Lab Assignment

Computer Systems and Programming

Lab Manual 2 Home Task

Prepared by: M. Sannan Nawaz (477200)

Class: ME-15 C

1. Create a program that takes a student's score as input and assigns a grade based on predefined criteria using logical operators (e.g., A, B, C, D, F).

   A-Grade: 90-100 Marks

   B-Grade: 75-90 Marks

   C-Grade: 60-75 Marks

   D-Grade: 45-60 Marks

   F-Grade: 0-45 Marks

```cpp
#include <iostream>

using namespace std;

int main() {
    float a;
    cout << "Enter your score" << endl;
    cin >> a;
    if (a>100 && a<0) cout << "Your score is invalid" << endl;
    if (a>=90 && a<=100) cout << "Your grade is A" << endl;
    if (a>=75 && a<90) cout << "Your grade is B" << endl;
    if (a>=60 && a<75) cout << "Your grade is C" << endl;
    if (a>=45 && a<60) cout << "Your grade is D" << endl;
    if (a>=0 && a<45) cout << "Your grade is F" << endl;
    return 0;
}
```

```
Enter your score
98
Your grade is A

Process returned 0 (0x0)   execution time : 2.695 s
Press any key to continue.
```

```
Enter your score
81
Your grade is B

Process returned 0 (0x0)   execution time : 1.747 s
Press any key to continue.
```

```
Enter your score
64
Your grade is C

Process returned 0 (0x0)   execution time : 5.423 s
Press any key to continue.
```

```
Enter your score
48
Your grade is D

Process returned 0 (0x0)   execution time : 10.644 s
Press any key to continue.
```

```
Enter your score
22
Your grade is F

Process returned 0 (0x0)   execution time : 1.772 s
Press any key to continue.
```

```
Enter your score
120
Your score is invalid

Process returned 0 (0x0)   execution time : 1.413 s
Press any key to continue.
```

Question 2

2. Write a program that takes an integer as input and determines if it is both even and divisible by 5.

```cpp
#include <iostream>

using namespace std;

int main() {
    int a;
    cout << "Enter your integer" << endl;
    cin >> a;
    if (a%2==0 && a/5) cout << "Your integer is even and divisible by 5" << endl;
    else cout << "Your integer is odd and not divisible by 5" << endl;
    return 0;
}
```

```
Enter your integer
10
Your integer is even and divisible by 5

Process returned 0 (0x0)   execution time : 0.867 s
Press any key to continue.
```

```
Enter your integer
13
Your integer is odd and not divisible by 5

Process returned 0 (0x0)   execution time : 1.276 s
Press any key to continue.
```

Question 3

3. Create a C++ program that checks if a user-provided year is a leap year.

```cpp
#include <iostream>

using namespace std;

int main() {
    int y;
    cout << "Enter your year" << endl;
    cin >> y;
    if ((y%4==0 && y%100!=0) || (y%400==0))
    cout << "The year you entered is a leap year" << endl;
    else cout << "The year you entered is not a leap year" << endl;
    return 0;
}
```

```
Enter your year
2024
The year you entered is a leap year

Process returned 0 (0x0)   execution time : 1.625 s
Press any key to continue.
```

```
Enter your year
2026
The year you entered is not a leap year

Process returned 0 (0x0)   execution time : 4.039 s
Press any key to continue.
```

Question 4

4. Create a C++ program that determines if a student is eligible for a scholarship based on their GPA (must have GPA >= 3.5) and attendance (must have attended at least 80% of classes).

```cpp
#include <iostream>

using namespace std;

int main() {
    float a,b;
    cout << "Enter your GPA" << endl;
    cin >> a;
    cout << "Enter your attendance" << endl;
    cin >> b;
    if (a>=3.5 && b>=80) cout << "You are eligible for the scholarship" << endl;
    else cout << "You are not eligible for the scholarship" << endl;
    return 0;
}
```

```
Enter your GPA
3.7
Enter your attendance
95
You are eligible for the scholarship

Process returned 0 (0x0)   execution time : 6.951 s
Press any key to continue.
```

```
Enter your GPA
3.1
Enter your attendance
73
You are not eligible for the scholarship

Process returned 0 (0x0)   execution time : 9.981 s
Press any key to continue.
```

Question 5

5. Write a program that checks if a given character is a vowel (a, e, i, o, u) or a consonant using logical operators.

```
#include <iostream>

using namespace std;

int main() {
    string a;
    cout << "Enter your alphabet" << endl;
    cin >> a;
    if (a=="a"||a=="e"||a=="i"||a=="o"||a=="u")
    cout << "Your alphabet is a vowel" << endl;
    else cout << "Your alphabet is a consonant" << endl;
    return 0;
}
```

```
Enter your alphabet
a
Your alphabet is a vowel

Process returned 0 (0x0)   execution time : 1.754 s
Press any key to continue.
```

```
Enter your alphabet
d
Your alphabet is a consonant

Process returned 0 (0x0)   execution time : 1.129 s
Press any key to continue.
```