Test N°1

Full Name
Groupe :

Exercise 01:

Consider the following C program:

```
#include <stdio.h>
int main() {
   int width, height, totalPixels, i;
   int pixelValue, negativeValue;
   // Read the image dimensions
   printf("Enter the image width (in pixels): ");
   scanf("%d", &width);
   printf("Enter the image height (in pixels): ");
   scanf("%d", &height);
   totalPixels = width * height;
   printf("The image contains %d pixels.\n", totalPixels);
   // Read each pixel value and calculate the negative
   for (i = 1; i <= totalPixels; i++) {
      // Force the user to enter a value between 0 and 255
      do {
         printf("Enter the value of pixel %d (between 0 and 255): ", i);
         scanf("%d", &pixelValue);
                }
      } while (pixelValue < 0 || pixelValue > 255);
      negativeValue = 255 - pixelValue;
      printf ("Pixel %d its negative = %d\n", i, negativeValue);
   }
      return 0;
}
```

Questions:

1. What will be displayed on the screen if the user enters **2** for the width and **2** for the height of the image? Then the user enters values for each pixel, for example: pixel 1 = 128, pixel 2 = 100, pixel 3 = 255, and so on for the remaining pixels.
2. What does this program do?
3. If we want to calculate the same values for **multiple images**, what changes should be made to the program?

Questions:

1. Que sera-t-il affiché à l'écran si l'utilisateur saisit **2 pour la largeur** et **2 pour la hauteur** de l'image ?
   Ensuite, l'utilisateur entre les valeurs pour chaque pixel, par exemple :
   - pixel 1 = 128
   - pixel 2 = 100
   - pixel 3 = 255 , et ainsi de suite pour les pixels suivants
2. Que fait ce programme ?
3. Si nous voulons calculer les mêmes valeurs pour **plusieurs images**, quels changements faudrait-il apporter au programme ?

1- **The output will be :**
   -
   -
   -
   -
   -
   -
   -
   -
   -
   -
   -

2- **This program calculates :**
   -
   -
   -

3- **Changes should be made :**
   -
   -
   -
   -

Draft = Brouillon = المسودة ↓

Test N°1

Full Name
Groupe :

Exercise 01 :

Write aC program or Algorithm that asks the user to enter a **PIN code**.(" The PIN code must be exactly **4 digits**")
The program should:

1. Ensure that the PIN has **exactly 4 digits**.
2. Ensure that the PIN contains **at least one even digit and at least one odd digit**.
3. **Repeat the input** if the PIN does not meet these conditions.
4. Display:
   - `"PIN valid"` if the conditions are met.
   - `"Weak PIN: it must contain at least one even digit and one odd digit"` otherwise.

// **Fr :** Écrire un programme en C ou un algorithme qui demande à l'utilisateur de saisir un **code PIN à 4 chiffres**.
Le programme doit :

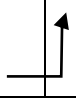
1. Vérifier que le PIN contient exactement **4 chiffres**.
2. Vérifier que le PIN contient **au moins un chiffre pair et au moins un chiffre impair**.
3. **Répéter la saisie** si le PIN ne respecte pas ces conditions.
4. Afficher :
   - `"PIN valide"` si les conditions sont respectées.
   - `"PIN faible : il doit contenir au moins un chiffre pair et un chiffre impair"` sinon.//

Solution

Draft = Brouillon = المسودة ↓

Draft = Brouillon = المسودة ↓

Solution



Solution 1:

```
#include <stdio.h>
#include <stdbool.h>
int main() {
   bool Even = false;
   bool Odd = false;
   int pin, digit,temp,count;
   do {
      // Saisie du PIN (4 chiffres)
      do {
         printf("Enter an PIN  code in 4 digits between 1000 and 9999 : ");
         scanf("%d", &pin);
      } while (pin < 1000 || pin > 9999);   // boucle pour vérifier 4 chiffres
      // Initialisation pour vérification pair/impair
      temp = pin;
      Even = 0;
        Odd = 0;
      // Vérification chiffre par chiffre
      for (count = 0; count < 4; count++) {
          digit = temp % 10;
         if (digit % 2 == 0)
            Even = true;
         else
            Odd = true;
         temp /= 10;
      }
      // Si le PIN doesn't contain at least one even digit and one odd digit
      if (!(Even && Odd))
         printf("Weak PIN: it must contain at least one even digit and one odd digit.\n");
   } while (!(Even && Odd)); // répéter tant que la condition odd+even n'est pas satisfaite
   // final result
   printf("PIN valid\n");
   return 0;
}
```

Solution 2:

```
#include <stdio.h>
int main() {
   int a, b, c, d;
   int Even, Odd;
   /* ---- Saisie des 4 chiffres ---- */
   do{
      printf("Enter four digits between 0 and 9:\n");
      scanf("%d %d %d %d", &a, &b, &c, &d);
     while (a < 0 || a > 9 ||
          b < 0 || b > 9 ||
          c < 0 || c > 9 ||
          d < 0 || d > 9)
         {
          printf("Invalid digit! All digits must be between 0 and 9.\n\n");
          scanf("%d %d %d %d", &a, &b, &c, &d);
          }
   /* ---- Vérification pair/impair ---- */
   Even = 0;
   Odd  = 0;
   if (a % 2 == 0 || b % 2 == 0 || c % 2 == 0 || d % 2 == 0)
      Even = 1;
```

```
    if (a % 2 != 0 || b % 2 != 0 || c % 2 != 0 || d % 2 != 0)
        Odd = 1;
    /* ---- Résultat final ---- */
    if (Even != 1 || Odd != 1)
        printf("Weak PIN: it must contain at least one even digit and one odd digit.\n");
    }while (Even != 1 || Odd != 1) ;
     printf("PIN valid.\n");
    return 0;
}
```

SOLUTION 3

```
#include <stdio.h>
int main() {
    int a, b, c, d;
    int Even, Odd;
    /* ---- Saisie des 4 chiffres ---- */
    do{
        printf("Enter four digits between 0 and 9 and at least one even and one odd:\n");
        scanf("%d %d %d %d", &a, &b, &c, &d);
       }while ((a < 0 || a > 9 ||
            b < 0 || b > 9 ||
            c < 0 || c > 9 ||
             d < 0 || d > 9)||(a%2==0 && b%2==0 && c%2==0 && d%2==0) || (a%2!=0 && b%2!=0 && c%2!=0 &&
d%2!=0));

     printf("PIN valid.\n");

    return 0;
}
```

Exercise 1:

```
Enter the image width (in pixels): 2
Enter the image height (in pixels): 2
The image contains 4 pixels.
Enter the value of pixel 1 (between 0 and 255): 44
Pixel 1 its  negative = 211
Enter the value of pixel 2 (between 0 and 255): 55
Pixel 2 its  negative = 200
Enter the value of pixel 3 (between 0 and 255): 6
Pixel 3 its  negative = 249
Enter the value of pixel 4 (between 0 and 255): 3
Pixel 4 its  negative = 252
```

2. this program Reads the dimensions of an image (width and height and prints the negative value for each pixel..

3. we add the loop for :

```
int i, nbr ;// number of images

printf(" enter the number of images \n");

Scanf("%d",&nbr);

for (i = 1; i <= nbr; i++) {

previuous program }
```