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SPC AAT Report on

TITLE

RECEIPT FORMATION

Bachelor of Engineering
in
Artificial Intelligence and Machine Learning

Submitted by:

DIVYA S

JAHNAVI R

Department of Artificial Intelligence and Machine Learning
B.M.S College of Engineering
Bull Temple Road, Basavanagudi, Bangalore 560 019
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B.M.S COLLEGE OF ENGINEERING
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING



DECLARATION

We, DIVYA S and JAHNAVI R, students of 1st Semester, B.E, Department of AIML, BMS College of Engineering, Bangalore, hereby declare that, this AAT Project entitled "RECEIPT FORMATION" has been carried out in Department of AIML, BMS College of Engineering, Bangalore during the academic semester Sept 2025 – Jan 2026. We also declare that to the best of our knowledge and belief, the AAT Project report is not from part of any other report by any other students.

Student Name

1. DIVYA S

2. JAHNAVI R

Student Signature

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CERTIFICATE

This is to certify that the AAT Project titled “RECEIPT FORMATION” has been carried out by DIVYA S (1BM25AI084-T) and JAHNAVI R (1BM25AI349-T) during the academic year 2025-2026.

Signature of the Faculty in Charge

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1. INTRODUCTION

The Receipt Generation System is a console-based application designed and implemented using the C programming language for an electronics sales and service organization called Tech World Electronics & Service Hub. The primary aim of this program is to computerize and simplify the billing process for customers who purchase electronic products, avail technical services, or choose both options together. The program provides a menu-driven interface that enables the user to select the type of receipt to be generated. Based on the selected option, the program accepts customer details, calculates the cost of products and services, applies applicable discounts, and computes the Goods and Services Tax (GST). It then generates a neatly formatted receipt displaying all transaction details in a clear and readable manner.

This program makes effective use of structured programming principles to ensure modularity, clarity, and ease of understanding. By automating calculations and minimizing manual errors, the system improves accuracy and efficiency in billing operations. The project also highlights the practical application of fundamental programming concepts such as arrays, conditional statements, loops, and arithmetic operations. Overall, this program serves as a simple yet effective example of how C programming can be used to develop real-world applications for retail and service-based environments.

Concepts Used in the Program

1. Variables and Data Types

- The program uses integer (int) variables to store menu choices and loop counters.
- Floating-point (float) variables are used to store prices of electronic items, service charges, GST, discounts, and total amounts.
- Character (char) arrays are used to store textual data such as customer names, product names, and service descriptions.
- Proper selection of data types ensures accurate calculations and efficient memory usage.

2. Arrays

- Arrays are used to store multiple related values under a single variable name.
- Character arrays store names of electronic products and technical services.
- Float arrays store the corresponding service charges.
- Arrays make the program more organized and reduce repetitive code.
- They also allow easy access to multiple values using loop statements.

3. Conditional Statements

- The program uses if, else if, and else statements to control program flow.
- User input is checked to determine which type of receipt should be generated.
- Each condition executes a different block of code based on the selected option.
- An additional condition is used to handle invalid menu choices.
- Conditional statements ensure correct decision-making within the program.

4. Looping Statements

- for loops are used to iterate through arrays.
- The loops calculate the total service cost by adding all service charges.
- They are also used to display each service and its charge in the receipt.
- Looping reduces redundancy and improves code readability.
- It makes the program easier to modify and extend.

5. Input and Output Functions

- The scanf() function is used to accept user input such as menu choice and customer name.
- The printf() function is used to display menus, messages, and receipts.
- Formatted output is used to present data in a structured and readable format.
- Input and output functions make the program interactive and user-friendly.

6. Arithmetic Operations

- Arithmetic operators such as addition, subtraction, multiplication, and division are used.
- Subtotal is calculated by adding prices of items or services.
- Discount is applied based on predefined conditions.
- GST is calculated at 18% of the taxable amount.
- Final and grand totals are computed accurately using arithmetic operations.

7. Ternary Operator

- The ternary operator is used to apply discount conditions.

