

PPS11

Q1

Aim:

An automobile company has serial number for engine parts starting from AA0 to FF9. The other characteristics of parts to be specified in a structure are: Year of manufacture, material and quantity manufactured.

- a) Specify a structure to store information corresponding to a part.
- b) Write a program to retrieve information on parts with serial numbers between BB1 and CC6.

Procedure:

Input:

Number of details to be checked, 'n'
Serial Number of engine, 'srno'

Output:

If input serial number is within the range:
Serial Number of Engine
Year of Manufacture
Material Used
Quantity Manufactured

Algorithm:

Step 1: Create a structure 'engine' with datatypes Serial number (char[]), Year (int), Material (char[]) and Quantity (int)
Step 2: Create an array of structure 'arr' with details of engines from serial number 'BB1' to 'BB6'

Main Function

Step 1: Read integer variable 'n'
Step 2: Repeat steps 3 to 6 n times
Step 3: Read char array 'srno'
Step 4: Store length of 'srno' in integer variable 'l'
Step 5: If 'l' is not equal to 3 then i = -1
 Else If srno[0] is equal to 'B' then i = srno[2] - 1 - 48
 Else If srno[0] is equal to 'C' then i = srno[2] - 1 - 48
 Else i = -1
Step 6: If i is greater than 15 or i is equal to -1 then print "Does not exist in database."
 Else print the details of the engine
Step 7: Return 0

Code:

Output:

```
PPS11 - Visual Studio Code
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
powershell + - [ ] [X] < X
PS C:\Users\Vidhi Shah\Desktop\VITC Sem 2\C++ Lab\PPS11> gcc -o struct struct.c
PS C:\Users\Vidhi Shah\Desktop\VITC Sem 2\C++ Lab\PPS11> ./struct

Enter number of details to be checked: 5

Enter Serial Number: BB7
Serial Number: BB7
Year of Manufacture: 2005
Material Used: Steel
Quantity Manufactured: 23

Enter Serial Number: AA6
Does not exist in database.

Enter Serial Number: BB23
Does not exist in database.

Enter Serial Number: CC5
Serial Number: CC5
Year of Manufacture: 2020
Material Used: Stainless Steel
Quantity Manufactured: 23

Enter Serial Number: FF
Does not exist in database.

PS C:\Users\Vidhi Shah\Desktop\VITC Sem 2\C++ Lab\PPS11> |
```

Code:

```
#include <stdio.h>
#include <string.h>

struct engine {
    char sno[4];
    int year;
    char mat[30];
    int quant;
};

struct engine arr []= {"BB1", 1990, "Stainless Steel", 23},
{"BB2", 1992, "Stainless Steel", 23},
{"BB3", 1995, "Steel", 23},
{"BB4", 1999, "Iron", 23},
{"BB5", 2000, "Stainless Steel", 23},
{"BB6", 2003, "Aluminium", 23},
{"BB7", 2005, "Steel", 23},
{"BB8", 2006, "Steel", 23},
{"BB9", 2009, "Stainless Steel", 23},
{"CC0", 2010, "Iron", 23},
{"CC1", 2012, "Iron", 23},
{"CC2", 2015, "Steel", 23},
{"CC3", 2017, "Aluminium", 23},
{"CC4", 2019, "Aluminium", 23},
{"CC5", 2020, "Stainless Steel", 23},
{"CC6", 2021, "Steel", 23};
```

```

int main() {
    char srno[4];
    int n, i, j, l;

    printf("\nEnter number of details to be checked: ");
    scanf("%d", &n);

    for (j = 0; j < n; j++) {

        printf("\nEnter Serial Number: ");
        scanf("%s", &srno);
        l = strlen(srno);

        if (l != 3)
            i = -1;
        else if (srno[0] == 'B')
            i = srno[2] - 1 - 48;
        else if (srno[0] == 'C')
            i = srno[2] + 9 - 48;
        else {
            i = -1;
        }

        if (i > 15 || i == -1) {
            printf("Does not exist in database.\n");
        }

        else {
            printf("Serial Number: %s", arr[i].sno);
            printf("\nYear of Manufacture: %d", arr[i].year);
            printf("\nMaterial Used: %s", arr[i].mat);
            printf("\nQuantity Manufactured: %d\n", arr[i].quant);
        }
    }

    printf("\n");
    return 0;
}

