ASSIGNMENT

Deriving Direct Runoff Hydrograph (DRH) from UH due to storm by code in C language.

```
#include <stdio.h>
#include <stdlib.h>
int main(void)
{
int nU, nR;
printf("Enter number of Unit Hydrograph ordinates (nU): ");
if (scanf("%d", &nU) != 1 || nU <= 0) {
fprintf(stderr, "Invalid nU.\n");
return 1;
}
printf("Enter number of Effective Rainfall Hytograph (cm) (nR): ");
if (scanf("%d", &nR) != 1 || nR <= 0)
{
fprintf(stderr, "Invalid nR.\n");
return 1;
}
double *UH = (double*)calloc(nU, sizeof(double));
double *R = (double*)calloc(nR, sizeof(double));
if (!UH || !R)
{
fprintf(stderr, "failed.\n");
free(UH); free(R);
return 1;
}
printf("Enter %d UH ordinates :\n", nU);
for (int i = 0; i < nU; ++i)
{
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if (scanf("%lf", &UH[i]) != 1)
{
fprintf(stderr, "Failed [%d].\n", i);
free(UH); free(R);
return 1;
}}
printf("Enter %d ERH pulses (excess rainfall in cm for each step):\n", nR);
for (int i = 0; i < nR; ++i)
{
if (scanf("%lf", &R[i]) != 1)
{
fprintf(stderr, "Failed to read R[%d].\n", i);
free(UH); free(R);
return 1;
}}
int nD = nU + nR - 1;
double *DRH = (double*)calloc(nD, sizeof(double));
if (!DRH)
{
fprintf(stderr, "failed.\n");
free(UH); free(R);
return 1;
}
for (int i = 0; i < nR; ++i)
{
for (int j = 0; j < nU; ++j) {
DRH[i + j] += R[i] * UH[j];
}}
printf("\nIndex\tDRH\n");
for (int t = 0; t < nD; ++t)
{
```

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printf("%d\t%.6f\n", t+1, DRH[t]);
}
free(UH);
free(R);
free(DRH);
return 0;
}
```

INPUT - 0 50 125 185 160 110 60 36 25 16 8 0

2 6 4

OUTPUT - 15 115 565 1335 1945 1935 1435 887 521 341 227 127 47 15