

Programming Assignment - 5  
Due Friday October 15<sup>th</sup> , 2021  
9:15 am Section 001  
10:15 am Section 002

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Write a C++ program that accepts a **positive** integer number from the keyboard. The purpose of the program is to:

- Determine whether the number is prime or not prime. Prime number is a number that is divisible by itself and one only such 2, 3, 5, 7, 11, 13 ...
- find and the display all the square pair numbers between 1 and that number. The user should be able to repeat the process until he/she enters n or N to terminate the process and the program.

Square numbers are certain pairs of numbers when added together give a square number and when subtracted also give a square number. For example, the numbers 8 and 17

$$8 + 17 = 25 \text{ ( a square )}$$

$$17 - 8 = 9 \text{ ( a square )}$$

So, 8 and 17 are square pair numbers.

**Sample Run - Your program must produce the following output wording and format:**

Math By Computers

Prime number is a number that is divisible by itself and one only such  
2, 3, 5, 7, 11, 13 ...

Square numbers are certain pairs of numbers when added together  
give a square number and when subtracted also give a square number.  
This program displays all the pairs of numbers .

Enter a number ---- > : 100

100 is Not Prime

The square pair numbers are :-

N	P	N + P	P – N
-----			
.			
.			
.			
4	5	9	1
6	10	16	4
8	17	25	9
10	26	36	16
12	13	25	1
12	37	49	25
.			
.			
.			
80	89	169	9
84	85	169	1
96	100	196	4

Would you like repeat the process for another number ?

Enter Y , y or N , n -----> Y

Enter a number ---- > : 10

10 is not a Prime Number

The square pair numbers are :-

N	P	N + P	P – N
4	5	9	1
6	10	16	4

Would you like repeat the process for another number ?

Enter Y , y or N , n -----> y

Enter a Number -----> : -10

invalid Number , Number must be positive

Would you like repeat the process for another number ?

Enter Y or y , N or n ---> P

invalid choice , Must enter Y, y or N , n

Would you like repeat the process for another number ?

Enter Y or y , N or n ---> n

Prime & Square numbers  
Prepared by Husain Ghooloom

Computers, INC.  
10 - 15 - 2021

**Style:**

Your Program must include the following as **comments** on the top before the start of your program:

```
// Due Date
// Programming Assignment Number 5
// Fall 2021 - CS 1428 - Section Number
// Instructor: Husain Gholoom.
//
// <Brief description of the purpose of the program>
```

**Variable names :**

Must be meaningful.

The initial letter should be lowercase, following words should be capitalized, no other caps or punctuation ( i.e. `weightInPounds` ).

Each variable must be declared on a separate line with a descriptive comment.

**Named constants :**

Use for most numeric literals.

All capitals with underscores ( i.e. `TX_STATE_SALES_TAX` )

Should occur at top of function, or global (only if necessary)

**Line length** of source code should be no longer than 80 characters (no wrapping of lines).

### **Indentation :**

Use 2-4 spaces (but be consistent throughout your program).

Indent blocks, within blocks, etc.

Use blank lines to separate sections.

### **Comments for variables :**

All variable definitions should be commented as follows:

```
int  gender;      // integer value for the gender,  
                  // 1 = Male ,  
                  // 2 = Female ,
```

**Rules:**

1. Your program **must compile** and run using Code::Blocks 20.03 IDE.
2. Not allowed to use any concepts that was not discussed in the class such as iterations such as functions ... etc.
3. Must follow the coding style guidelines
4. You can use **for** , **while** , **or do .. while** along with **if .. else** statements.
5. You must use the appropriate libraries in writing this program.
6. Must properly **format** the output by use the appropriate library.

**See the output above. Note that in the following 2 lines:**

**Prepared by Husain Gholoom**

**10 - 5 - 2021**

- **Replace my first / last name with your own first / last name.**
- **Replace the date 10 – 5 – 2021 to be the due date of your program.**

7. You must name your program as :

**F21\_HW5\_XXXXXX\_YYYYYY\_1428\_1.cpp ( for Section number 1 )**

**F21\_HW5\_XXXXXX\_YYYYYY\_1428\_2.cpp ( for Section number 2 )**

**Where XXXXX is your First Name and YYYYYY is your Last Name. For example, the file name should look something like:**

**F21\_HW5\_Husain\_Gholoom\_1428\_1.cpp ( not .cbp )**



8. You must upload your programs no later than the starting of class time on the due date. **No late assignments will be accepted regardless of the reason and a grade of zero will be assigned**

## Use Canvas To upload your program

9. **Maximum points for this assignment are 10. Points will be deducted if:**

- Incorrect file format such as uploading .cbp instead of .cpp or missing electronic version ( - 10 points)
- Compilation Errors, using any concepts that was not discussed in the class ( - 8 points )
- Logical Error ( at least - 1 point )
- Incorrect program name, Incorrect Output / Output format , Missing or incorrect comments on top of the program , not replacing my first and last name with your first and last name , not replacing XXXXXX and YYYYYYY with your first and last name , Missing / Incorrect header , Missing / Incorrect footer, Not following the coding style guidelines, missing program documentation ( at least - 0.75 point each )