

(SECJ1013) PROGRAMMING TECHNIQUE 1

SEM 1, SESSION 2023/2024

LAB EXERCISE 3 (4%)

INSTRUCTIONS TO THE STUDENTS

- This exercise must be done **individually**.
- Any form of plagiarism is **NOT ALLOWED**. Students who copied other students' assignments will get **ZERO** marks (both parties, students who copied, and students who shared their work).

SUBMISSION PROCEDURE

- Please submit this exercise no later than **December 21, 2023, Thursday (1 PM MYT)**.
- Only hardcopy is accepted for this submission with handwriting (at my office – n28a, level 2, room 02-31-01).

Fill your information here:

Name	
Matric Number	
Year / Course	
Section	

SET 1

The following program code has errors. Locate the errors.

Line	C++ Codes
1	#include <iostream>
2	using namespace std;
3	
4	// function prototypes
5	void display_Question()
6	void yes_No()
7	int get_Status()
8	
9	// start main function
10	int main() {
11	char red_zone, close_contact, fever;
12	// two possible character values only:
13	// 'y' -> yes, 'n' -> no
14	
15	int status;
16	// 0 -> GREEN, 1 -> YELLOW, 2 -> ORANGE, 3 -> RED
17	
18	for (int i = 1; i < 3; i++) {
19	display_question(i);
20	if (i = 1)
21	yes_No(red_zone);
22	// set red_zone either 'y' or 'n'
23	else if (i = 2)
24	yes_No(close_contact);
25	// set close_contact either 'y' or 'n'
26	else
27	yes_No(fever);
28	// set fever either 'y' or 'n'
29	}
30	
31	

```

32      // get risk status based on red_zone,
      close_contact, fever parameters
      status = get_Status(red_zone, close_contact,
33      fever);
34      cout << "Your Covid-19 risk status is ";
35      while (status) {
36          if status = 0: cout << "GREEN"; break;
37          if status = 1: cout << "YELLOW"; break;
38          if status = 2: cout << "ORANGE";
39          if status = 3: cout << "RED";
40      }
41      cout << "\n";
42      return 0;
43  }
44
45  // start new user-defined functions
46  void display_Question(char q) {
47      switch (q)
48          case 1:
49              cout << "Living in red zone?\n";
50              break;
51          case 2:
52              cout << "Have a close contact with
Covid-19 patient?\n";
53              break;
54          case 3:
55              cout << "Body temperature >= 38 degrees
Celcius?\n";
56          } return q;
57  }
58
59  void yes_No(char ans) {
60      do {
61          cout << "Please enter your answer (y / n): ";

```

62	cin << ans;
63	} while (ans = 'n' & ans = 'y');
64	cout << '\n';
65	}
66	
67	int get_Status(char rz, char cc, char f) {
68	int s = 0;
69	if (rz = 'y') s++;
70	if (cc = 'y') s++;
71	if (f = 'y') s++;
72	return s;
	}

Fill in the following table by stating the line number and write the correct statement with the reason(s).

Line Number	Correct Statement with the reason(s)

Line Number	Correct Statement with the reason(s)

SET 2

Complete the code segments in the program below.

1. Task 1:

Write a function named **setType** with the parameter of car type variable, which prompts the user to enter a car type either "**sedan**" or "**mpv**" and continues to do so in a loop until the entered type is either "**sedan**" or "**mpv**".

2. Task 2:

Write a function named **setPackage** with the parameter of car wash service package, which displays a menu with three options for car wash service packages: **Basic (1)**, **Deluxe (2)**, and **Premium (3)**.

It prompts the user to choose a package by entering the corresponding number (**1**, **2**, or **3**). The loop continues until a valid package number (between **1** and **3** inclusive) is entered by the user.

3. Task 3:

Write a function named **wash** with the parameter of car type variable, which calculates the wash service charge based on the type of car.

If the car type is "**mpv**", the charge is calculated as **1.2 times** the constant **WASH**; otherwise, the charge is equal to the constant **WASH**.

The calculated charge is then displayed, and the function returns the computed charge.

4. Task 4:

Write a function named **vacuum** with the parameter of car type variable, which calculates the vacuum service charge based on the type of car.