Receipt Formation

- It checks whether the total service cost exceeds a certain limit.
- Based on the condition, the discount is either applied or set to zero.
- This reduces the number of lines of code and improves efficiency.

8. Formatted Output

- Format specifiers such as %.2f are used to display monetary values.
- This ensures that all currency values are shown up to two decimal places.'

2.ALGORITHM

Step 1: Start the program

Step 2: Declare required variables

- Integer variable for choice
- Character arrays for customer name, product name
- Float variables for price, subtotal, GST, discount, total amount
- Arrays for service names and service charges (for service receipt)

Step 3: Display header information

- Print shop name, address, and contact details

Step 4: Display the main menu

1. Electronics Purchase Receipt
2. Technical Service Receipt
3. Combined Receipt
4. Exit

Step 5: Read user choice

- Accept the user's choice using scanf

Step 6: Use switch statement to process choice

Step 7: If choice = 1 (Electronics Purchase Receipt)

1. Read customer name
2. Initialize electronics products (Laptop, Headset, Charger) and their prices

Receipt Formation

3. Calculate:
 - Subtotal = sum of product prices
 - GST = 18% of subtotal
 - Total Amount = subtotal + GST
4. Display electronics receipt with:
 - Customer name
 - Product details
 - Subtotal, GST, and total amount

Step 8: If choice = 2 (Technical Service Receipt)

1. Read customer name
2. Initialize services and service charges
3. Calculate:
 - Total service cost
 - Discount (10% if total > 2000)
 - Amount after discount
 - GST = 18%
 - Final amount
4. Display service receipt with:
 - Service list
 - Charges
 - Discount, GST, and final amount

Step 9: If choice = 3 (Combined Receipt)

1. Read customer name
2. Calculate electronics subtotal, GST, and total
3. Calculate service subtotal, discount, GST, and total
4. Calculate grand total = electronics total + service total
5. Display combined receipt with all totals

