

Practical 3 (due 2023-03-10 @ 09:00)

This exercise aims to demonstrate how useful automated code generators can be as a tutor. The practical also demonstrates what plagiarism is. Even though we encourage students NOT to use code generators like ChatGPT to complete assessments, this exercise demonstrates that code generators can play a vital role in learning new technologies, languages or systems.

General guidelines

This practical will further refine your use of flow control constructs. Please note that you **must** use **ChatGPT** to complete this practical assignment and do the following:

- Even though ChatGPT generates the code, it is your responsibility to fully understand it. You must supply comments demonstrating your understanding of the code. Marks are awarded not for the code but for the quality of the comments.
- You must comment everywhere in your program where you made use of ChatGPT
- In the comment, you must include the prompt (instruction) you gave to ChatGPT for it to produce that piece of code
- For example, for a prompt that reads “*Provide C++ code for a function that outputs a Fibonacci sequence of n terms, where n is provided as a parameter to the function*”, the following code is produced by ChatGPT:

```
#include <iostream>

using namespace std;

void fibonacci(int n) {
    int a = 0, b = 1, c, i;
    if (n == 0) return;
    cout << a << " ";
    if (n == 1) return;
    cout << b << " ";
    for (i = 2; i < n; i++) {
        c = a + b;
        cout << c << " ";
        a = b;
        b = c;
    }
}

int main() {
    int n;
    cout << "Enter the number of terms: ";
    cin >> n;
    cout << "Fibonacci sequence: ";
    fibonacci(n);
    return 0;
}
```

- In your program, you would then have the following comment above the code segment you obtained from ChatGPT: // The following logic was generated using ChatGPT via the prompt: “Provide C++ code for a function that outputs a Fibonacci sequence of n terms, where n is provided as a parameter to the function”



Problem description

Create a menu-driven program which makes use of the following types of loops as appropriate: while, do-while, for, for-each. You need to use each specific loop type at least once in the assignment.

Your program should present the user with the following options

- **Option A:** Your program must output the following sequence (the number of terms in the sequence is given by the user): 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144 (Fibonacci number¹)
- **Option B:** Your program must calculate the sum of n Fibonacci numbers (n is given by the user)
- **Option C:** Your program must accept a string from the user and use it to create and output a palindrome². For example:
 - if the user enters the string "race", your program must output "racecar"
 - If the user enters the string "ten", your program must output "tenet"
 - ...and so forth.
- **Option X:** The program must exit

The design should be based on Option B.

Important: You must use **ChatGPT** to complete this practical.

Programs that do not compile successfully will be capped at 40%.

For only this practical assignment, if you do not use ChatGPT, you will be capped at 40%.

Mark sheet		
	Coding style (comments, indentation, naming)	10
	Comments for validating user inputs	10
	Comments for Option A logic	10
	Comments for Option B logic	10
	Comments for Option C logic	10
	Comments for the do-while loop	10
	Comments for the while loop	10
	Comments for the for loop	10
	Comments for the for-each loop	10
	Design	10
	Total	/100

¹ https://en.wikipedia.org/wiki/Fibonacci_number

² <https://en.wikipedia.org/wiki/Palindrome>