

15CSE180 Computer Programming Lab
Periodical Lab - 1
(50 Marks)
Set – 1

1. A certain grade of steel is graded according to the following conditions:
 - i. Hardness must be greater than 50
 - ii. Carbon content must be less than 0.7
 - iii. Tensile strength must be greater than 5600

The grades of steel are as follows.

- a) Grade is 10 if all three conditions are met.
- b) Grade is 9 if conditions i and ii are met.
- c) Grade is 8 if conditions ii and iii are met.
- d) Grade is 7 if conditions i and iii are met.
- e) Grade is 6 if only one condition is met.
- f) Grade is 5 if none of the conditions are met.

Write a program to find the grade of a given a steel. Use a function `gradeSteel()` to find the grade.

Sample Session follows.

```
How many steels you want to grade: 2
Enter data: 35 0.8 5700 60 0.5 6000
Grades: 8 7
```

```
Do you want to continue (y/n): y
```

```
How many steels you want to grade: 2
Enter data: 52 0.8 5700 65 0.93
Error! Insufficient data!!
```

```
Do you want to continue (y/n): n
```

2. Given an array of n elements, write a program to find the number of *local extrema* in the array. A *local extrema* is an element which is either greater than its both neighbors or less than its both neighbors.

Given $\{1, 5, 2, 5\}$ the number of local extrema is 2 (5 is between 1 and 2. 2 is between 5 and 5).

Given $\{1, 2, 3\}$ the output should be 0 since there are no local extrema in this case.

15CSE180 Computer Programming Laboratory
Periodical Lab – 1
(50 Marks)
Set – 2

1. Patel's discount bolt charges the following prices: Rs. 5 per bolt, Rs. 3 per nut and Rs. 1 per washer. Write a program that asks the user for the number of bolts, nuts, and washers in their purchase and then calculates and prints out the total. As an added feature, the program checks the order. A correct order must have at least as many nuts as bolts and at least twice as many washers as bolts; otherwise the order has an error. If the order is ok, then the cost of the order is printed out. Use function to realize the above requirement.

A sample session follows:

```
Enter order (bolts, nuts, washers): 10 10 20
Total price: Rs. 100
```

```
Do you want to continue (y/n): y
Enter order (bolts, nuts, washers): 10 20 20
Error! Too many nuts!!
```

```
Do you want to continue (y/n): y
Enter order (bolts, nuts, washers): 10 20 10
Error! Too many nuts!!
Error! Too few washers!!
```

```
Do you want to continue (y/n): n
```

2. Given two unsorted arrays of distinct elements, write a program to find all the pairs from both arrays (each element of pair should be from each array) whose sum is equal to X.

Given $\{-1, -2, 4, -6, 5, 7\}$, $\{6, 3, 4, 0\}$ and $X = 8$ the output should be $[(5, 3), (4, 4)]$.

Given $\{1, 2, 4, 5, 7\}$, $\{5, 6, 3, 4, 8\}$ and $X = 9$ the output should be $[(1, 8), (4, 5), (5, 4)]$.