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PROMBLEMS

1. Write a program that will compute the value of the mathematical expression: x = 3/2 + (5 – 46\*5/12)
2. Write a program that for given value of x will compute and print the value of x^2.
3. 3.Write a program that for a given sides of one triangle, it will print the perimeter and area (values are a = 5, b = 7.5, c = 10.2).
4. Write a program that for given sides of one triangle, it will print the perimeter, semiperimeter and the area of that triangle.
5. 5.Write a program for computing the arithmetic mean of the numbers 3, 5 and 12.
6. 6.Write a program that can calculate the arithmetic mean of 4 numbers
7. 7.Write a program that will print the remainder from the division of number 19 with 2, 3, 5 and 8.
8. 8.Write a program for computing and printing the circle area and perimeter. The circle radius is read as decimal number.
9. 9.Write a program that reads from standard input two integers and prints their sum, difference, product and division remainder
10. 10.Write a program such than when you enter a lowercase letter it will print an uppercase letter.
11. 11.Write a program such that when you enter a number in form of a character it will print the actual number.
12. 12.Write a program such that when you enter 6 number in form of characters it will print their actual sum.
13. 13.Write a program that reads character from SI and depending if it is lowercase or uppercase will print 1 or 0 accordingly.
14. 14.Write a program where you read from SI price of product, and then will print it’s price with calculated with taxes.
15. 15.Write a program where you read from SI price of product, number of installments and interest rate (percents from 0 to 100). The program should output the amount of the installment and total price including the interest.
16. 16.Three three digit numbers are read from the SI. Find the sum of the first digit of the first number, the second digit of the second number and the third digit of the third number.
17. Write a program that computes the average grade of the semester. The program reads 5 integers and should print out the average as a floating point number with two decimal places.
18. 17.Read a three digit integer from SI. Then print the most significant and least significant digit.
19. Write a program that for a given amount of money, will print the minimum bills and coins needed to make the payment. The amount is an integer read from the SI. The result should be printed in 9 lines, the number of bills or coins for each of them.

Example 1583 denars, will be best payed out as:

0 x 5000

1 x 1000

1 x 500

0 x 100

1 x 50

3 x 10

0 x 5

1 x 2

1 x 1

1. 18.Write a program that reads an integer (days) from SI, and on the way out it prints the number of years, months, and days. We assume that all months have 30 days and each year has 365 days.
2. 19.Write a program where from the birth date read from SI (in format ddmmYYYY) would print the month and day of birth.
3. 20.Write a program that uses your personal number to extract your birthday.
4. 21.Write a program that will print the maximum of two number read from SI.
5. 22.Write a program that checks if given year read from SI is leap or not and prints out a appropriate message. The year is leap is divisible by 4 and not divisible by 100, or divisible by 400.
6. The coordinates of a point are read from SI. Write a program that will print out the quadrant or the axis where the point belongs. If the point lays on the origin, print out a appropriate message.
7. Write a program that will generate and print the grade according to the following table:

|  |  |
| --- | --- |
| Points | Grade |
| 0-49 | 5 |
| 50-59 | 6 |
| 60-69 | 7 |
| 70-79 | 8 |
| 80-89 | 9 |
| 90-100 | 10 |

1. Change the previous program, so the sign of the number should be printed (+/-) depending on the last digit of the points number:

|  |  |
| --- | --- |
| Last digit | sign |
| 1-2 | - |
| 3-6 | <blank space> |
| 7-0 | + |

1. Read a number from SI. Then print 1 if the number , if not pritnt 0. The solution should be done by using logical operators(without if else).
2. Read a six digit number from the SI. Then print 1 if the number is a symmetric number, or 0 if it isn’t. A symmetric number is a number where the first digit is equal with the last digit, the second digit is equal with the fifth digit and dhe third digit is equal with the fourth digit.
3. Three numbers are read from SI code, the price and the users balance. Calculate the total price including th VAT which is equal to the last two digits of the code and print 1 if the user has enough money to pay or 0 if he has not.
4. Write a program where a certain amount of money that the user has in his transaction account is entered from the keyboard. Then, five other amounts are entered on a new line, separated by a space. They represent some kind of transaction - a certain expense or gain of money. The program prints 1 if after deleting transactions the user still has money in his account, and 0 otherwise.
5. The following data is read from SI for one student of FINKI:

* index
* six grades from the last semester he listened to

Write a program that will print the following information about the student(see the test examples for the print format):

* average of the student
  + print the average to 3 decimal places
* year of studies
  + students whose index starts at 21 are second year, 20 are third year, 19 are fourth year, etc.
* is it awarded (1=awarded, 0=not awarded)
  + a student is rewarded if he has an average equal to or greater than 9.5.

1. Read from standard input three numbers in arbitrary order. The numbers are lengths of triangle sides. Write a program that will check if triangle can be constructed from given lengths, if so, then should check if the triangle is right triangle and compute its area. On contrary, appropriate messages should be printed.
2. Write a program for simple calculator. The program reads two numbers and operator in format:

num1 operator num2

After the operation, depending on the operator, the result should be printed in format:

