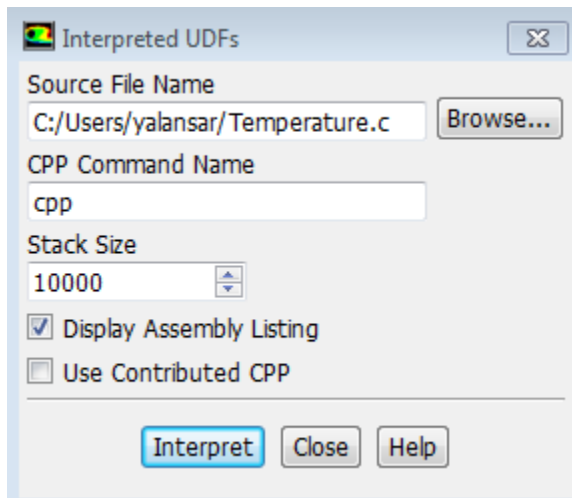


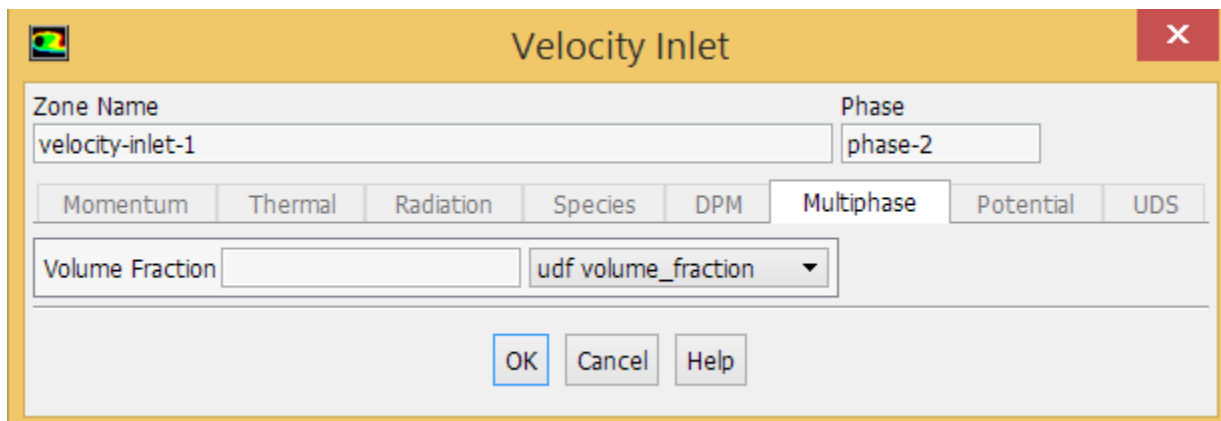
Yousif Alansari  
MAE598 Challenge 3  
No Collaboration

**Setup:**

The written C code for the UDF was imported into Fluent using the interpret UDF option.

