**SD1 Programming**

**Exercise Sheet 3**

1. Write a program that will accept as input the marks obtained by each of the students in a class of 10 students. The program should count and then display the percentage of students that obtained a first class honours mark. To achieve first class honours a mark of 70 or greater is required.

**int \_tmain(int argc, \_TCHAR\* argv[])**

**{**

**int mark, numFirstClass=0;**

**const int gradeMark = 70;**

**double percentFirstClass;**

**for ( int i = 0; i < 10; i++ )**

**{**

**cout << "Enter a mark : ";**

**cin >> mark;**

**if ( mark >= 70 )**

**numFirstClass++;**

**}**

**percentFirstClass = (double) numFirstClass / 10 \* 100;**

**cout << percentFirstClass << "% gained first class marks\n" ;**

**return 0;**

**}**

1. Adapt your answer for question 1 so that the program may be used with a class of any size. The program should accept as input the class size followed by the set of marks for the class.

**int \_tmain(int argc, \_TCHAR\* argv[])**

**{**

**int mark, numStudents, numFirstClass=0;**

**const int gradeMark = 70;**

**double percentFirstClass;**

**cout << "Enter number of students :";**

**cin >> numStudents;**

**for ( int i = 0; i < numStudents; i++ )**

**{**

**cout << "Enter a mark : ";**

**cin >> mark;**

**if ( mark >= 70 )**

**numFirstClass++;**

**}**

**percentFirstClass = (double) numFirstClass / numStudents \* 100;**

**cout << percentFirstClass << "% gained first class marks\n" ;**

**return 0;**

**}**

1. Adapt your answer for question 1 so that the class size is not entered but a final mark of -1 is entered to terminate the list of marks.

**int \_tmain(int argc, \_TCHAR\* argv[])**

**{**

**int mark, numStudents = 0, numFirstClass=0;**

**const int gradeMark = 70;**

**double percentFirstClass;**

**do**

**{**

**cout << "Enter a mark : ";**

**cin >> mark;**

**if ( mark != -1 )**

**{**

**numStudents++;**

**if ( mark >= 70 )**

**numFirstClass++;**

**}**

**} while ( mark != -1);**

**percentFirstClass = (double) numFirstClass / numStudents \* 100;**

**cout << percentFirstClass << "% gained first class marks\n" ;**

**return 0;**

**}**

1. Adapt your answer to question 4 to allow for the fact that no students may have sat the exam.

**int \_tmain(int argc, \_TCHAR\* argv[])**

**{**

**int mark, numStudents = 0, numFirstClass=0;**

**const int gradeMark = 70;**

**double percentFirstClass;**

**cout << "Enter a mark : ";**

**cin >> mark;**

**while ( mark != -1)**

**{**

**if ( mark != -1 )**

**{**

**numStudents++;**

**if ( mark >= 70 )**

**numFirstClass++;**

**}**

**cout << "Enter a mark : ";**

**cin >> mark;**

**}**

**if ( numStudents != 0 )**

**{**

**percentFirstClass = (double) numFirstClass / numStudents \* 100;**

**cout << percentFirstClass << "% gained first class marks\n" ;**

**}**

**return 0;**

**}**

1. Write a program that will display all the numbers in the range 1 to 100 that are evenly divisible by 3 and by 8.

**int \_tmain(int argc, \_TCHAR\* argv[])**

**{**

**for ( int i = 0; i < 100; i++ )**

**{**

**if ( i % 3 == 0 && i % 8 == 0 )**

**cout << i << endl;**

**}**

**return 0;**

**}**

1. Write a program to display all the hour and minute values in a 24-hour clock from 00:00 to 23:59

**int \_tmain(int argc, \_TCHAR\* argv[])**

**{**

**for ( int hour = 0; hour < 24; hour++ )**

**{**

**for ( int minute = 0; minute < 60; minute++ )**

**{**

**cout << setw(2) << setfill('0') <<hour**

**<< ':'**

**<<setw(2) << setfill('0') << minute << endl;**

**//cin.get();**

**}**

**//cin.get();**

**}**

**return 0;**

**}**

1. Write a program to display the following pattern

x x x x x

x x x x x

x x x x x

x x x x x x x x x x x x x x x

x x x x x x x x x x x x x x x

x x x x x x x x x x x x x x x

x x x x x

x x x x x

x x x x x

**int \_tmain(int argc, \_TCHAR\* argv[])**

**{**

**cout << "\n\n\n";**

**for ( int row = 0; row < 9; row++ )**

**{**

**cout << '\t';**

**for ( int col = 0; col < 15; col++ )**

**{**

**if ( row < 3 || row > 5 )**

**{**

**if ( col < 5 || col > 9 )**

**cout << ' ';**

**else**

**cout << '\*';**

**}**

**else**

**cout << '\*';**

**}**

**cout << endl;**

**}**

**cout << "\n\n\n";**

**return 0;**

**}**