num1 operator num2 = result

1. For three segments read from SI, the program should check if a triangle can be formed, then print the kind.
2. For given center of circle and it’s radius the program should determine the quadrants it is overlapping.
3. Milan and marco are playing a 3 round card game. Each round carries a different percentage of the player's total points. First round carries 25%, second round 35% and third round carries 40% of total points. At the input, the points are entered alternately x1, y1, x2, y2, x3, y3 where x are the points of Milan, while y are the points of Marco. In addition, the winner of the game depends on the letter that will be entered in the next line if p is entered the winner is the player with more points, if n is entered the winner is the player with fewer points.).Your task is to print the total points of milan and marco, and in the second line, print who is the winner. If they have the same number of points, there is no winner.
4. For one student, points obtained from 5 activities for one subject are read. A condition for a subject to be passed is to have over 50 points. If the student has 0-50 points he does not pass the subject, if he has 51-60 he passes it with 6, 61-70 he passes it with 7, 71-80 he passes it with 8, 81-90 he passes it with 9 and above 90 he passes it with 10. Print the grade that the student had, his points and to print 1 if there is a requirement to get a higher grade, and otherwise 0.
5. From SI, three numbers are loaded that indicate the times (in minutes) with which three competitors ran 5 km at the Skopje Marathon. To print the sequence number of the fastest competitor. If more than one competitor has the fastest time, the serial numbers of all such competitors are printed.
6. Write a program that for a date read from SI (in the format DD MM YYYY) will print on standard output a message YES if the date is correct and possible, or NO if the date is not correct. When deciding whether the date is correct or not correct, you have to consider the following factors:  
   -is the month between January and December (1-12)  
   -does the number for days correspond with the number of days in the specified month  
   -if the month is February, is the year leap?  
   -Leap years are those years who are divisible with 400, or they are divisible with 4, but not with 100.
7. A number N is read from SI. The program should print on SO “Tik” if the number is divisible by 3, “Tak” if the number is divisible by 5 or “Tik-Tak” if the number is divisible by both 3 and 5. If the number is not divisible by 3 nor 5, than a message “Bad number” should be printed.
8. Write a program that for a three digit number read from SI will check if it is a palindrome or not and will print out an appropriate message. The message is “Palindrome” if it is and “Not palindrome if it is not. If the number is not a three digit number, write a message “Wrong input”.

SOLUTIONS

# 1.

#include **<stdio.h>***//Write a program that will compute the value of the mathematical expression: x = 3/2 + (5 – 46\*5/12)//***int** main(){  
 **float** x=3.0/2 + (5-(46\*5.0/12));  
printf(**"The value of the expression 3/2 + (5 – 46\*5/12) is %.3f\n"**,x);  
 printf(**"3.0/2 + (5 – 46\*5.0/12) = %.3f\n"**, x);  
 **return** 0;  
}

# 2.

#include **<stdio.h>***//Write a program that for given value of x will compute and print the value of x^2.//***int** main(){  
**float** x;  
printf(**"Enter a real number!\n"**);  
scanf(**"%f"**,&x);  
printf(**"%.4f ^ 2 = %.4f"**,x,x\*x);  
 **return** 0;  
}

# 3.

#include **<stdio.h>**#include **<math.h>***//Write a program that for a given sides of one triangle, it will print the perimeter and area (values are a = 5, b = 7.5, c = 10.2)//***int** main(){  
 **float** a=5, b=7.5, c=10.2, Perimeter,s, Area;  
 Perimeter=a+b+c;  
 s=Perimeter/2;  
 Area= sqrtf(s\*(s-a)\*(s-b)\*(s-c));  
 printf(**"The Perimeter of the triangle with sides 5, 7.5 and 10.2 is: %.3f\n"**,Perimeter);  
 printf(**"The Area of the triangle with sides 5, 7.5 and 10.2 is: %.3f\n"**,Area);  
 **return** 0;  
}

# 4.

#include**<stdio.h>**#include **<math.h>***//Write a program that for given sides of one triangle, it will print the perimeter, semiperimeter and the area of that triangle.***int** main() {  
 **float** a,b,c,perimeter,sp,area;  
 printf(**"Enter the sides of the triangle.\n"**);  
 scanf(**"%f%f%f"**,&a,&b,&c);  
 **if**((a+b>c) && (a+c>b) && (b+c>a) && a>0 && b>0 && c>0){  
 perimeter=a+b+c;  
 printf(**"The perimeter of the triangle is: %.2f\n"**,perimeter);  
 sp=perimeter/2;  
 printf(**"The semiperimeter of the triangle is: %.2f\n"**,sp);  
 area= sqrtf(sp\*(sp-a)\*(sp-b)\*(sp-c));  
 printf(**"The area of the triangle is: %.2f\n"**,area);  
 }  
 **else**{  
 printf(**"We cannot form a tiangle withe sides %.2f, %.2f and %.2f\n"**,a,b,c);  
 printf(**"You should follow this rule:\na+b>c && a+c>b && b+c>a where a>0 && b>0 && c>0"**);  
 }  
 **return** 0;  
}

# 5.

#include **<stdio.h>***//Write a program for computing the arithmetic mean of the numbers 3, 5 and 12//***int** main(){  
 **int** a=3, b=5, c=12;  
 **float** average=(a+b+c)/3.0;  
 printf(**"The arithmetic mean of 3, 5, 12 is: %f"**, average);  
 **return** 0;  
}

# 6.

#include **<stdio.h>***//Write a program that can calculate the arithmetic mean of 4 numbers//***int** main(){  
 **float** a, b, c, d;  
 printf(**"Enter your four numbers!\n"**);  
 scanf(**"%f%f%f%f"**,&a,&b,&c,&d);  
 **float** average=(a+b+c+d)/4;  
 printf(**"Your result is: %f"**, average);  
 **return** 0;  
}

# 7.

#include **<stdio.h>***//Write a program that will print the remainder from the division of number 19 with 2, 3, 5 and 8//***int** main(){  
 printf(**"19 %% 2 = %d\n"**,19%2);  
 printf(**"19 %% 3 = %d\n"**,19%3);  
 printf(**"19 %% 5 = %d\n"**,19%5);  
 printf(**"19 %% 8 = %d\n"**,19%8);  
 **return** 0;  
}

# 8.

#include **<stdio.h>***//Write a program for computing and printing the circle area and perimeter. The circle radius is read as decimal number//***int** main(){  
 **float** radius, area, perimeter;  
 printf(**"Enter the length of the radius!\n"**);  
 scanf(**"%f"**, &radius);  
 area=radius\*radius\*3.14;  
 perimeter=2\*radius\*3.14;  
 printf(**"The Area of the circle is: %.2f\n"**, area);  
 printf(**"The Perimeter of the circle is: %.2f\n"**, perimeter);  
 **return** 0;  
}

