SVKM's NMIMS

Mukesh Patel School of Technology Management and Engineering, Mumbai

Programming for Problem Solving (Exp 9 - 1)

Roll No: J001	**Name: Adith Ramakrishna**
Program: B. Tech Data Science (1st)	**Batch: J1**
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Task 1:

Output:
AbdulKalam 1931

Task 2:

Code:

```
#include <iostream>

using namespace std;

struct student {
   int code = 0;
   char name[30] = "";
   float marks = 0;
   int dept_number = 0;
}
students;

int main() {
   cout << "Enter details for new student\n\nCode: ";
   cin >> students.code;
   cout << "Name: ";
   cin >> students.name;
   cout << "Marks: ";
   cin >> students.marks;
   cout << "Department No: ";
   cin >> students.dept_number;
   cout << endl;

   cout << "\n\nStudent Details:\n\nName: " << students.name <<
"\nCode: " << students.code << "\nMarks: " << students.marks;
```

```
   if (students.dept_number == 1) {
      cout << "\nDepartment: IT";
   } else if (students.dept_number == 2) {
      cout << "\nDepartment: COMP";
   } else if (students.dept_number == 3) {
      cout << "\nDepartment: EXTC";
   } else if (students.dept_number == 4) {
      cout << "\nDepartment: Data Science";
   }
}
```

Task 3:

```
#include <iostream>
#include <cstring>

using namespace std;

struct employee {
   char name[30] = "";
   int id = 0;
   int experience = 0;
   long long salary = 0;

}
emp[100];

int main() {
   strcpy(emp[0].name, "Adith");
   emp[0].id = 1;
   emp[0].experience = 5;
   emp[0].salary = 10000;
   for (int i = 0; i < 100; i++) {
```

```
      if (emp[i].salary < 100000 && emp[i].experience >= 5) {
         cout << "\n\nEmployee Details:\n\nName: " << emp[i].name <<
"\nID: " << emp[i].id << "\nExperience: " << emp[i].experience <<
"\nSalary: " << emp[i].salary;
      }
   }
}
```

Task 4:

Output:

The size of staff structure variable 48

Task 5:

Code:

```
#include <iostream>
#include <algorithm>
using namespace std;

struct student {
   char name[30] = "";
   int roll_no = 0;
   float marks_1 = 0;
   float marks_2 = 0;
   float marks_3 = 0;
   float grand_total = 0;
};

bool compareMarks(student g1, student g2) {
   if (g1.grand_total < g2.grand_total) {
```

```
        return true;
    }
    return false;
}

int main() {
    int n;
    cout << "Enter number of students: ";
    cin >> n;
    cout << "\n\n";
    student students[n];
    for (int i = 0; i < n; i++) {
        cout << "Enter details for student " << i + 1 << "\nName: ";
        cin >> students[i].name;
        cout << "Roll No: ";
        cin >> students[i].roll_no;
        cout << "Marks 1: ";
        cin >> students[i].marks_1;
        cout << "Marks 2: ";
        cin >> students[i].marks_2;
        cout << "Marks 3: ";
        cin >> students[i].marks_3;
        students[i].grand_total = students[i].marks_1 + students[i].marks_2
+ students[i].marks_3;
        cout << endl;
    }
    sort(students, students + n, compareMarks);
}<< endl;
    }
}
```

Homework Questions:

1:

Code:

```
#include <iostream>
using namespace std;

struct computer {
   char cpu_type[30] = "";
   long long hard_disk_size = 0;
   char keyboard_type[30] = "";
   char mouse_type[30] = "";
   char monitor_type[30] = "";
}
office_comp[50];

int main() {
   for (int i = 0; i < 50; i++) {
      cout << "Enter details for Computer " << i + 1 << "\nCPU Type: ";
      cin >> office_comp[i].cpu_type;
      cout << "Hard Disk Size (GB): ";
      cin >> office_comp[i].hard_disk_size;
      cout << "Keyboard Type: ";
      cin >> office_comp[i].keyboard_type;
      cout << "Mouse Type: ";
      cin >> office_comp[i].mouse_type;
      cout << "Monitor Type: ";
      cin >> office_comp[i].monitor_type;
      cout << "\n\n";
   }
   for (int i = 0; i < 50; i++) {
      if (office_comp[i].hard_disk_size > 8) {
```

```
        cout << "\n\nComputer Details:\n\nCPU Type: " <<
office_comp[i].cpu_type << "\nHard Disk Size (GB): " <<
office_comp[i].hard_disk_size << "\nKeyboard Type: " <<
office_comp[i].keyboard_type << "\nMouse Type: " <<
office_comp[i].mouse_type << "\nMonitor Type: " <<
office_comp[i].monitor_type;

      }
   }
}
```

2:

Structures are a way to group several related variables of any data type combinations into one place. Each variable in the structure is known as a member of the structure.

3:

A structure inside another structure is called nested structure

4:

Code:

```
#include <iostream>

using namespace std;

struct student {
   int code = 0;
   char name[30] = "";
   float marks = 0;
   int dept_number = 0;
```

```
};

int main() {
   int n;
   cout << "Enter number of students: ";
   cin >> n;
   cout << "\n\n";
   student students[n];
   for (int i = 0; i < n; i++) {
      cout << "Enter details for student " << i + 1 << "\n\nCode:
";
      cin >> students[i].code;
      cout << "Name: ";
      cin >> students[i].name;
      cout << "Marks: ";
      cin >> students[i].marks;
      cout << "Department No: ";
      cin >> students[i].dept_number;
      cout << "\n\n";
   }
   char input, repeat = 'y';
   int i, max = 0, min = 0, dept_num = 0;
   do {
      cout << "\n\nStudent Management System:\n\na. Display
Highest and Lowest Marks\nb. Display Department Wise
Student Info\n\n";
      cin >> input;

      switch (input) {
      case 'a':
         max = students[0].marks;
```

```
        min = students[0].marks;
        for (i = 1; i < n; i++) {
          if (students[i].marks > max) {
            max = i;
          }
          if (students[i].marks < min) {
            min = i;
          }
        }
        cout << "\nHighest Marks:\nName: " <<
students[max].name << "\nMarks: " << students[max].marks <<
endl;
        cout << "\nLowest Marks:\nName: " <<
students[min].name << "\nMarks: " << students[min].marks <<
endl;
        break;
      case 'b':
        cout << "Enter Department Number: ";
        cin >> dept_num;
        cout << "\n\n";
        for (i = 0; i < n; i++) {
          if (students[i].dept_number == dept_num) {
            cout << "\n\nStudent Details:\n\nName: " <<
students[i].name << "\nCode: " << students[i].code <<
"\nMarks: " << students[i].marks;
            if (students[i].dept_number == 1) {
              cout << "\nDepartment: IT";
            } else if (students[i].dept_number == 2) {
              cout << "\nDepartment: COMP";
            } else if (students[i].dept_number == 3) {
              cout << "\nDepartment: EXTC";
```

```
            } else if (students[i].dept_number == 4) {
                cout << "\nDepartment: Data Science";
            }

          }
        }
        break;
      default:
        cout << "Invalid Option!";
        break;
      }

      cout << "\n\n\nWould you like to continue? (Y/n)\n";
      cin >> repeat;
    } while (repeat != 'n' && repeat != 'N');
}
```