Receipt Formation

Step 10: If choice = 4

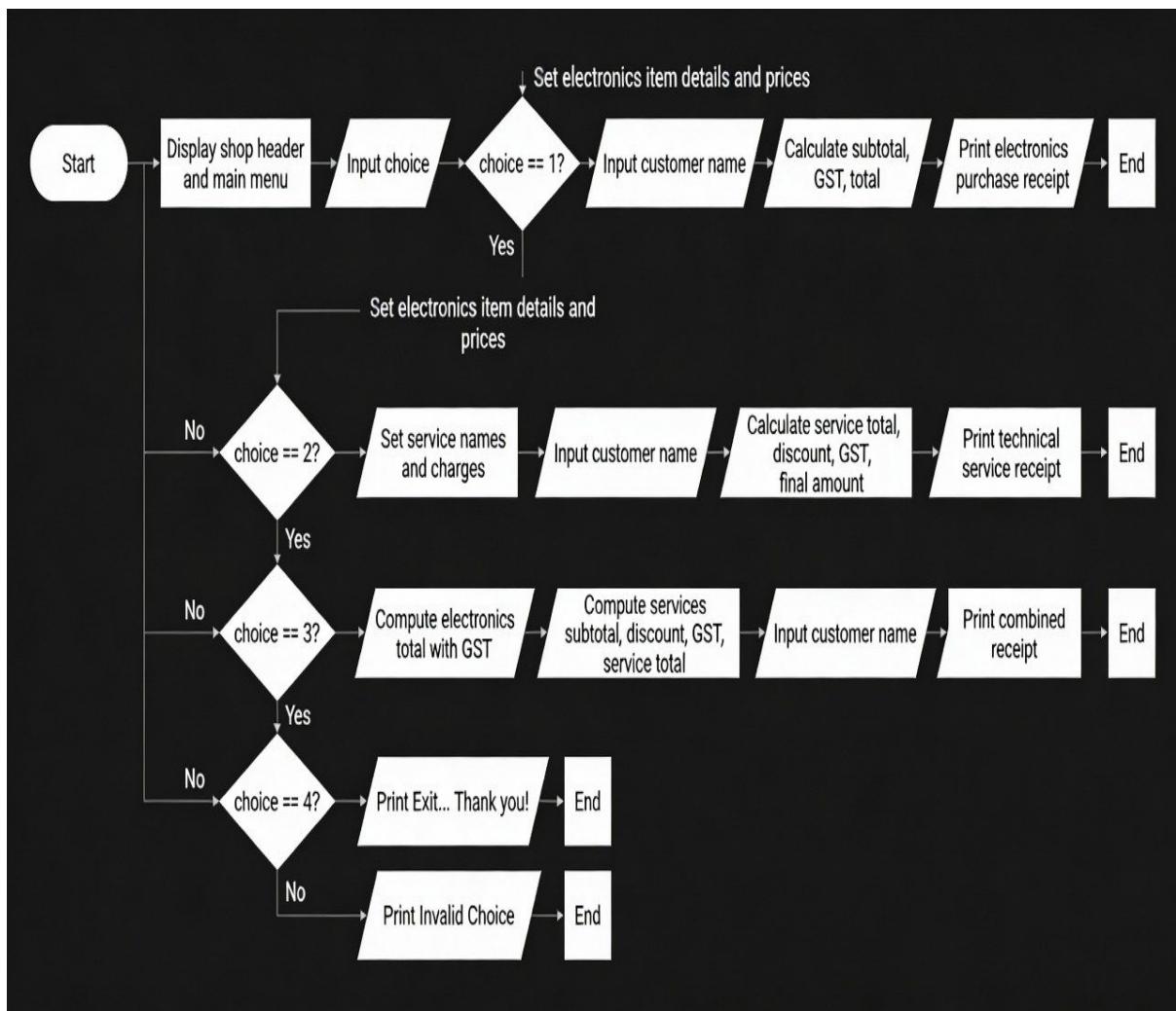
- Display exit message

Step 11: If invalid choice

- Display error message

Step 12: End the program

3.FLOWCHART



1. System Overview The flowchart presented in Figure illustrates the logical control flow for an Electronics Shop and Technical Service Management System. The program is designed as a menu-driven application that allows the user to navigate between distinct operational modules: purchasing electronics, processing technical services, generating combined receipts, or exiting the application.

2. Process Initialization The process begins at the Start terminator. The system immediately executes the "Display shop header and main menu" process, presenting the available options to the user. Subsequently, the system prompts for user input via the "Input choice" operation, storing the user's selection in a variable to determine the subsequent program path.

3. Conditional Logic and Branching The core logic relies on a cascading decision structure (If-Else-If ladder) to evaluate the user's input:

- Option 1: Electronics Purchase If the user selects **choice == 1**, the system proceeds to process an electronics sale. It sets the item details and prices, requests the customer's name, and performs calculations to determine the subtotal, Goods and Services Tax (GST), and the grand total. Finally, it generates an electronics purchase receipt before terminating the process.
- Option 2: Technical Service If the user selects **choice == 2**, the system initiates the service module. It defines service names and charges, inputs the customer's name, and performs specific calculations regarding service totals, applicable discounts, GST, and the final billable amount. A technical service receipt is then printed.
- Option 3: Combined Receipt If **choice == 3** is selected, the system aggregates data from both the electronics and service modules. It computes the total for electronics (with GST) and the total for services (including discounts and GST). The user is prompted for their name, and a comprehensive combined receipt is generated.
- Option 4: System Termination If **choice == 4** is selected, the system acknowledges the exit request by printing a "Thank you" message and gracefully terminates the program.

4. Error Handling and Termination If the input does not match any valid options (1 through 4), the logic flows to the default "No" branch. The system outputs an "Invalid Choice" error message to alert the user. All logical paths ultimately converge at the End terminator, ensuring the program closes correctly regardless of the path taken.