# 9.

#include **<stdio.h>***//Write a program that reads from standard input two integers and prints their sum, difference, product, division and remainder//***int** main(){  
 **int** a,b;  
 printf(**"Enter two integers!\n"**);  
 scanf(**"%d%d"**, &a, &b);  
 printf(**"%d + %d = %d\n"**,a,b, a+b);  
 printf(**"%d - %d = %d\n"**,a,b, a-b);  
 printf(**"%d \* %d = %d\n"**,a,b, a\*b);  
 printf(**"%d / %d = %.3f\n"**,a,b, (**float**)a/b);  
 printf(**"%d %% %d = %d\n"**,a,b, a%b);  
 **return** 0;  
}

# 10.

#include **<stdio.h>***//Write a program such than when you enter a lowercase letter it will print an uppercase letter//***int** main(){  
 **char** c;  
 printf(**"Enter a lowercase letter!\n"**);  
 scanf(**"%c"**, &c);  
 printf(**"The uppercase letter is:\n"**);  
 printf(**"%c"**, c-32);  
 **return** 0;  
}

# 11.

#include **<stdio.h>***//Write a program such that when you enter a number in form of a character it will print the actual number.//***int** main(){  
 **char** c;  
 printf(**"Enter a number!\n"**);  
 scanf(**"%c"**, &c);  
  
 printf(**"%d"**, c-**'0'**);  
 **return** 0;  
}

# 12.

#include **<stdio.h>***//Write a program such that when you enter 6 number in form of characters it will print their actual sum.//***int** main(){  
 **char** c1,c2,c3,c4,c5,c6;  
 printf(**"Write a six digit number!\n"**);  
 scanf(**"%c%c%c%c%c%c"**, &c1,&c2,&c3,&c4,&c5,&c6);  
 printf(**"The sum of those 6 numbers is:"**);  
 printf(**"%d"**, c1+c2+c3+c4+c5+c6-6\***'0'**);  
 **return** 0;  
}

# 13.

#include **<stdio.h>***//Write a program that reads character from SI and depending if it is lowercase or uppercase will print 1 or 0 accordingly.//***int** main(){  
 **char** c;  
 **int** x;  
 printf(**"Enter your letter!\n"**);  
 scanf(**"%c"**, &c);  
 x=(c>=**'a'**)&&(c<=**'z'**);  
 printf(**"%d"**, x);  
  
 **return** 0;  
}

# 14.

#include **<stdio.h>***//Write a program where you read from SI price of product, and then will print it’s price with calculated with taxes.//***int** main(){  
 **float** price;  
 scanf(**"%f"**, &price);  
 printf(**"The total price with taxes would be: %3f"**, price\*1.18);  
 **return** 0;  
}

# 15.

#include **<stdio.h>***//Write a program where you read from SI price of product, number of installments and interest rate (percents from 0 to 100)//  
// The program should output the amount of the installment and total price including the interest.//***int** main(){  
 **float** price, interest;  
 **int** installments;  
 printf(**"Enter the price of the product.\n"**);  
 scanf(**"%f"**, &price);  
 printf(**"Enter the number of installments.\n"**);  
 scanf(**"%d"**, &installments);  
 printf(**"Enter the interest rate.\n"**);  
 scanf(**"%f"**, &interest);  
 **float** totalPrice=price\*(1+interest/100);  
 printf(**"The installment amount is: %f\n"**, totalPrice/installments);  
 printf(**"The total price is: %f\n"**, totalPrice);  
 **return** 0;  
}

# 16.

#include **<stdio.h>***//Three three digit numbers are read from the SI.//  
// Find the sum of the first digit of the first number, the second digit of the second number and the third digit of the third number.//***int** main(){  
 **int** number1, number2, number3;  
 printf(**"Enter three three digit numbers!\n"**);  
 scanf(**"%d%d%d"**, &number1, &number2, &number3);  
 **int** FirstDigitOfTheFirstNumber, SecondDigitOfTheSecondNumber, ThirdDigitOfTheThirdNumber;  
 FirstDigitOfTheFirstNumber=number1/100;  
 SecondDigitOfTheSecondNumber=(number2/10)%10;  
 ThirdDigitOfTheThirdNumber=number3%10;  
 printf(**"%d + %d + %d = %d"**,FirstDigitOfTheFirstNumber, SecondDigitOfTheSecondNumber, ThirdDigitOfTheThirdNumber,FirstDigitOfTheFirstNumber+SecondDigitOfTheSecondNumber+ThirdDigitOfTheThirdNumber);  
 **return** 0;  
}

# 17.

#include **<stdio.h>***//Write a program that computes the average grade of the semester//  
// The program reads 5 integers and should print out the average as a floating point number with two decimal places.//***int** main(){  
 **int** grade1,grade2,grade3,grade4,grade5;  
 printf(**"Enter your grades!\n"**);  
 scanf(**"%d%d%d%d%d"**,&grade1,&grade2,&grade3,&grade4,&grade5);  
 printf(**"Your average grade for the semester is: %.2f"**,(**float**)(grade1+grade2+grade3+grade4+grade5)/5);  
 **return** 0;

# 18.

#include **<stdio.h>***//Read a three digit integer from SI. Then print the most significant and least significant digit.//***int** main(){  
 **int** number;  
 printf(**"Enter a three digit number\n"**);  
 scanf(**"%d"**, &number);  
 printf(**"The most significant digit is: %d\n"**, number/100);  
 printf(**"The least significant digit is: %d\n"**, number%10);  
 **return** 0;  
}