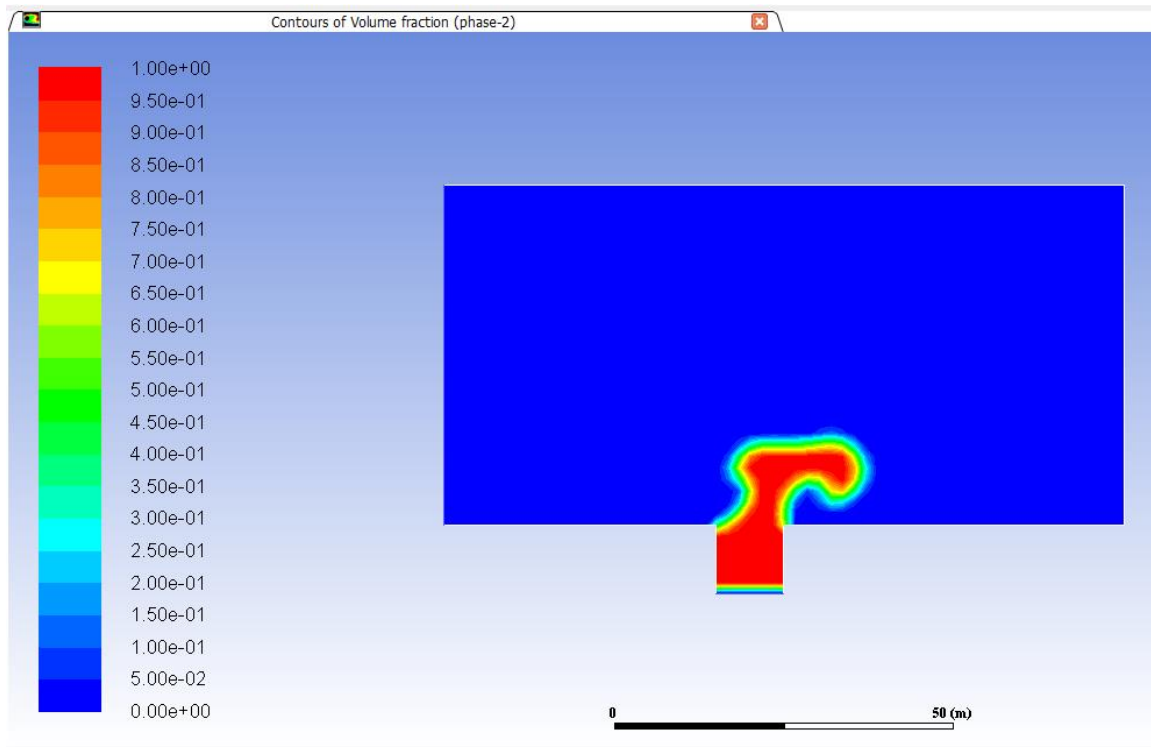


After the UDF was entered into Fluent, it was accessible from the boundary conditions for the phase 2 for the velocity inlet. The rest of the set up was the same as Case B in Task 3.