4.SOURCE CODE

```
#include <stdio.h>

int main()
{
    int choice;
    char customerName[50];

    printf("=====\\n");
    printf(" TECH WORLD ELECTRONICS & SERVICE HUB\\n");
    printf(" #131, Brigade Road, Bengaluru - 560025 | Ph: +91 9876543210\\n");

    printf("=====\\n");
    printf("\n RECEIPT GENERATION SYSTEM - MAIN MENU\\n");
    printf(" -----\\n");
    printf(" 1. Electronics Purchase Receipt\\n");
    printf(" 2. Technical Service Receipt\\n");
    printf(" 3. Combined Receipt (Both)\\n");
    printf(" 4. Exit\\n");
    printf("Enter your choice: ");
    scanf("%d", &choice);

    if (choice == 1)
```

Receipt Formation

```
{  
    char laptopModel[] = "Dell Inspiron 3520";  
    char headsetModel[] = "JBL Tune 510BT";  
    char chargerModel[] = "Samsung 25W Fast Charger";  
  
    float priceLaptop = 75000.00;  
    float priceHeadset = 5500.00;  
    float priceCharger = 2500.00;  
  
    float subtotal, gst, total;  
  
    printf("\nEnter Customer Name: ");  
    getchar();  
    fgets(customerName, sizeof(customerName), stdin);  
    subtotal = priceLaptop + priceHeadset + priceCharger;  
    gst = subtotal * 0.18;  
    total = subtotal + gst;  
  
    printf("\n----- ELECTRONICS PURCHASE RECEIPT -----\\n");  
    printf("Customer Name : %s\\n", customerName);  
  
    printf("Laptop (%s) : Rs %.2f\\n", laptopModel, priceLaptop);  
    printf("Headset (%s) : Rs %.2f\\n", headsetModel, priceHeadset);  
    printf("Charger (%s) : Rs %.2f\\n", chargerModel, priceCharger);  
    printf("-----\\n");  
    printf("Subtotal : Rs %.2f\\n", subtotal);  
    printf("GST (18%%) : Rs %.2f\\n", gst);  
    printf("TOTAL AMOUNT : Rs %.2f\\n", total);  
    printf("-----\\n");
```

Receipt Formation

```
{  
  
else if (choice == 2)  
{  
    char services[4][30] = {  
        "Screen Replacement",  
        "Battery Change",  
        "Software Installation",  
        "Cleaning Service"};  
  
    float serviceCharges[4] = {4500, 1800, 1500, 1300};  
    float totalServiceCost = 0, discount, gst, finalAmount;  
  
    printf("\nEnter Customer Name: ");  
  
    getchar();  
    fgets(customerName, sizeof(customerName), stdin);  
    for (int i = 0; i < 4; i++)  
        totalServiceCost += serviceCharges[i];  
  
    discount = (totalServiceCost > 2000) ? totalServiceCost * 0.10 : 0;  
    gst = (totalServiceCost - discount) * 0.18;  
    finalAmount = totalServiceCost - discount + gst;  
  
    printf("\n----- TECHNICAL SERVICE RECEIPT -----\\n");  
    printf("Customer Name : %s\\n", customerName);  
    for (int i = 0; i < 4; i++)  
        printf("%d. %-25s Rs %.2f\\n", i + 1, services[i], serviceCharges[i]);  
  
    printf("-----\\n");
```

Receipt Formation

```
printf("Service Total : Rs %.2f\n", totalServiceCost);
printf("Discount (10%%) : Rs %.2f\n", discount);
printf("GST (18%%) : Rs %.2f\n", gst);
printf("FINAL AMOUNT : Rs %.2f\n", finalAmount);
printf("-----\n");
}

else if (choice == 3)
{
    float elecTotal = (75000 + 5500 + 2500) * 1.18;
    float serviceCharges[4] = {4500, 1800, 1500, 1300};
    float serviceSubtotal = 0;

    printf("\nEnter Customer Name: ");
    getchar();
    fgets(customerName, sizeof(customerName), stdin);
    for (int i = 0; i < 4; i++)
        serviceSubtotal += serviceCharges[i];

    float serviceDiscount = serviceSubtotal * 0.10;
    float serviceTotal = (serviceSubtotal - serviceDiscount) * 1.18;

    printf("\n===== COMBINED RECEIPT =====\n");
    printf("Customer Name : %s\n", customerName);
    printf("Electronics Total : Rs %.2f\n", elecTotal);
    printf("Service Total : Rs %.2f\n", serviceTotal);
    printf("GRAND TOTAL : Rs %.2f\n", elecTotal + serviceTotal);
    printf("=====\\n");
}
```