# 19.

#include **<stdio.h>***//Write a program that for a given amount of money, will print the minimum bills and coins needed to make the payment//  
//The amount is an integer read from the SI. The result should be printed in 9 lines, the number of bills or coins for each of them//  
//Example 1583 denars, will be best payed out as://  
//0 x 5000//  
//1 x 1000//  
//1 x 500//  
//0 x 100//  
//1 x 50//  
//3 x 10//  
//0 x 5//  
//1 x 2//  
//1 x 1//* **int** main(){  
 **int** denars,denarsLeftOut, denars2, denars5, denars10;  
 **int** denars50, denars100, denars500, denars1000, denars5000;  
 scanf(**"%d"**, &denars);  
 denars5000=denars/5000;  
 denars1000=denars%5000/1000;  
 denars500=denars%5000%1000/500;  
 denars100=denars%5000%1000%500/100;  
 denars50=denars%5000%1000%500%100/50;  
 denars10=denars%5000%1000%500%100%50/10;  
 denars5=denars%5000%1000%500%100%50%10/5;  
 denars2=denars%5000%1000%500%100%50%10%5/2;  
 denarsLeftOut=denars%5000%1000%500%100%50%10%5%2;  
 printf(**"%d x %d\n"**,denars5000, 5000);  
 printf(**"%d x %d\n"**,denars1000, 1000);  
 printf(**"%d x %d\n"**,denars500, 500);  
 printf(**"%d x %d\n"**,denars100, 100);  
 printf(**"%d x %d\n"**,denars50, 50);  
 printf(**"%d x %d\n"**,denars10, 10);  
 printf(**"%d x %d\n"**,denars5, 5);  
 printf(**"%d x %d\n"**,denars2, 2);  
 printf(**"%d x %d\n"**,denarsLeftOut, 1);  
 **return** 0;  
}

# 20.

#include **<stdio.h>***//Write a program that reads an integer (days) from SI, and on the way out it prints the number of years, months, and days//  
//We assume that all months have 30 days and each year has 365 days//***int** main(){  
 **int** days, months, years, daysLeft;  
 printf(**"Enter a number of days!\n"**);  
 scanf(**"%d"**, &days);  
 years=days/365;  
 months=days%365/30;  
 daysLeft=days%365%30;  
 printf(**"Years: %d, months: %d, days: %d"**,years, months, daysLeft);  
 **return** 0;  
}

# 21.

#include **<stdio.h>***//Write a program where from the birth date read from SI (in format ddmmYYYY) would print the month and day of birth.//***int** main(){  
 **int** date,day, month, year;  
 printf(**"Write your birth date(in format ddmmYYYY)\n"**);  
 scanf(**"%d"**, &date);  
 day=date/1000000;  
 month=(date/10000)%100;  
 year=date%10000;  
 printf(**"Your birthday date is: %.2d.%.2d.%d"**,day, month, year);  
 **return** 0;  
}

# 22.

#include **<stdio.h>***//Write a program that uses your personal number to extract your birthday//***int** main(){  
 **long long int** PersonalNumber;  
 **int** day, month, year;  
 printf(**"Enter your Personal Number!\n"**);  
 scanf(**"%lld"**, &PersonalNumber);  
 day= PersonalNumber / 100000000000;  
 month= (PersonalNumber / 1000000000) % 100;  
 year= (PersonalNumber / 1000000) % 1000;  
 **if** (year <= 22) {  
 printf(**"From your Personal Number we found out that your birthday date is: %.2d.%.2d.%d"**, day, month, year + 2000);  
 } **else**{  
 printf(**"From your Personal Number we found out that your birthday date is: %.2d.%.2d.%d"**, day, month, year + 1000);  
 }  
 **return** 0;  
}

# 23.

#include **<stdio.h>***//Write a program that will print the maximum of two number read from SI.//***int** main(){  
 **float** a, b;  
 printf(**"Enter two different numbers!\n"**);  
 scanf(**"%f%f"**, &a, &b);  
 **if**(a>b){  
 printf(**"%.2f is the larger number!"**,a);  
 }**else**{  
 printf(**"%.2f is the larger number"**,b);  
 }  
 **return** 0;  
}

# 24.

#include **<stdio.h>***//Write a program that checks if given year read from SI is leap or not and prints out a appropriate message//  
//The year is leap is divisible by 4 and not divisible by 100, or divisible by 400.//***int** main(){  
 **int** year;  
 printf(**"Enter a year!\n"**);  
 scanf(**"%d"**, &year);  
 **if**((year%4==0)&&(year%100!=0)||(year%400==0)){  
 printf(**"Year %d is a leap.\n"**,year);  
 }**else**{  
 printf(**"Year %d is not a leap.\n"**,year);  
 }  
 **return** 0;  
}

# 25.

#include **<stdio.h>***//The coordinates of a point are read from SI. //  
//Write a program that will print out the quadrant or the axis where the point belongs.//  
//If the point lays on the origin, print out a appropriate message.//***int** main(){  
**float** x,y;  
 printf(**"Enter coordinates.\n"**);  
 scanf(**"%f%f"**,&x,&y);  
 **if**(x>0){  
 **if**(y>0){  
 printf(**"I quadrant.\n"**);  
 }  
 **else if**(y<0){  
 printf(**"IV quadrant.\n"**);  
 }  
 **else**{  
 printf(**"Positive x-axis.\n"**);  
 }  
 }  
 **else if**(x<0){  
 **if** (y>0){  
 printf(**"II quadrant.\n"**);  
 }  
 **else if**(y<0){  
 printf(**"III quadrant.\n"**);  
 }  
 **else**{  
 printf(**"Negative y-axis.\n"**);  
 }  
 }  
 **else**{  
 **if**(y>0){  
 printf(**"Positive y-axis.\n"**);  
 }  
 **else if**(y<0){  
 printf(**"Negative y-axis.\n"**);  
 }  
 **else**{  
 printf(**"Origin.\n"**);  
 }  
 }  
 **return** 0;  
}

#include **<stdio.h>**#include **<math.h>***//25. The coordinates of a point are read from SI.  
// Write a program that will print out the quadrant or the axis where the point belongs.  
// If the point lays on the origin, print out a appropriate message.***int** main() {  
 **float** x, y;  
 printf(**"Enter your x and y coordinates.\n"**);  
 scanf(**"%f%f"**, &x, &y);  
 printf(**"Your point is on the "**);  
 **if**(x==0 && y==0){  
 printf(**"Origin"**);  
 **return** 0;  
 }  
 **if**(x==0){  
 printf(**"y-axis"**);  
 **return** 0;  
 }  
 **if**(y==0){  
 printf(**"x-axis"**);  
 **return** 0;  
 }  
 **if**(x>0){  
 **if**(y>0){  
 printf(**"I quadrant"**);  
 }  
 **else**{*//x<0* printf(**"IV quadrant"**);  
 }  
 }  
 **if**(x<0){  
 **if**(y>0){  
 printf(**"II quadrant"**);  
 }  
 **else**{*//y<0* printf(**"III quadrant"**);  
 }  
 }  
 **return** 0;  
}

