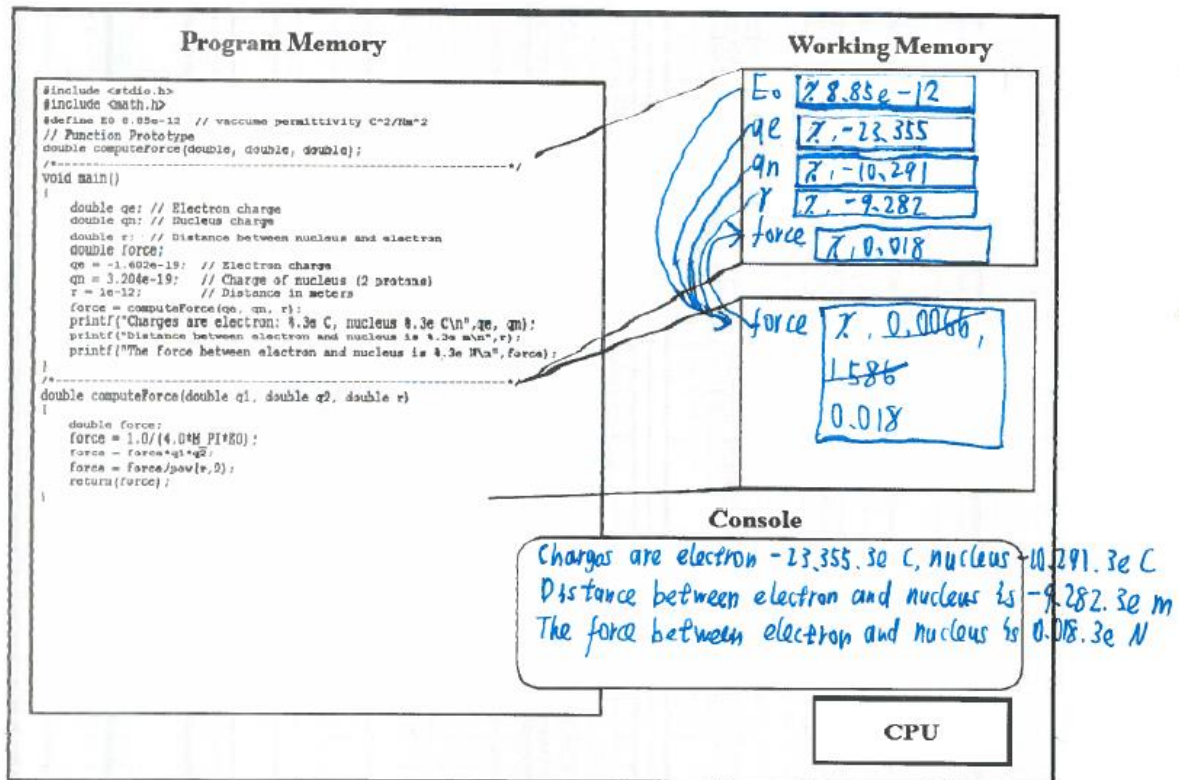
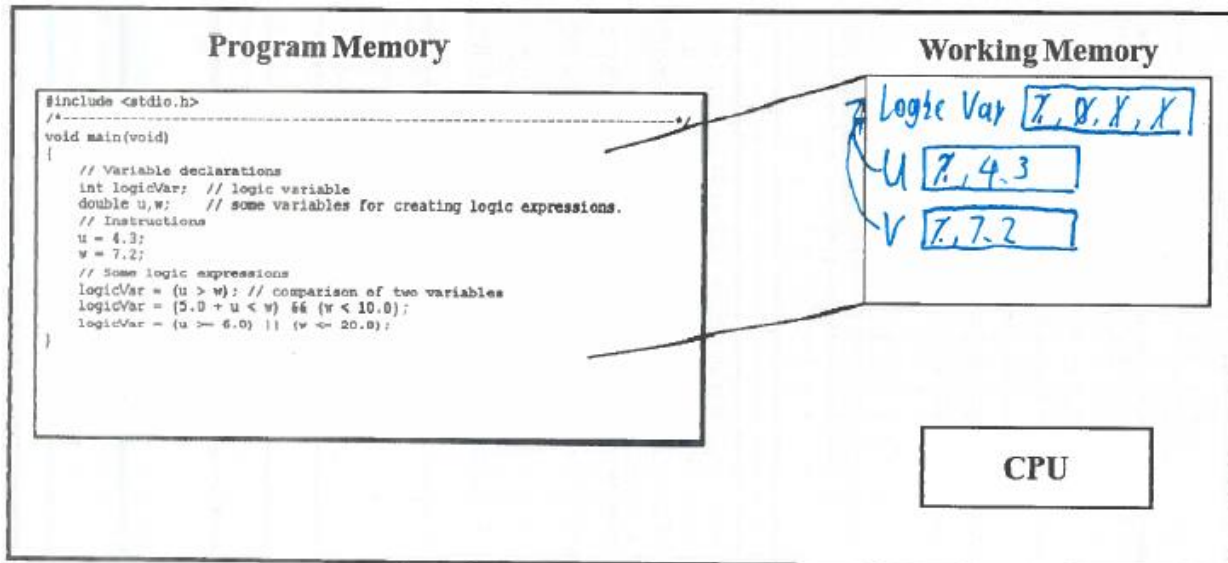


## Question 1



Note: You do NOT need to show how the CPU interacts with memory.