If the car type is "**mpv**", the charge is calculated as **1.05 times** the constant **VACUUM**; otherwise, the charge is equal to the constant **VACUUM**.

The calculated charge is then displayed, and the function returns the computed charge.

5. Task 5:

Write a function named **polish** with the parameter of car type variable, which calculates the polish service charge based on the type of car.

If the car type is "**mpv**", the charge is calculated as **1.2 times** the constant **POLISH**; otherwise, the charge is equal to the constant **POLISH**.

The calculated charge is then displayed, and the function returns the computed charge.

6. Task 6:

List all function prototypes.

7. Task 7:

- (i) Call the functions from Task 1 until Task 5 in the **main** function.
- (ii) **totalCharge** is the variable to hold the total service charge based on different wash service package with different car type ("**sedan**" or "**mpv**").

(Note for wash service packages: Task 3 for **Basic**, Task 4 for **Deluxe**, and Task 5 for **Premium**)

- (iii) Print out the final total service charge.

8. Task 8:

You must ensure your program fulfil the following criteria:

- The program is able to run.
- The program uses an appropriate structure for the program (e.g. all required header files are included, the program is properly written, proper indentation, etc.).

Sample Execution Output

```
Enter car type (sedan/mpv): sedan
1. Basic
2. Deluxe
3. Premium
Choose wash service package (1/2/3): 1
Wash service charge is 10
Total service charge is 10
-----
```

```
Enter car type (sedan/mpv): sedan
1. Basic
2. Deluxe
3. Premium
Choose wash service package (1/2/3): 2
Vacuum service charge is 7
Total service charge is 7
-----
```



```
Enter car type (sedan/mpv): sedan
```

- 1. Basic
- 2. Deluxe
- 3. Premium

```
Choose wash service package (1/2/3): 3
```

```
Polish service charge is 15
```

```
Total service charge is 15
```

```
-----
```

```
Enter car type (sedan/mpv): mpv
```

- 1. Basic
- 2. Deluxe
- 3. Premium

```
Choose wash service package (1/2/3): 1
```

```
Wash service charge is 12
```

```
Total service charge is 12
```

```
-----
```

```
Enter car type (sedan/mpv): mpv
```

- 1. Basic
- 2. Deluxe
- 3. Premium

```
Choose wash service package (1/2/3): 2
```

```
Vacuum service charge is 7.35
```

```
Total service charge is 7.35
```

```
-----
```

```
Enter car type (sedan/mpv): mpv
```

- 1. Basic
- 2. Deluxe
- 3. Premium

```
Choose wash service package (1/2/3): 3
```

```
Polish service charge is 18
```

```
Total service charge is 18
```

```
-----
```

Note: show user's input.

```

#include <iostream>
#include <string>
using namespace std;

// constants with the associated values
#define WASH 10.0 // the price of WASH service charge
#define VACUUM 7.0 // the price of VACUUM service charge
#define POLISH 15.0 // the price of POLISH service charge

// Task 6: List all function prototypes.


// Task 7: (i) Call the functions from Task 1 until Task 5.
int main() {
    string carType; // car type variable
    int wsPkg; // car wash service package
    float totalCharge = 0; // total service charge based on
different wash service package with different car type

    // call setType function with the parameter carType

    // call setPackage function with the parameter wsPkg

```

```
    // Task 7: (ii) totalCharge is the variable to hold the
total service charge based on different wash service package
with different car type (sedan or mpv).
```

```
    switch (wsPkg) {
```

```
    }
```

```
    cout << endl;
```

```
    cout << "Total service charge is " << totalCharge;
```

```
    return 0;
```

```
}
```

```
// Task 1: Function to set car type
```

```
void setType(string &type) {
```

```
    cout << endl;
```

```
}
```

```
// Task 2: Function to set wash service package
void setPackage(int &pkg) {

    cout << endl;
}

// Task 3: Function to determine exterior wash service charge
based on car type
float wash(string type) {

}

// Task 4: Function to determine interior vacuum service
charge based on car type
float vacuum(string type) {
```

```
}
```

```
// Task 5: Function to determine exterior polish service  
charge based on car type
```

```
float polish(string type) {
```

```
}
```