**Subject: PRF192- PFC**

**Workshop 04**

**Objectives:**

1. Managing data using pointers
2. Developing programs using simple menus

**Part 1: Use notebook**

**Exercise 1** (1 mark) : Explain outputs:

\*pn = 6+2\*6-3\*7 = -3 ; \*pm = 6 - -3 = 9; m+n = -3 + 9 = 6.

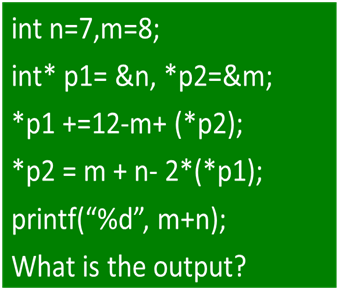
\*p1 = c1 = ‘D’, \*p2 = c2 = ‘A’,c1 – c2 = 68-65 = 3.

\*p1 = 3.2 + 3 – 2\*5.1 = -4; \*p2 = 5.1 – 3\*(-4) = 17.1; x+y = -4 + 17.1 = 13.1

**Exercise 2: (1 marks) What are outputs**

\*p1 = 7 + 12 – 8 + 8 = 19; \*p2 = 8 + 19 – 2\*19 = -11; m + n = 19 + -11 = 8

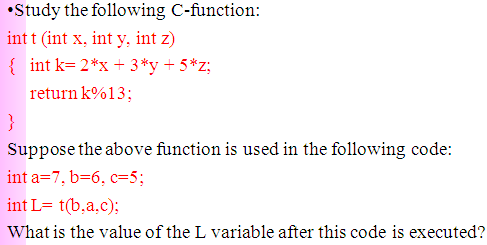
\*p1 = 7 + 12 – 8 + 8 = 19; \*p2 = 8 + 19 – 2\*19 = -11; m + n = 19 + -11 = 8



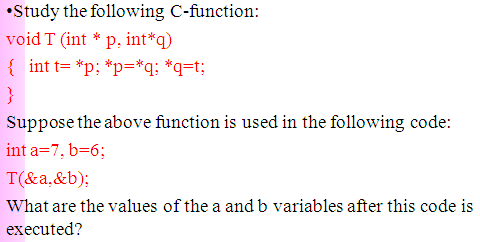
A screenshot of a computer code

Description automatically generatedn= 260; n = 256

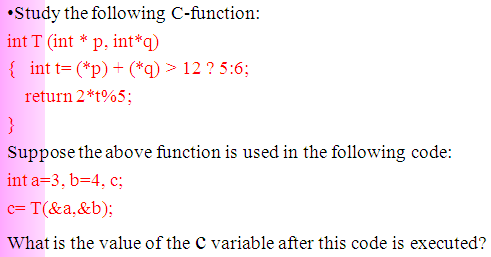
**Exercise 3: (2 marks) Walkthroughs**



L = (2\*6 + 3\*7 + 5\*5) % 13 = 6



a = 6, b =7



c = 2\*6%5 = 2

**Part 2: Develop a program using simple menu**

**Program 1(3 marks):**

|  |  |
| --- | --- |
| **Objectives** | Practice implementing a program with simple menu. |
| **Related knowledge** | None |
| **Problem** | Write a C program that will execute repetitively using a simple menu as following:   1. **Process primes** 2. **Print min, max digit in an integer;** 3. **Quit**   **Select an operation:**   1. When user selects the option 1, the program will accept a positive integral number and print out a message about whether the input number is a prime or not. 2. When user selects the option 2, the program will accept a positive integral number and print out the minimum and maximum digit in this number. 3. The program will terminate when user selects the option 3. |
| **Analysis** | **Nouns:**  - positive integral number 🡪 **int n**  - A number represents a choice of user 🡪 **int choice;**  **Functions**:  **int prime( int n) 🡪 see above**  **void printMinMaxDigits( int n) 🡪 see above** |
| **Suggested algorithm (logical order of verbs)** | Begin  Do /\* Print out the menu and get user choice\*/  { Print out “1- Process primes\n”;  Print out “2- Print min, max digit in an integer \n”;  Print out “3- Quit\n”;  Print out “Select an operation:”;  switch(choice)  { case 1: do  { Input n;  }  while(n<0);  If ( prime(n)==1) Print “ It is a prime\n”;  Else Print “ It is not a prime\n”;  break;  case 2: do  { Input n;  }  while(n<0);  printMinMaxDigits( int n) ;  break;  }  }  while ( choice >0 & choice<3);  End |

**Program 2(3 marks): ( refer to the workshop 2 for algorithms)**

Write a C program that will execute repetitively using a simple menu as following:

**1-Fibonacci sequence**

**2-Check a date**

**3-Quit**

**Choose an operation:**

1- When the option 1 is selected, the program will accept a positive integral number, called as n, then the first n Fibonacci numbers will be printed out

2- When the option 2 is selected, the program will accept a date then the program will tell that whether this data is valid or not.

3- If the option 3 is selected, the program quits

**More Programs**

You can pick 2 or 3 functions in the workshop 2, associate them to a new program.