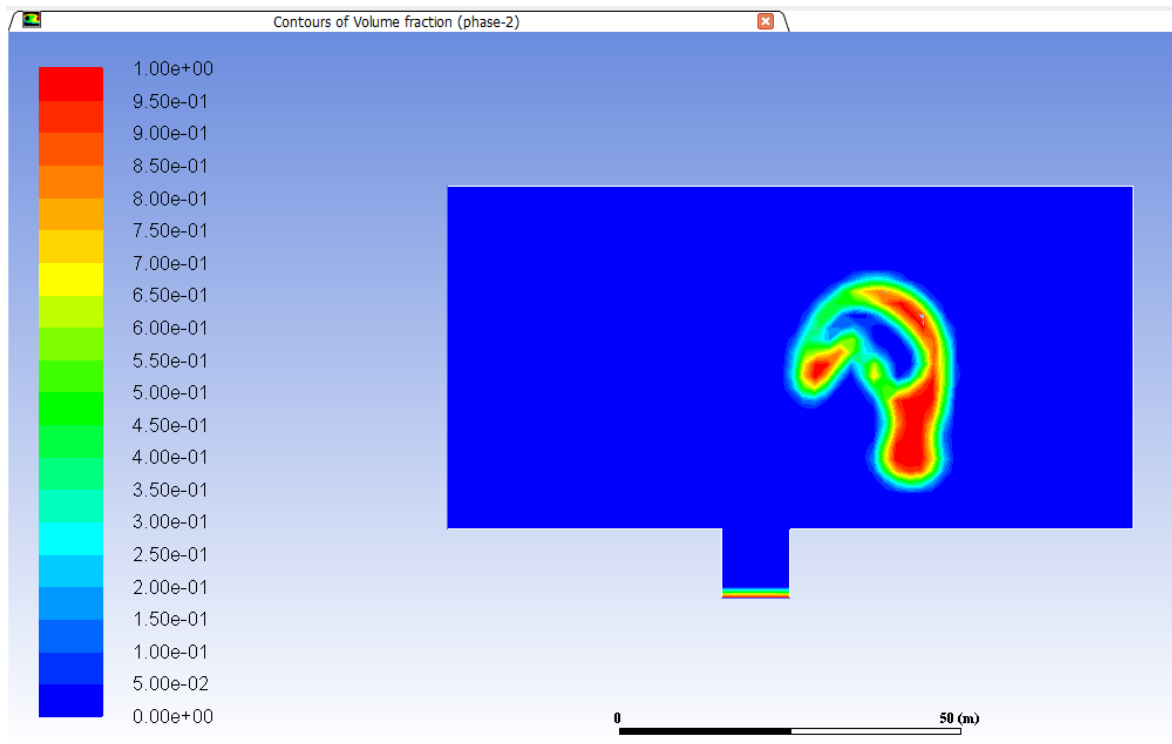


## Results:

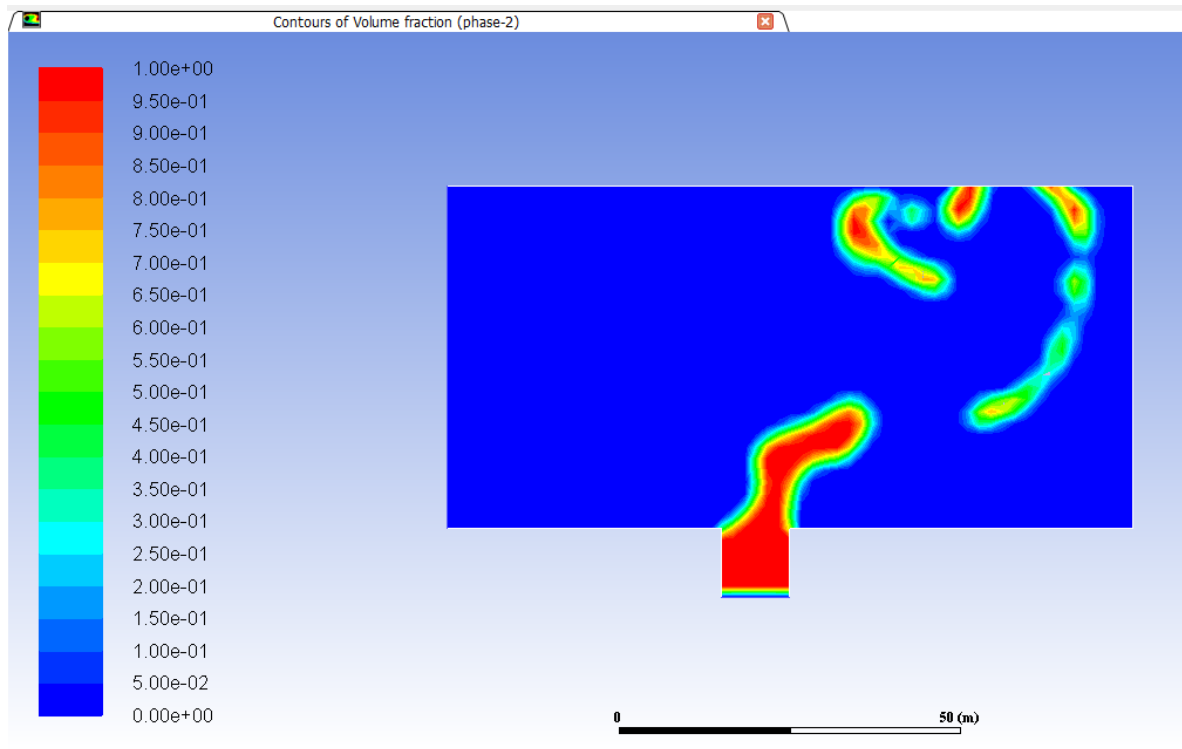
Contour plot of volume fraction of methane at t=5s:



