CS19001: Programming and Data Structures Laboratory
Assignment No. 2 (Conditional Statements and Branching)
Date: 16-August-2019

Problem Statement:

The ERP Section of *Wonderland University* has decided to build a program for helping their Professors to check for grades of students with respect to flexible cutoff schemes in different subjects. To do so, the university administration want to hire you to write the C-program to perform the following details.

- The program asks from the user the student roll number (as an integer) and their attendance (percentage) in the subject. You need to also check for invalid attendance entered and report the invalidity (if any).

- In case of above entries are valid, the program then asks from the user to enter the marks (within range $[0, 100]$) for the subject along with specifying whether it is normal examination or supplementary/backlog examination. You need to also check for invalid marks entered and report the invalidity (if any).

- In case of above entries are valid, the program then asks from the user to choose whether the grading scheme is *Absolute* (with $EX >= 90$, $A >= 80$, $B >= 70$, $C >= 60$, $D >= 50$, $P >= 40$ *or* $F < 40$) or *Relative*. In case of *Relative* grading scheme, the user then has to provide the details of these 6 cutoffs (integer quantity). You need to check the validity of these set cutoffs (for example, things like the cutoff for 'A' grade should not be less than the cutoff for 'B' grade) and report the invalidity (if any).

- The grading scheme is as follows:

  - If the attendance percentage falls below 80%, the grade is automatically 'F' (failure).
  - If attendance is proper, then the grade is calculated based on absolute or relative thresholds provided (as per the cutoffs indicated by user).
  - In case of supplementary/backlog examination, the grade will be one lower than the actual grade obtained. *Interestingly in this category, a student can never achieve 'EX' grade (why?).*

- Finally, the output will be – (i) the subject marks written in English words, and (ii) the grades obtained by a student (both).

Example Inputs/Outputs:

Sample-1:

```
++ Enter Student Roll Number: 10000
++ Enter the Attendance Percentage: 70

-- The Grade of 10000 is: F (Shortage in Attendance!)
```

Sample-2:

```
++ Enter Student Roll Number: 10000
++ Enter the Attendance Percentage: 87
++ Enter Subject Marks (out of 100): 103

-- Error: Mistake in Marks Record!
```

Sample-3:

```
++ Enter Student Roll Number: 10000
++ Enter the Attendance Percentage: 91
++ Enter Subject Marks (out of 100): 83
++ Is this marks for Supplementary / Backlog Examination? (Type '0' if NOT): 0
++ Do you want Relative Grading? (Type '0' if NOT): 0

-- The Subject Marks of 10000 is: Eighty Three
-- The Absolute Grade of 10000 is: A
```

Sample-4:

```
++ Enter Student Roll Number: 10000
++ Enter the Attendance Percentage: 91
++ Enter Subject Marks (out of 100): 87
++ Is this marks for Supplementary / Backlog Examination? (Type '0' if NOT): 1
++ Do you want Relative Grading? (Type '0' if NOT): 0

-- The Subject Marks of 10000 is: Eighty Seven
-- The Absolute Grade of 10000 is: B
```

Sample-5:

```
++ Enter Student Roll Number: 10000
++ Enter the Attendance Percentage: 89
++ Enter Subject Marks (out of 100): 80
++ Is this marks for Supplementary / Backlog Examination? (Type '0' if NOT): 0
++ Do you want Relative Grading? (Type '0' if NOT): 1
++ Set Cut-off Parameters:
        ++ Cut-off for EX = 88
        ++ Cut-off for  A = 76
        ++ Cut-off for  B = 65
        ++ Cut-off for  C = 55
        ++ Cut-off for  D = 41
        ++ Cut-off for  P = 30

-- The Subject Marks of 10000 is: Eighty
-- The Relative Grade of 10000 is: A
```

Sample-6:

```
++ Enter Student Roll Number: 10000
++ Enter the Attendance Percentage: 93
++ Enter Subject Marks (out of 100): 75
++ Is this marks for Supplementary / Backlog Examination? (Type '0' if NOT): 0
++ Do you want Relative Grading? (Type '0' if NOT): 1
++ Set Cut-off Parameters:
        ++ Cut-off for EX = 88
        ++ Cut-off for  A = 77
        ++ Cut-off for  B = 77
        ++ Cut-off for  C = 54
        ++ Cut-off for  D = 40
        ++ Cut-off for  P = 28

-- Error: Cut-off for 'B' is not less than Cut-off for 'A'!
```

Sample-7:

```
++ Enter Student Roll Number: 10000
++ Enter the Attendance Percentage: 91
++ Enter Subject Marks (out of 100): 63
++ Is this marks for Supplementary / Backlog Examination? (Type '0' if NOT): 1
++ Do you want Relative Grading? (Type '0' if NOT): 1
++ Set Cut-off Parameters:
        ++ Cut-off for EX = 101
        ++ Cut-off for  A = 82
        ++ Cut-off for  B = 70
        ++ Cut-off for  C = 57
        ++ Cut-off for  D = 43
        ++ Cut-off for  P = 32

-- Error: Cut-off for 'EX' is beyond Maximum Marks Limit!
```

Submit a single C source file. Do not use global/static variables.