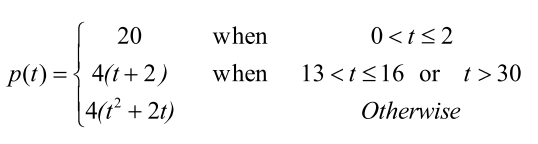
**Students are instructed to write algorithm for the problems in the observation note. In the observation note for each problem record minimum 5 test cases.**

**Also maintain error log**

1. Write a C program to compute the following



1. Write a C program to print the roots of a quadratic equation.
2. Write the complete C program that asks the user to enter the value for t from the keyboard and then it computes and prints the value of p which is expressed as a function of t by



1. Write a program that outputs the day of the week given a date expressed as *j* (day) *m* (month) *a* (year). You will use the following formula:



and with *ns* being the two first digits of *a1* and *as* the two last digits of *a1*



The day of the week will then be given by the modulo of *f* and 7 (0 is Sunday, 1 Monday etc). Let the date be DD/MM/CCYY (european format), where DD is the day of the month, MM is the month, CC the century-digits and YY the year within the century. The for the date 23/06/1994. Starting with the century CC-digits, calculate CC/4 - 2\*CC-1 and remember the result. With all divisions in this exercise, discard any remainder and just keep the whole part. So, in our example, this is 19/4=4 minus 2\*19=38 minus 1, giving minus 35.

Now, using the year YY, calculate 5\*YY/4. In this example that's 5\*94 = 470/4 = 117, discarding the remainder. Adding this to our existing result gives 117-35 = 82.

Using the month MM, calculate 26\*(MM+1)/10. In our example this is 26\*7 = 182 / 10 = 18, again discarding the remainder. Add this to our running total giving 82+18 = 100.

Finally just add the day DD. Here 100 + 23 = 123.

Now divide the result by 7, just **keeping the remainder**; here 123(mod 7) = 4. Counting Sunday as zero, Monday = 1 etc, we get 4 = Thursday. *Easy, when you know how :-)*

1. Write a program to find the biggest among two numbers without using any control structures.
2. Write a C program to print \* in the format given below.

|  |  |  |  |
| --- | --- | --- | --- |
| Right Triangle | Pyramid | Diamond | Right Arrow |
| **http://www.arraypeers.com/files/Editor_images/Capture3.PNG** | http://www.arraypeers.com/files/Editor_images/pattern_figure.PNG | **http://www.arraypeers.com/files/Editor_images/Capture2.PNG** | **http://www.arraypeers.com/files/Editor_images/Capture8.PNG** |

1. Write a program for a matchstick game being played between the computer and a user. Your program should ensure that the computer always wins. Rules for the game are as follows:

− There are 21 matchsticks.

− The computer asks the player to pick 1, 2, 3, or 4 matchsticks.

− After the person picks, the computer does its picking.

− Whoever is forced to pick up the last matchstick loses the game.

1. A number is said to be perfect if it is equal to the sum of all numbers which are its factors (excluding itself). So, for example, 6 is perfect, because it is the sum of its factors 1,2,3. Write a program which determines if a number is perfect. It should also print its factors.
2. Write a program that takes as input a natural number x and prints the smallest palindrome larger than x. A palindrome is a word, number, phrase, or other sequence of characters which reads the same backward as forward, such as madam, racecar. There are also numeric palindromes, including date/time stamps using short digits 11/11/11 11:11 and long digits 02/02/2020.

Input: n = 121  
 Output: Next smallest palindrome of 121 is 131

1. According to a study, the approximate level of intelligence of a person can be calculated using the following formula: i = 2 + ( y + 0.5 x )

Write a program, which will produce a table of values of i, y and x, where y varies from 1 to 6, and, for each value of y, x varies from 5.5 to 12.5 in steps of 0.5.

**Deadline: 19.08.2024**