# 26.

#include **<stdio.h>  
  
int** main(){  
**int** points,grade;  
 printf(**"Enter your points: \n"**);  
 scanf(**"%d"**,&points);  
 **if**(points<0 || points>100){  
 printf(**"Your points are invalid!\n"**);  
 }  
 **else**{  
 **if**(points>90){  
 grade=10;  
 }  
 **else if**(points>80){  
 grade=9;  
 }  
 **else if**(points>70){  
 grade=8;  
 }  
 **else if**(points>60){  
 grade=7;  
 }  
 **else if**(points>50){  
 grade=6;  
 }  
 **else**{  
 grade=5;  
 }  
 printf(**"Your grade is: %d"**,grade);  
 }  
  
 **return** 0;  
}

#include **<stdio.h>***//Write a program that will generate and print the grade according to the following table:  
//Points Grade  
//0-49 5  
//50-59 6  
//60-69 7  
//70-79 8  
//80-89 9  
//90-100 10***int** main() {  
  
 **int** points,grade;  
 printf(**"Enter your points.\n"**);  
 scanf(**"%d"**, &points);  
 grade = points / 10 + 1;  
 **if** (grade <= 5) {  
 grade = 5;  
 }  
 **if** (grade > 10) {  
 grade = 10;  
 }  
 printf(**"Your grade is: %d"**, grade);  
 **return** 0;  
}

*// more complex solution  
// if (points >= 90) {  
// grade = 10;  
// } else if (points >= 80) {  
// grade = 9;  
// } else if (points >= 70) {  
// grade = 8;  
// } else if (points >= 60) {  
// grade = 7;  
// } else if (points >= 50) {  
// grade = 6;  
// } else {  
// grade = 5;  
// }  
//printf("Your grade is: %d", grade);*

# 27.

#include **<stdio.h>  
  
int** main(){  
**int** points,grade;  
 printf(**"Enter your points: \n"**);  
 scanf(**"%d"**,&points);  
 **if**(points<0 || points>100){  
 printf(**"Your points are invalid!\n"**);  
 }  
 **else**{  
 **if**(points>90){  
 grade=10;  
 }  
 **else if**(points>80){  
 grade=9;  
 }  
 **else if**(points>70){  
 grade=8;  
 }  
 **else if**(points>60){  
 grade=7;  
 }  
 **else if**(points>50){  
 grade=6;  
 }  
 **else**{  
 grade=5;  
 }  
 }  
 **char** sign;  
 **int** lastDigit;  
 lastDigit=points%10;  
 **if**(grade!=5){  
 **if**(lastDigit>=0 && lastDigit<=3){  
 sign=**'-'**;  
 }  
 **else if**(lastDigit>=8||lastDigit==0){  
 sign=**'+'**;  
 }  
 printf(**"Your grade is: %d%c"**,grade,sign);  
 }  
  
 **return** 0;  
}

#include **<stdio.h>***//Change the previous program, so the sign of the number should be printed (+/-) depending on the last digit of the points number:  
//Last digit sign  
//0-2 -  
//3-6 <blank space>  
//7-0 +***int** main() {  
  
 **int** points,grade;  
**char** sign;  
printf(**"Enter the number of points.\n"**);  
 scanf(**"%d"**,&points);  
 **int** lastDigit=points%10;  
 **if**(lastDigit<=2){  
 sign=**'-'**;  
 }  
 **if**(lastDigit>=7){  
 sign=**'+'**;  
 }  
 grade=points/10+1;  
 **if**(grade<=5){  
 grade=5;  
 sign=**' '**;  
 }  
 **if**(grade==10){  
 sign=**' '**;  
 }  
 **if**(grade>10){  
 grade=10;  
 sign=**' '**;  
 }  
 printf(**"Your grade is: %d%c"**,grade,sign);

**return** 0;  
}

# 28.

#include **<stdio.h>***// Read a number from SI. Then print 1 if the number x∈(-100,100)∪[200,300), if not pritnt 0.  
// The solution should be done by using logical operators(without if else).***int** main(){  
 **int** x;  
 scanf(**"%d"**,&x);  
 printf(**"%d"**,(x>-100)&&(x<100)||(x>=200)&&(x<300));  
  
 **return** 0;  
}

# 29.

#include **<stdio.h>***//Read a six digit number from the SI. Then print 1 if the number is a symmetric number, or 0 if it isn’t.  
// A symmetric number is a number where the first digit is equal with the last digit,  
// the second digit is equal with the fifth digit and dhe third digit is equal with the fourth digit.***int** main(){  
 **int** x;  
 scanf(**"%d"**,&x);  
 printf(**"%d"**,(x/100000==x%10)&&(x/10000%10==x/10%10)&&(x/1000%10==x/100%10));  
  
 **return** 0;  
}

# 30.

#include **<stdio.h>***//Three numbers are read from SI: code, the price and the users balance.  
// Calculate the total price including th VAT which is equal to the last two digits of the code.  
// Print 1 if the user has enough money to pay or 0 if he has not.***int** main(){  
 **float** price, usersBalance, totalPrice, VAT;  
 **int** code;  
 scanf(**"%d%f%f"**,&code,&price,&usersBalance);  
 VAT=code%100;  
 totalPrice=price\*(1+VAT/100.0);  
 printf(**"The Total price is: %f\n"**,totalPrice);  
 printf(**"%d"**,totalPrice<=usersBalance);  
  
 **return** 0;  
}

# 31.

# 32.

#include **<stdio.h>***//The following data is read from SI for one student of FINKI:  
//- index  
//- six grades from the last semester he listened to  
//Write a program that will print the following information about the student(see the test examples for the print format):  
//- average of the student  
// ν print the average to 3 decimal places  
//- year of studies  
// ν students whose index starts at 21 are second year, 20 are third year, 19 are fourth year, etc.  
//- did he pass (1=pass, 0=fail)  
// ν a student passes if he has an average equal to or greater than 9.5.***int** main() {  
**int** index, g1,g2,g3,g4,g5,g6;  
**float** average;  
 scanf(**"%d%d%d%d%d%d%d"**,&index,&g1,&g2,&g3,&g4,&g5,&g6);  
average=(g1+g2+g3+g4+g5+g6)/6.0;  
 printf(**"Average: %.3f\n"**,average);  
 printf(**"Student: %d\nYear %d\n"**,index,23-(index/10000));  
 printf(**"%d"**,average>=9.5);  
 **return** 0;  
}