```

```
File Edit Selection View Go Run Terminal Help structc - PPS11 - Visual Studio Code
C structc X
1 #include <stdio.h>
2 #include <string.h>
3
4 struct engine {
5     char sno[4];
6     int year;
7     char mat[30];
8     int quant;
9 };
10
11 struct engine arr []= {{"BB1", 1990, "Stainless Steel", 23},
12 {"BB2", 1992, "Stainless Steel", 23},
13 {"BB3", 1995, "Steel", 23},
14 {"BB4", 1999, "Iron", 23},
15 {"BB5", 2000, "Stainless Steel", 23},
16 {"BB6", 2003, "Aluminium", 23},
17 {"BB7", 2005, "Steel", 23},
18 {"BB8", 2006, "Steel", 23},
19 {"BB9", 2009, "Stainless Steel", 23},
20 {"CC0", 2010, "Iron", 23},
21 {"CC1", 2012, "Iron", 23},
22 {"CC2", 2015, "Steel", 23},
23 {"CC3", 2017, "Aluminium", 23},
24 {"CC4", 2019, "Aluminium", 23},
25 {"CC5", 2020, "Stainless Steel", 23},
26 {"CC6", 2021, "Steel", 23}};
27
28 int main() {
29     char srno[4];
30     int n, i, j, l;
31
32     printf("\nEnter number of details to be checked: ");
33     scanf("%d", &n);
34
35     for (j = 0; j < n; j++) {
36
37         printf("\nEnter Serial Number: ");
38         scanf("%s", &srno);
39         l = strlen(srno);
40
41         if (l != 3)
42             i = -1;
43         else if (srno[0] == 'B')
44             i = srno[2] - 1 - 48;
45         else if (srno[0] == 'C')
46             i = srno[2] - 9 - 48;
47     }
48
49     if (i > 15 || i == -1) {
50         printf("Does not exist in database.\n");
51     }
52     else {
53         printf("Serial Number: %s", arr[i].sno);
54         printf("\nYear of Manufacture: %d", arr[i].year);
55         printf("\nMaterial Used: %s", arr[i].mat);
56         printf("\nQuantity Manufactured: %d\n", arr[i].quant);
57     }
58
59     printf("\n");
60     return 0;
61 }
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

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PS C:\Users\Vidhi Shah\Desktop\VIITC Sem 2\C++ Lab\PPS11> ./struct

Enter number of details to be checked: 5

Enter Serial Number: BB7
Serial Number: BB7
Year of Manufacture: 2005
Material Used: Steel
Quantity Manufactured: 23

Enter Serial Number: AA6
Does not exist in database.

Enter Serial Number: BB23
Does not exist in database.

Enter Serial Number: CCS
Serial Number: CCS
Year of Manufacture: 2020
Material Used: Stainless Steel
Quantity Manufactured: 23

Enter Serial Number: FF
Does not exist in database.

PS C:\Users\Vidhi Shah\Desktop\VIITC Sem 2\C++ Lab\PPS11>

```
File Edit Selection View Go Run Terminal Help structc - PPS11 - Visual Studio Code
C structc X
26 {"CC6", 2021, "Steel", 23}};
27
28 int main() {
29     char srno[4];
30     int n, i, j, l;
31
32     printf("\nEnter number of details to be checked: ");
33     scanf("%d", &n);
34
35     for (j = 0; j < n; j++) {
36
37         printf("\nEnter Serial Number: ");
38         scanf("%s", &srno);
39         l = strlen(srno);
40
41         if (l != 3)
42             i = -1;
43         else if (srno[0] == 'B')
44             i = srno[2] - 1 - 48;
45         else if (srno[0] == 'C')
46             i = srno[2] + 9 - 48;
47         else {
48             i = -1;
49         }
50
51         if (i > 15 || i == -1) {
52             printf("Does not exist in database.\n");
53         }
54         else {
55             printf("Serial Number: %s", arr[i].sno);
56             printf("\nYear of Manufacture: %d", arr[i].year);
57             printf("\nMaterial Used: %s", arr[i].mat);
58             printf("\nQuantity Manufactured: %d\n", arr[i].quant);
59         }
60     }
61
62     printf("\n");
63     return 0;
64 }
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

PS C:\Users\Vidhi Shah\Desktop\VIITC Sem 2\C++ Lab\PPS11> gcc -o struct struct.c

PS C:\Users\Vidhi Shah\Desktop\VIITC Sem 2\C++ Lab\PPS11> ./struct

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Enter Serial Number: BB7
Serial Number: BB7
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Material Used: Steel
Quantity Manufactured: 23

Enter Serial Number: AA6
Does not exist in database.

Enter Serial Number: BB23
Does not exist in database.

Enter Serial Number: CCS
Serial Number: CCS
Year of Manufacture: 2020
Material Used: Stainless Steel
Quantity Manufactured: 23

Enter Serial Number: FF
Does not exist in database.

PS C:\Users\Vidhi Shah\Desktop\VIITC Sem 2\C++ Lab\PPS11>