CENG241 Labwork 3

1. Write a C++ program in which you first define a COURSE struct with two variables: code and grade. Then let the user (a student) to fill a COURSE vector with as many courses as they want, and when done, display cumulative grade of the student. Use C++ vectors and the functions provided by them.

```
Sample Run #1:
Enter course code and grade: CENG105 3.0
Add new course? y
Enter course code and grade: CENG111 3.0
Add new course? y
Enter course code and grade: CENG114 2.5
Add new course? n

List of entered 3 courses:
- CENG105, Grade: 3
- CENG111, Grade: 3
- CENG114, Grade: 2.5
CGPA: 2.83333

Sample Run #2:
Enter course code and grade: BIO101 2.0
Add new course? y
Enter course code and grade: CENG105 3.0
Add new course? y
Enter course code and grade: CENG111 2.5
Add new course? y
Enter course code and grade: ENG121 3.5
Add new course? y
Enter course code and grade: ESR101 3.5
Add new course? y
Enter course code and grade: MATH155 0
Add new course? y
Enter course code and grade: PHYS131 0.5
Add new course? y
Enter course code and grade: TURK101 3.0
Add new course? n

List of entered 8 courses:
- BIO101, Grade: 2
- CENG105, Grade: 3
- CENG111, Grade: 2.5
- ENG121, Grade: 3.5
- ESR101, Grade: 3.5
- MATH155, Grade: 0
- PHYS131, Grade: 0.5
- TURK101, Grade: 3
CGPA: 2.25
```

2. Write a C++ program which prints a repeated sequence of letters on screen; where the number of letters N (e.g. 4), the letters themselves (e.g. c, e, n, g) and their amounts (e.g. 1, 2, 3, 4) are specified by the user. Letters and their amounts must be stored in dynamic arrays (of integer and character types respectively) that are N-elements long. You must use `new` and `delete[]` operators for dynamic memory allocation.

```
Sample Run #1:
How many numbers letters are you going to enter? 4
Enter letter and how many times it will be repeated: c 1
Enter letter and how many times it will be repeated: e 2
Enter letter and how many times it will be repeated: n 3
Enter letter and how many times it will be repeated: g 4
ceennngggg

Sample Run #2:
How many numbers letters are you going to enter? 9
Enter letter and how many times it will be repeated: h 3
Enter letter and how many times it will be repeated: e 5
Enter letter and how many times it will be repeated: l 4
Enter letter and how many times it will be repeated: o 2
Enter letter and how many times it will be repeated: w 4
Enter letter and how many times it will be repeated: o 3
Enter letter and how many times it will be repeated: r 5
Enter letter and how many times it will be repeated: l 2
Enter letter and how many times it will be repeated: d 5
hhheeeeellllooowwwwooorrrrrlldddddd
```

3. Write a C++ program which adds up numbers of an array from left to right or vice versa. For this purpose;

   - Implement a NUMBERLIST struct that contains an integer array of size 10 and a string. This string will be used to define in which direction the array will be traversed ("left-to-right" or "right-to-left").
   - Define a function which accepts a pointer type variable of this structure. This function will add up the numbers and overwrite them depending on the direction.
   - Define an another function which is almost the same with the first function, but it should accept a reference type variable (instead of a pointer).

   Create two variables of the structure, fill them, use one of them in pointer-type function and the other in reference-type function, and display results within main function on screen.

```
Sample Run:
Enter 10 integers and order of summation: 13 2 17 46 51 24 78 9 11 82 left-to-right
Result: 13 15 32 78 129 153 231 240 251 333

Enter 10 integers and order of summation: 22 15 62 98 40 5 76 92 12 3 right-to-left
Result: 425 403 388 326 228 188 183 107 15 3
```