# 33.

#include**<stdio.h>**#include **<math.h>***//Read from standard input three numbers in arbitrary order. The numbers are lengths of triangle sides.   
// Write a program that will check if triangle can be constructed from given lengths,  
// if so, then should check if the triangle is right triangle and compute its area.  
// On contrary, appropriate messages should be printed.***int** main() {  
**float** a, b, c, tmp;  
 printf(**"Enter the sides of the triangle.\n"**);  
 scanf(**"%f%f%f"**,&a,&b,&c);  
 **if**(a<=0 || b<=0 || c<=0){  
 printf(**"The sides of the tiangle must be greater than 0"**);  
 **return** 0;  
 }  
 *//1. Check if we can construct a triangle* **if**(a+b>c && a+c>b && b+c>a){  
 *//intermediate step -> sort the numbers in ascending order* **if**(a>b){  
 tmp=b;  
 b=a;  
 a=tmp;  
 }  
 **if**(b>c){  
 tmp=c;  
 c=b;  
 b=tmp;  
 }  
 **if**(a>c){  
 tmp=c;  
 c=a;  
 a=tmp;  
 }  
 *//2. Check whether it's a right triangle* **if**(a\*a+b\*b==c\*c){  
 **float** area=a\*b/2;  
 printf(**"The area of the right triangle is %.2f."**,area);  
 }  
 **else**{  
 printf(**"The triangle is not a right triangle."**);  
 }  
 }  
 **else**{  
 printf(**"You cannot construct a triangle with sides %.2f, %.2f and %.2f.\n"**,a,b,c);  
 printf(**"You should follow this rule:\na+b>c && a+c>b && b+c>a\n"**);  
 printf(**"In this case: %.2f+%.2f>%.2f && %.2f+%.2f>%.2f && %.2f+%.2f>%.2f\n"**,a,b,c,a,c,b,b,c,a);  
 printf(**"Which is fale, because all the cases should be true!"**);  
 }  
  
 **return** 0;  
}

# 34.

#include**<stdio.h>**#include **<math.h>***//Write a program for simple calculator. The program reads two numbers and operator in format:  
// num1 operator num2   
//After the operation, depending on the operator, the result should be printed in format:   
//num1 operator num2 = result***int** main() {  
 **int** a,b;  
 **char** operation;  
 scanf(**"%d%c%d"**,&a,&operation,&b);  
 **switch** (operation) {  
 **case '+'**:  
 printf(**"%d + %d = %d"**,a,b,a+b); **break**;  
 **case '-'**:  
 printf(**"%d - %d = %d"**,a,b,a-b); **break**;  
 **case '\*'**:  
 printf(**"%d \* %d = %d"**,a,b,a\*b); **break**;  
 **case '/'**:  
 **if**(b==0){  
 printf(**"You cannot divide by 0!"**);  
 }**else** printf(**"%d / %d = %.2f"**,a,b,(**float** )a/b); **break**;  
 **case '%'**:  
 **if**(b==0){  
 printf(**"You cannot divide by 0!"**);  
 }**else** printf(**"%d %% %d = %d"**,a,b,a%b); **break**;  
 **default**:  
 printf(**"Invalid operation"**);  
 }  
 **return** 0;  
}

# 35.

#include**<stdio.h>***//For three segments read from SI, the program should check if a triangle can be formed, then print the kind.***int** main() {  
 **float** a, b, c;  
 printf(**"Enter the sides of the triangle.\n"**);  
 scanf(**"%f%f%f"**,&a,&b,&c);  
 **if**((a+b>c) && (a+c>b) && (b+c>a)){  
 printf(**"The triangle can be formed.\n"**);  
 }  
 **else**{  
 printf(**"The triangle can not be formed\n"**);  
 }  
 **return** 0;  
}

