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**Group : D**

**Practical - 17B**

**Code :**

#include<stdio.h>

#include<math.h>

#include<stdlib.h>

#include<time.h>

void input(int data[], int n)

{

int i;

for (i = 0; i < n; i++)

{

scanf("%d", &data[i]);

}

}

float mean(int data[], int n)

{

int sum = 0, i;

float avg;

for (i = 0; i < n; i++)

{

sum += data[i];

}

avg = (float)sum / n; // Cast sum to float to ensure floating-point division

return avg;

}

float var(int data[], int n)

{

int sum\_sq = 0, i;

float mu, variance;

mu = mean(data, n);

for (i = 0; i < n; i++)

{

sum\_sq += (data[i] - mu) \* (data[i] - mu);

}

variance = (float)sum\_sq / (n - 1); // Cast to float for precision

return variance;

}

float t\_test(int A[], int B[], int n1, int n2)

{

float mu1 = mean(A, n1);

float mu2 = mean(B, n2);

float s1 = var(A, n1);

float s2 = var(B, n2);

float num = (mu1 - mu2);

float pooled\_s = sqrt(((s1 \* (n1 - 1)) + (s2 \* (n2 - 1))) / (n1 + n2 - 2));

float denom = pooled\_s \* sqrt((1.0 / n1) + (1.0 / n2));

float t\_statistic = num / denom;

return t\_statistic;

}

int main()

{

int A[50], B[50], n1, n2;

float t;

printf("Enter number of observation of weights of animals for food A: ");

scanf("%d", &n1);

printf("Enter number of observation of weights of animals for food B: ");

scanf("%d", &n2);

printf("Enter the observation of weights of animals for food A:\n");

input(A, n1);

printf("Enter the observation of weights of animals for food B:\n");

input(B, n2);

t = t\_test(A, B, n1, n2);

printf("The value of the test statistic is: %f", t);

if (fabs(t) < 1.761) // Use fabs for floating-point absolute value

{

printf("\nWe fail to reject the null hypothesis and conclude that both foods have the same effect.\n");

}

else

{

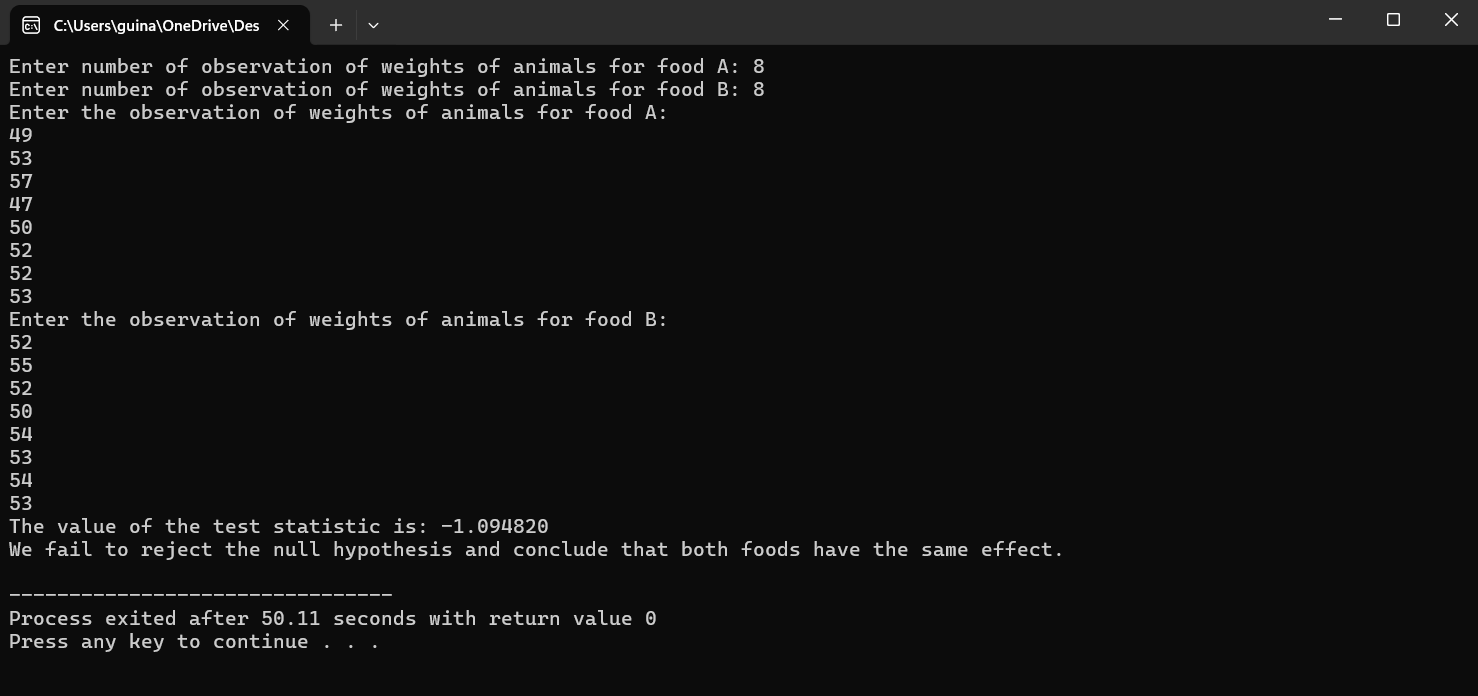
printf("\nWe reject the null hypothesis and conclude that food B and food A have significant differences in their effects.\n");

}

return 0;

}

**OUTPUT :**

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