## Question 2

Source code:

```

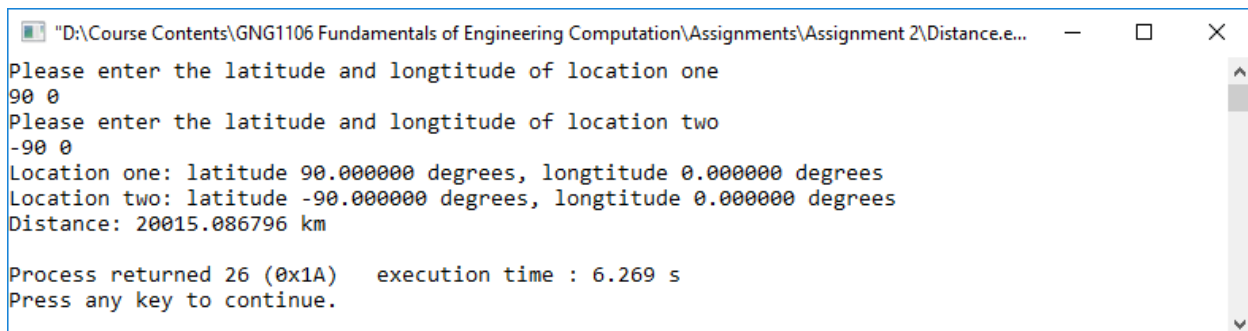
#include <stdio.h>
#include <math.h>
#define r 6371
double distance (double, double, double, double);

void main(void)
{
    double phi0, lmda0, phi1, lmda1, s;
    printf("Please enter the latitude and longitude of location one\n");
    scanf("%lf%lf", &phi0, &lmda0);
    printf("Please enter the latitude and longitude of location two\n");
    scanf("%lf%lf", &phi1, &lmda1);
    s = distance(phi0, lmda0, phi1, lmda1);
    printf("Location one: latitude %f degrees, longitude %f degrees\n", phi0, lmda0);
    printf("Location two: latitude %f degrees, longitude %f degrees\n", phi1, lmda1);
    printf("Distance: %f km\n", s);

double distance (double phi0, double lmda0, double phi1, double lmda1)
{
    double dist;
    phi0 = phi0*M_PI/180;
    phi1 = phi1*M_PI/180;
    lmda0 = lmda0*M_PI/180;
    lmda1 = lmda1*M_PI/180;
    dist = pow(sin((lmda0-lmda1)/2), 2);
    dist = (cos(phi1)*cos(phi0))*dist;
    dist = pow(sin((phi0-phi1)/2), 2)+dist;
    dist = 2*r*asin(sqrt(dist));
    return dist;
}

```

### Test results:



```

"D:\Course Contents\GNG1106 Fundamentals of Engineering Computation\Assignments\Assignment 2\Distance.e...
Please enter the latitude and longitude of location one
90 0
Please enter the latitude and longitude of location two
-90 0
Location one: latitude 90.000000 degrees, longitude 0.000000 degrees
Location two: latitude -90.000000 degrees, longitude 0.000000 degrees
Distance: 20015.086796 km

Process returned 26 (0x1A)   execution time : 6.269 s
Press any key to continue.

```

```
"D:\Course Contents\GNG1106 Fundamentals of Engineering Computation\Assignments\Assignment 2\Distance.e... - □ ×
Please enter the latitude and longitude of location one
90 45
Please enter the latitude and longitude of location two
-90 -45
Location one: latitude 90.000000 degrees, longitude 45.000000 degrees
Location two: latitude -90.000000 degrees, longitude -45.000000 degrees
Distance: 20015.086796 km

Process returned 26 (0x1A) execution time : 8.227 s
Press any key to continue.
```

```
"D:\Course Contents\GNG1106 Fundamentals of Engineering Computation\Assignments\Assignment 2\Distance.e... - □ ×
Please enter the latitude and longitude of location one
0 0
Please enter the latitude and longitude of location two
0 180
Location one: latitude 0.000000 degrees, longitude 0.000000 degrees
Location two: latitude 0.000000 degrees, longitude 180.000000 degrees
Distance: 20015.086796 km

Process returned 26 (0x1A) execution time : 6.625 s
Press any key to continue.
```

```
"D:\Course Contents\GNG1106 Fundamentals of Engineering Computation\Assignments\Assignment 2\Distance.e... - □ ×
Please enter the latitude and longitude of location one
52.52 13.4
Please enter the latitude and longitude of location two
-34.6 -58.38
Location one: latitude 52.520000 degrees, longitude 13.400000 degrees
Location two: latitude -34.600000 degrees, longitude -58.380000 degrees
Distance: 11908.824147 km

Process returned 26 (0x1A) execution time : 43.921 s
Press any key to continue.
```

```
"D:\Course Contents\GNG1106 Fundamentals of Engineering Computation\Assignments\Assignment 2\Distance.e... - □ ×
Please enter the latitude and longitude of location one
49.28 -123.12
Please enter the latitude and longitude of location two
-33.87 151.21
Location one: latitude 49.280000 degrees, longitude -123.120000 degrees
Location two: latitude -33.870000 degrees, longitude 151.210000 degrees
Distance: 12501.225958 km

Process returned 26 (0x1A) execution time : 45.581 s
Press any key to continue.
```

```
"D:\Course Contents\GNG1106 Fundamentals of Engineering Computation\Assignments\Assignment 2\Distance.e...  -  □  ×
Please enter the latitude and longitude of location one
42.4 -71.08
Please enter the latitude and longitude of location two
10.5 -84.5
Location one: latitude 42.400000 degrees, longitude -71.080000 degrees
Location two: latitude 10.500000 degrees, longitude -84.500000 degrees
Distance: 3779.394850 km

Process returned 25 (0x19)  execution time : 39.246 s
Press any key to continue.
```