# 36.

#include**<stdio.h>**#include**<math.h>***//For given center of circle and it’s radius the program should determine the quadrants  
//it is overlapping.***int** main() {  
 **float** x, y, r;  
 printf(**"Enter the x and y coordinates.\n"**);  
 scanf(**"%f%f"**,&x,&y);  
 printf(**"Enter the radius of the circle\n"**);  
 scanf(**"%f"**,&r);  
 printf(**"The circle with radius %.2f and center C(%.2f, %.2f) overlaps these quadrants:\n"**,r,x,y);  
 **if**(x>0 && y>0){  
 **if**(r<=x && r<=y){  
 printf(**"I"**);  
 }  
 **else if**(r<=x && r>y){  
 printf(**"I and IV"**);  
 }  
 **else if**(r>x && r<=y){  
 printf(**"I and II"**);  
 }  
 **else if**(r>x && r>y && r<= sqrt(x\*x+y\*y)){  
 printf(**"I, II and IV"**);  
 }  
 **else if**(r>x && r>y && r> sqrt(x\*x+y\*y)){  
 printf(**"I, II, III and IV"**);  
 }  
 }  
 **if**(x>0 && y<0){  
 **if**(r<=x && r<=abs(y)){  
 printf(**"IV"**);  
 }  
 **else if**(r<=x && r>abs(y)){  
 printf(**"I and IV"**);  
 }  
 **else if**(r>x && r<=abs(y)){  
 printf(**"III and IV"**);  
 }  
 **else if**(r>x && r>abs(y) && r<= sqrt(x\*x+y\*y)){  
 printf(**"I, III and IV"**);  
 }  
 **else if**(r>x && r>abs(y) && r> sqrt(x\*x+y\*y)){  
 printf(**"I, II, III and IV"**);  
 }  
 }  
 **if**(x<0 && y>0){  
 **if**(r<=abs(x) && r<=y){  
 printf(**"III"**);  
 }  
 **else if**(r<=abs(x) && r>y){  
 printf(**"II and III"**);  
 }  
 **else if**(r>abs(x) && r<=y){  
 printf(**"I and II"**);  
 }  
 **else if**(r>abs(x) && r>y && r<= sqrt(x\*x+y\*y)){  
 printf(**"I, II and III"**);  
 }  
 **else if**(r>abs(x) && r>y && r> sqrt(x\*x+y\*y)){  
 printf(**"I, II, III and IV"**);  
 }  
 }  
 **if**(x<0 && y<0){  
 **if**(r<=abs(x) && r<=abs(y)){  
 printf(**"III"**);  
 }  
 **else if**(r<=abs(x) && r>abs(y)){  
 printf(**"II and III"**);  
 }  
 **else if**(r>abs(x) && r<=abs(y)){  
 printf(**"III and IV"**);  
 }  
 **else if**(r>abs(x) && r>abs(y) && r<= sqrt(x\*x+y\*y)){  
 printf(**"II, III, IV"**);  
 }  
 **else if**(r>abs(x) && r>abs(y) && r> sqrt(x\*x+y\*y)){  
 printf(**"I, II, III and IV"**);  
 }  
 }  
 **if**(x>0 && y==0){  
 **if**(r<=x){  
 printf(**"I and IV"**);  
 }  
 **else if**(r>x){  
 printf(**"I, II, III and IV"**);  
 }  
 }  
 **if**(x<0 && y==0){  
 **if**(r<=abs(x)){  
 printf(**"II and III"**);  
 }  
 **else if**(r>abs(x)){  
 printf(**"I, II, III and IV"**);  
 }  
 }  
 **if**(x==0 && y>0){  
 **if**(r<=y){  
 printf(**"I and II"**);  
 }  
 **else if**(r>y){  
 printf(**"I, II, III and IV"**);  
 }  
 }  
 **if**(x==0 && y<0){  
 **if**(r<=abs(y)){  
 printf(**"III and IV"**);  
 }  
 **else if**(r>abs(y)){  
 printf(**"I, II, III and IV"**);  
 }  
 }  
 **if**(x==0 && y==0){  
 printf(**"I, II, II and IV"**);  
 }  
 **return** 0;  
}

#include**<stdio.h>**#include **<math.h>  
int** main() {  
 **float** x, y;  
 **float** radius;  
 **int** q1 = 0, q2 = 0, q3 = 0, q4 = 0;  
 scanf(**"%f %f %f"**, &x, &y, &radius);  
  
 **if** (x == 0 && y == 0) {  
 printf(**"1111"**);  
 **return** 0;  
 }  
  
 **if** (x > 0 && y > 0) {*//I* **if**(radius<=y){  
 q1 = 1;  
 }  
 **if** (radius > y) {  
 q4 = 1;  
 }  
 **if** (radius > x) {  
 q2 = 1;  
 }  
 **if** (radius\*radius > (x\*x)+(y\*y)){  
 q3=1;  
 }  
 }  
 **if** (x > 0 && y < 0) {*//IV* **if**(radius<=abs(y)){  
 q4 = 1;  
 }  
 **if** (radius > abs(y)) {  
 q1 = 1;  
 }  
 **if** (radius > x) {  
 q3 = 1;  
 }  
 **if** (radius\*radius > (x\*x)+(y\*y)){  
 q2=1;  
 }  
 }  
 **if** (x < 0 && y > 0) {*//II* **if**(radius<=y ){  
 q2 = 1;  
 }  
 **if** (radius > y) {  
 q3 = 1;  
 }  
 **if** (radius > abs(x)) {  
 q1 = 1;  
 }  
 **if** (radius\*radius > (x\*x)+(y\*y)){  
 q4=1;  
 }  
 }  
 **if** (x < 0 && y < 0) {*//III* **if**(radius<=abs(y)){  
 q3 = 1;  
 }  
 **if** (radius > abs(y)) {  
 q2 = 1;  
 }  
 **if** (radius > abs(x)) {  
 q4 = 1;  
 }  
 **if** (radius\*radius > (x\*x)+(y\*y)){  
 q1=1;  
 }  
 }  
 printf(**"%d%d%d%d"**,q1,q2,q3,q4);  
 **return** 0;  
}

# 37.

#include **<stdio.h>***//milan and marco are playing a 3 round card game. Each round carries a different percentage of the player's total points.  
// First round carries 25%, second round 35% and third round carries 40% of total points.  
// At the input, the points are entered alternately x1, y1, x2, y2, x3, y3 where x are the points of Milan,  
//while y are the points of Marco.  
// In addition, the winner of the game depends on the letter that will be entered in the next line  
// (if p is entered the winner is the player with more points, if n is entered the winner is the player with fewer points.).  
// Your task is to print the total points of milan and marco, and in the second line, print who is the winner.  
// If they have the same number of points, there is no winner.***int** main () {  
 **float** x1,x2,x3,y1,y2,y3;  
 printf(**"Enter the points\n"**);  
 scanf(**"%f %f %f %f %f %f\n"**,&x1,&y1,&x2,&y2,&x3,&y3);  
 printf(**"Enter 'p' or 'n'.\n"**);  
 **char** c;  
 scanf(**"%c"**,&c);  
  
 **float** MilanPoints=x1\*25/100.0+x2\*35/100.0+x3\*40/100.0;  
 **float** MarcoPoints=y1\*25/100.0+y2\*35/100.0+y3\*40/100.0;  
 printf(**"%.2f %.2f\n"**,MilanPoints, MarcoPoints);  
 **if**(MilanPoints==MarcoPoints){  
 printf(**"There is no winner.\n"**);  
 }  
 **else**{  
 **switch** (c) {  
 **case 'p'**:{  
 **if**(MilanPoints>MarcoPoints){  
 printf(**"Milan is the winner.\n"**);  
 }  
 **else** {  
 printf(**"Marco is the winner.\n"**);  
 }  
 }  
 **break**;  
 **case 'n'**:{  
 **if**(MilanPoints<MarcoPoints){  
 printf(**"Milan is the winner.\n"**);  
 } **else**{  
 printf(**"Marco is the winner.\n"**);  
 }  
 }  
  