Receipt Formation

```
else if (choice == 4)
{
    printf("\nExit... Thank you!\n");
}
else
{
    printf("\nInvalid Choice!\n");
}
return 0; }
```

5.RESULTS

OUTPUT 1:

```
=====
TECH WORLD ELECTRONICS & SERVICE HUB
#131, Brigade Road, Bengaluru - 560025 | Ph: +91 9876543210
=====

RECEIPT GENERATION SYSTEM - MAIN MENU
-----
1. Electronics Purchase Receipt
2. Technical Service Receipt
3. Combined Receipt (Both)
4. Exit
Enter your choice: 1

Enter Customer Name: Steven Jhon

----- ELECTRONICS PURCHASE RECEIPT -----
Customer Name : Steven Jhon

Laptop (Dell Inspiron 3520) : Rs 75000.00
Headset (JBL Tune 510BT) : Rs 5500.00
Charger (Samsung 25W Fast Charger) : Rs 2500.00

-----
Subtotal : Rs 83000.00
GST (18%) : Rs 14940.00
TOTAL AMOUNT : Rs 97940.00
-----
```

Output Description: Electronics Purchase Receipt Generation

1. Main Menu and User Selection The output screen begins by displaying the standard organization header for "TECH WORLD ELECTRONICS & SERVICE HUB," followed by the "Receipt Generation System - Main Menu." The menu lists four distinct operations: Electronics Purchase Receipt, Technical Service Receipt, Combined Receipt, and Exit. In this instance, the user inputs **1** at the "Enter your choice" prompt, initiating the electronics purchase module.

2. Data Input Upon selecting the first option, the system prompts the user to "Enter Customer Name." The user inputs "Steven Jhon," which is captured by the system for inclusion in the final receipt.

3. Itemized Billing Display The system proceeds to generate the "ELECTRONICS PURCHASE RECEIPT." It lists the customer's name and details the specific electronic items purchased along with their unit prices:

- Laptop (Dell Inspiron 3520): Rs 75,000.00
- Headset (JBL Tune 510BT): Rs 5,500.00
- Charger (Samsung 25W Fast Charger): Rs 2,500.00

4. Financial Calculations The final section of the output demonstrates the system's calculation logic:

- Subtotal: The system sums the individual item prices to arrive at a subtotal of Rs 83,000.00.
- GST Calculation: A Goods and Services Tax (GST) of 18% is applied to the subtotal, resulting in a tax amount of Rs 14,940.00.
- Total Amount: The final payable amount is computed by adding the subtotal and the GST, resulting in a distinct "TOTAL AMOUNT" of Rs 97,940.00.

OUTPUT 2:

```
=====
TECH WORLD ELECTRONICS & SERVICE HUB
#131, Brigade Road, Bengaluru - 560025 | Ph: +91 9876543210
=====
```

RECEIPT GENERATION SYSTEM - MAIN MENU

- ```

1. Electronics Purchase Receipt
2. Technical Service Receipt
3. Combined Receipt (Both)
4. Exit
```

Enter your choice: 2

Enter Customer Name: Steven Jhon

```
----- TECHNICAL SERVICE RECEIPT -----
Customer Name : Steven Jhon
```

- ```
1. Screen Replacement      Rs 4500.00
2. Battery Change          Rs 1800.00
3. Software Installation    Rs 1500.00
4. Cleaning Service        Rs 1300.00
```

