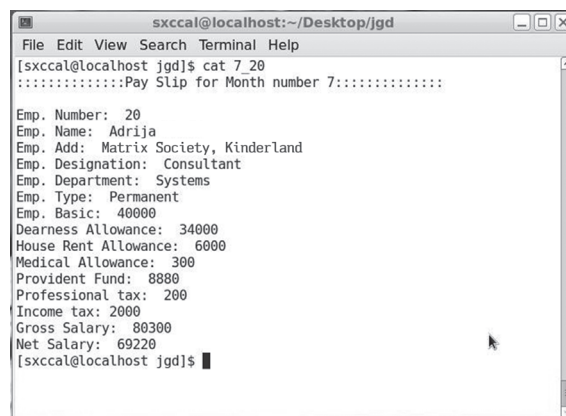


```
sxccal@localhost:~/Desktop/jgd
File Edit View Search Terminal Help

Enter the employee type
1. Permanent Employee
2. Contractual Employee1

Enter the name of the employee:Adrija
Enter the address of the employee:Matrix Society, Kinderland
Enter the designation of the employee:Consultant
Enter the department of the employee:Systems
Enter the basic salary: 40000
Enter the income tax to be deducted: 2000
```

### Pay slip generated and stored for permanent employee (Option 2 of main menu)

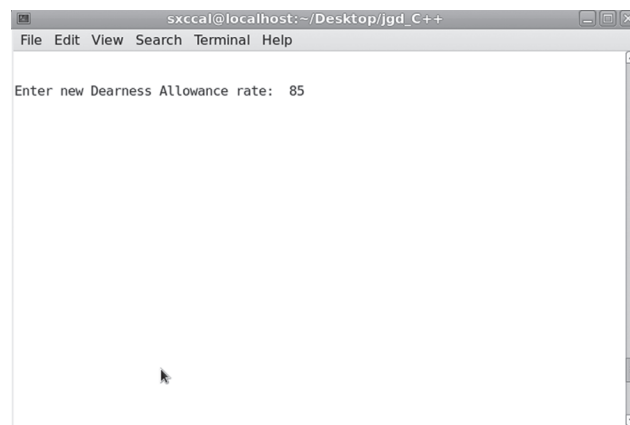


```
sxccal@localhost:~/Desktop/jgd
File Edit View Search Terminal Help

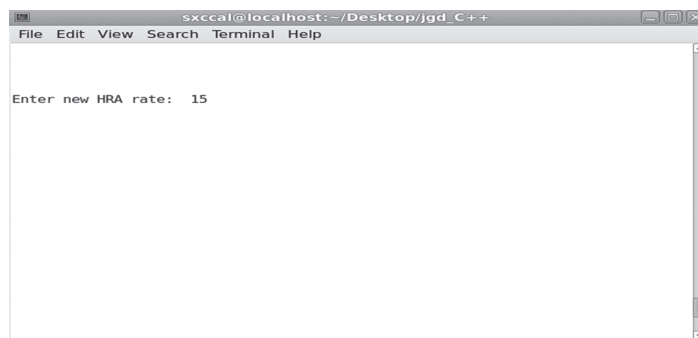
[sxccal@localhost jgd]$ cat 7_20
:~::~:Pay Slip for Month number 7::~:~::~:

Emp. Number: 20
Emp. Name: Adrija
Emp. Add: Matrix Society, Kinderland
Emp. Designation: Consultant
Emp. Department: Systems
Emp. Type: Permanent
Emp. Basic: 40000
Dearness Allowance: 34000
House Rent Allowance: 6000
Medical Allowance: 300
Provident Fund: 8800
Professional tax: 200
Income tax: 2000
Gross Salary: 80300
Net Salary: 69220
[sxccal@localhost jgd]$
```

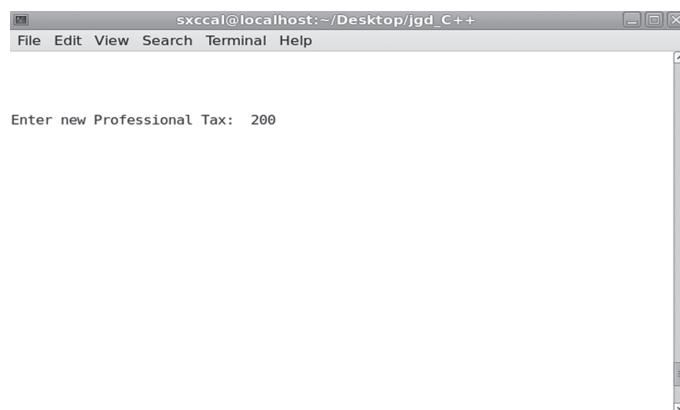
*Setting the Dearness Allowance Rate (Option 3 of main menu)*



*Setting the HRA rate (Option 4 of main menu)*



*Setting the Professional Tax amount (Option 5 of main menu)*



*Setting the medical allowance amount (Option 6 of main menu)*

```
sxccal@localhost:~/Desktop/jgd_C++
File Edit View Search Terminal Help
Enter new Medical Allowance: 300
```

*Displaying the details of an employee (Option 7 of main menu)*

```
sxccal@localhost:~/Desktop/jgd_C++
File Edit View Search Terminal Help
Enter Employee no.: 2

Enter Employee type:
1. Permanent Employee
2. Contractual Employee1

Emp. No.: 2
Name: Reema Lagoo
Address: Mumbai
Designation: Editor
Department: Publishing
Employee type: Permanent
Basic: 40000
Dearness Allowance: 34000
HRA: 6000
Medical Allowance: 300
PF:8880
Professional tax: 200
Income tax: 2500
Gross Salary: 80300

Net Salary: 68720
```

*Overtime dues (Option 8 of main menu)*

```
sxccal@localhost:~/Desktop/jgd_C++
File Edit View Search Terminal Help

The Overtime Dues for the employees are as follows:

Emp No.    Emp. Name                Overtime Dues
1          Rajiv Karmakar            800
2          Reema Lagoo               1200
3          Anil Gomes                1600
4          Sanjiv Bansal             2000
5          Vaibhav Goenka            2400
6          Gayatri Rao               2000
7          Harish Dalmiya            1600
```