 }  
 }  
  
}

# 38.

#include **<stdio.h>***//for one student, points obtained from 5 activities for one subject are read.  
// A condition for a subject to be passed is to have over 50 points.  
// If the student has 0-50 points he does not pass the subject,  
// if he has 51-60 he passes it with 6, 61-70 he passes it with 7, 71-80 he passes it with 8,  
// 81-90 he passes it with 9 and above 90 he passes it with 10.  
// Print the grade that the student had, his points and to print 1 if there is a requirement to get a higher grade,  
// and otherwise 0.  
// There is a requirement for a higher grade only if 1 point is missing from getting a higher grade  
//51-60 - 6  
//61-70 - 7  
//71-80 - 8  
//81-90 - 9  
//91- - 10***int** main () {  
 **int** a1,a2,a3,a4,a5, grade;  
 scanf(**"%d%d%d%d%d"**,&a1,&a2,&a3,&a4,&a5);  
 **int** points=a1+a2+a3+a4+a5;  
 **if**(points<=50){  
 printf(**"Failed"**);  
 } **else**{  
 **if**(points>=51 && points<=60){  
 grade=6;  
 }  
 **if**(points>=61 && points<=70){  
 grade=7;  
 }  
 **if**(points>=71 && points<=80){  
 grade=8;  
 }  
 **if**(points>=81 && points<=90){  
 grade=9;  
 }  
 **if**(points>=91){  
 grade=10;  
 }  
 }  
 printf(**"Grade: %d, points: %d\n%d"**,grade,points,(points%10==9));  
  
 }

# 39.

#include **<stdio.h>***//from SI, three numbers are loaded that indicate the times (in minutes) with which three competitors ran 5 km  
// at the Skopje Marathon.  
//To print the sequence number of the fastest competitor.  
// If more than one competitor has the fastest time, the serial numbers of all such competitors are printed.***int** main () {  
 **float** c1,c2,c3;  
 scanf(**"%f%f%f"**, &c1,&c2,&c3);  
 **int** competitor1=0, competitor2=0, competitor3=0;  
 **if**(c1==c2 && c1==c3 && c2==c3){  
 printf(**"123"**);  
 **return** 0;  
 }**else**{  
 **if**(c1<c2 && c1<c3){  
 competitor1=1;  
 printf(**"%d"**,competitor1);  
 }  
 **if**(c2<c1 && c2<c3){  
 competitor2=2;  
 printf(**"%d"**,competitor2);  
 }  
 **if**(c3<c2 && c3<c1){  
 competitor3=3;  
 printf(**"%d"**,competitor3);  
 }  
 **if**(c1==c2 && c1<c3 && c2<c3){  
 competitor2=2;  
 competitor1=1;  
 printf(**"%dd"**,competitor1,competitor2);  
 }  
 **if**(c1==c3 && c1<c2 && c3<c2){  
 competitor3=3;  
 competitor1=1;  
 printf(**"%dd"**,competitor1,competitor3);  
 }  
 **if**(c3==c2 && c3<c1 && c2<c1){  
 competitor2=2;  
 competitor1=1;  
 printf(**"%dd"**,competitor2,competitor3);  
 }  
 }  
 }

# 40.

#include **<stdio.h>***//Write a program that for a date read from SI (in the format DD MM YYYY) will print on standard output  
// a message YES if the date is correct and possible, or NO if the date is not correct.  
//When deciding whether the date is correct or not correct, you have to consider the following factors:  
  
//is the month between January and December (1-12)  
//does the number for days correspond with the number of days in the specified month  
//if the month is February, is the year leap?  
//Leap years are those years who are divisible with 400, or they are divisible with 4, but not with 100  
//For example:***int** main () {  
 **int** date, day,month,year;  
 scanf(**"%d"**,&date);  
  
 day=date/1000000;  
 month=(date/10000)%100;  
 year=date%10000;  
  
 **if**( (month>=1 && month<=12)){  
 **if**(day>=1 &&day<=31 && (month==1 || month==3 || month==5 || month==7 || month==8 || month==10 || month==12)){  
 printf(**"YES"**);  
 }  
 **else if**(day>=1 && day<=30 && (month==4 || month==6 || month==9 || month==11)){  
 printf(**"YES"**);  
 }  
 **else if**(day>=1 && day<=28 && month==2){  
 printf(**"YES"**);  
 }  
 **else if**(day==29 && month==2 && ((year%4==0 && year%100!=0) || year%400==0)){  
 printf(**"YES"**);  
 } **else**{  
 printf(**"NO"**);  
 }  
  
 }**else**{  
 printf(**"NO"**);  
 }  
}

# 41.

#include **<stdio.h>***//A number N is read from SI. The program should print on SO “Tik” if the number is divisible by 3,  
// “Tak” if the number is divisible by 5 or “Tik-Tak” if the number is divisible by both 3 and 5.  
// If the number is not divisible by 3 nor 5, than a message “Bad number” should be printed.***int** main () {  
 **int** N;  
 scanf(**"%d"**,&N);  
 **if**(N%3==0 && N%5==0){  
 printf(**"Tik-Tak"**);  
 } **else if**(N%3==0 && N%5!=0){  
 printf(**"Tik"**);  
 } **else if**(N%3!=0 && N%5==0){  
 printf(**"Tak"**);  
 } **else**{  
 printf(**"Bad number"**);  
 }  
}

# 42.

#include **<stdio.h>***//Write a program that for a three digit number read from SI will check if it is a palindrome or not and  
// will print out an appropriate message. The message is “Palindrome” if it is and “Not palindrome if it is not.  
// If the number is not a three digit number, write a message “Wrong input”.***int** main () {  
 **int** number;  
 scanf(**"%d"**, &number);  
 **if**(number>=100 && number<1000){  
 **if**(number/100==number%10){  
 printf(**"Palindrome"**);  
 } **else**{  
 printf(**"Not palindrome"**);  
 }  
 } **else**{  
 printf(**"Wrong input"**);  
 }  
}