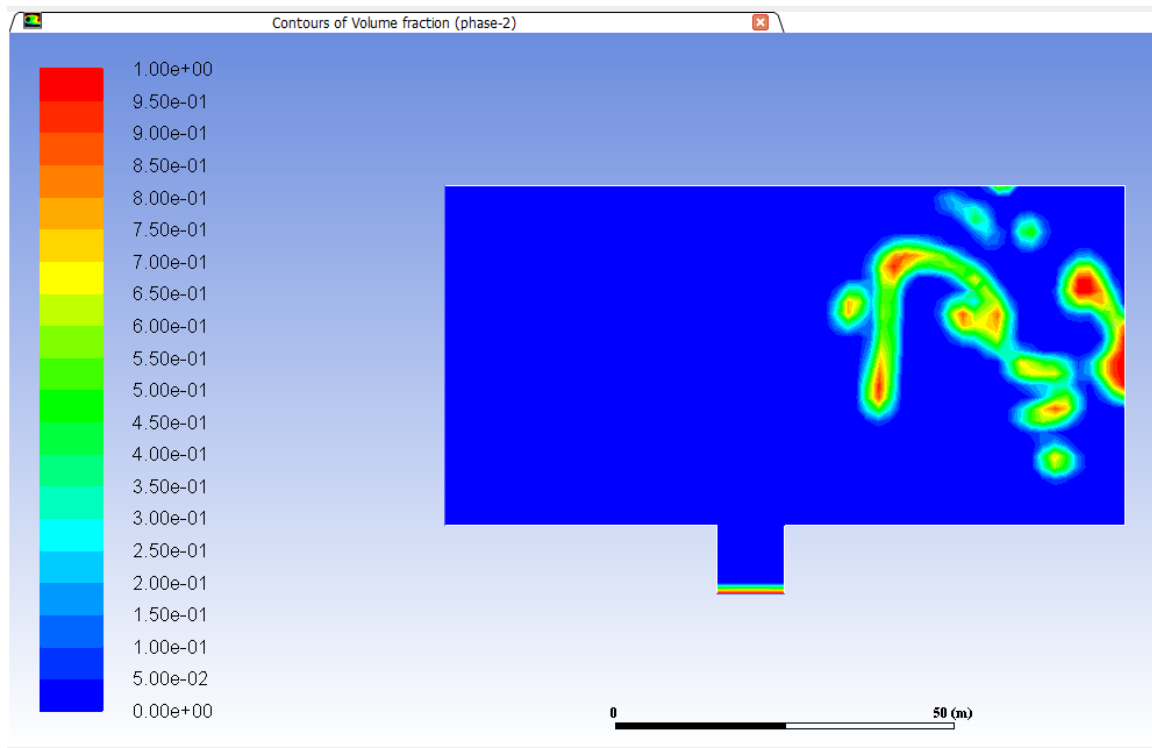
Contour plot of volume fraction of methane at t=10s:



Contour plot of volume fraction of methane at t= 15s:



Contour plot of volume fraction of methane at t=20s:



## Code:

```
#include "udf.h"

DEFINE_PROFILE(volume_fraction, thread, position)
{
    double x[ND_ND];          /* this will hold the position vector */
    double y;
    double z;
    /* assigning the flow time into t*/
    double t=CURRENT_TIME;
    /* dividing the time by 5 */
    double tc=t/5;
    /* flooring the division of time by 5 into the closest lower integer*/
    int tf=floor(tc);
    face_t f;
    begin_f_loop(f, thread)
    {
        F_CENTROID(x,f,thread);
        /* the if statement will trigger if the integer value of "tf" is even and lead to VF=1, otherwise it will lead
        to VF=0*/
        if ( tf % 2 == 0 ) {
            /* assigning the VF value */
            F_PROFILE(f, thread, position) = 1;
        }
        else {
            F_PROFILE(f, thread, position) = 0;
        }
    }
    end_f_loop(f, thread)
}
```