Service Total : Rs 9100.00

Discount (10%) : Rs 910.00

GST (18%) : Rs 1474.20

FINAL AMOUNT : Rs 9664.20

Output Description: Technical Service Receipt Generation

1. Module Selection and Input Following the display of the main menu, the user selects option **2** to initiate the Technical Service module. The system then prompts for the client's identification, where the user inputs the customer name "Steven Jhon."
2. Service Itemization The system generates a detailed "TECHNICAL SERVICE RECEIPT" that lists the specific maintenance and repair tasks performed. The receipt enumerates the following services with their respective costs:
 - Screen Replacement: Rs 4,500.00
 - Battery Change: Rs 1,800.00
 - Software Installation: Rs 1,500.00
 - Cleaning Service: Rs 1,300.00
3. Financial Computation and Logic The final section of the output highlights the system's ability to handle discounts and taxation logic sequentially:
 - Service Total: The individual service costs are aggregated to form a base total of Rs 9,100.00.
 - Discount Application: A promotional discount of 10% is calculated on the service total, resulting in a deduction of Rs 910.00.
 - Taxation (GST): The system calculates an 18% Goods and Services Tax (GST) amounting to Rs 1,474.20. This tax is computed on the discounted value (the base total minus the discount), demonstrating the system's adherence to standard billing practices.
 - Final Amount: The final billable amount is derived by adding the GST to the discounted subtotal, resulting in a total payable amount of Rs 9,664.20.

OUTPUT 3:

```
=====
TECH WORLD ELECTRONICS & SERVICE HUB
#131, Brigade Road, Bengaluru - 560025 | Ph: +91 9876543210
=====

RECEIPT GENERATION SYSTEM - MAIN MENU
-----
1. Electronics Purchase Receipt
2. Technical Service Receipt
3. Combined Receipt (Both)
4. Exit
Enter your choice: 3

Enter Customer Name: Steven Jhon

===== COMBINED RECEIPT =====
Customer Name      : Steven Jhon

Electronics Total  : Rs 97940.00
Service Total     : Rs 9664.20
GRAND TOTAL       : Rs 107604.20
=====
```

Output Description: Combined Receipt Generation

1. Module Activation and Input From the main menu, the user selects option **3** to generate a "Combined Receipt (Both)." This module is designed to consolidate transactions for customers who have utilized both the retail and service departments. The system prompts for the customer's name, where the user inputs "Steven Jhon."
2. Aggregated Financial Summary Unlike the detailed itemized lists in the previous outputs, the "COMBINED RECEIPT" provides a high-level financial summary. It retrieves and displays the calculated final totals from the respective subsystems:

Receipt Formation

- Electronics Total: The system displays Rs 97,940.00, which corresponds to the final amount calculated in the Electronics Purchase module (Output 1).
- Service Total: The system displays Rs 9,664.20, which corresponds to the final billable amount from the Technical Service module (Output 2).

3. Cumulative Grand Total The final operation performed by this module is the summation of the departmental totals. The system adds the electronics total and the service total to compute a cumulative GRAND TOTAL of Rs 107,604.20. This demonstrates the system's capability to store variables globally or pass data effectively between different logical blocks to produce a unified final bill.

OUTPUT 4:

```
=====
TECH WORLD ELECTRONICS & SERVICE HUB
#131, Brigade Road, Bengaluru - 560025 | Ph: +91 9876543210
=====

RECEIPT GENERATION SYSTEM - MAIN MENU
-----
1. Electronics Purchase Receipt
2. Technical Service Receipt
3. Combined Receipt (Both)
4. Exit
Enter your choice: 4

Exit... Thank you!
```

Output Description: System Termination

1. Menu Navigation and Exit Selection The final operational path demonstrated is the controlled termination of the application. Upon reviewing the "Receipt Generation System - Main Menu," the user determines that no further transactions are required. Consequently, the user inputs **4** at the "Enter your choice" prompt to select the "Exit" option.
2. Graceful Shutdown Unlike a forced closure, this option triggers a programmed exit sequence. The system acknowledges the user's decision by displaying a courteous closing message: "Exit... Thank you!". Immediately following this output, the program halts execution, returning control to the operating system. This ensures that all processes are completed and the application closes without errors.

REFERENCES

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