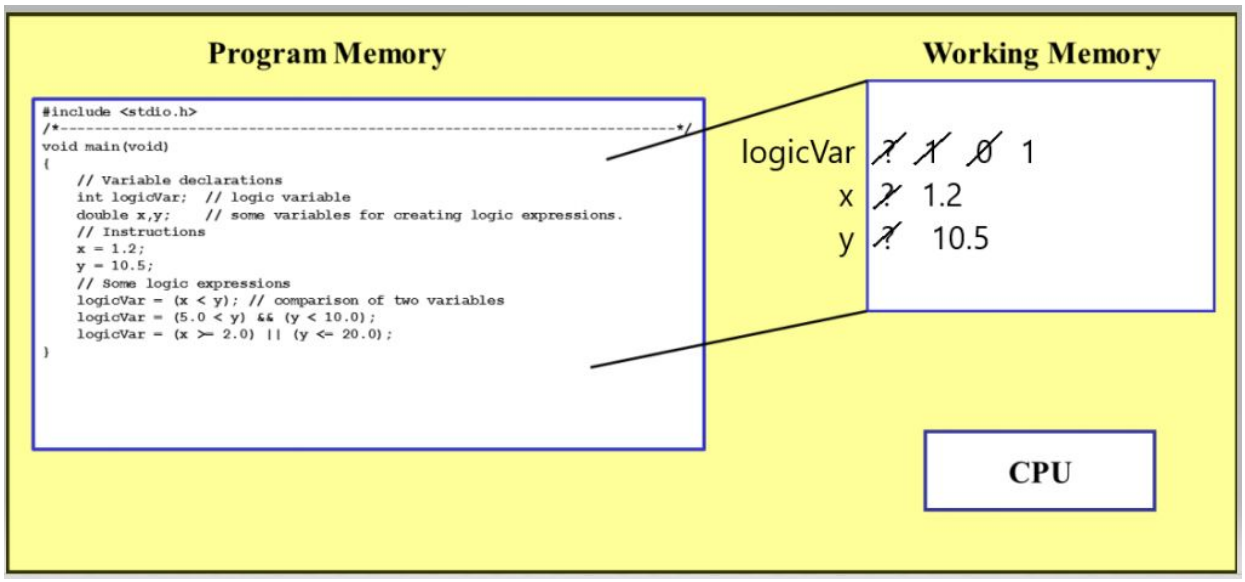
Summar Chowdhary- 300080745 Due: September 27, 2019

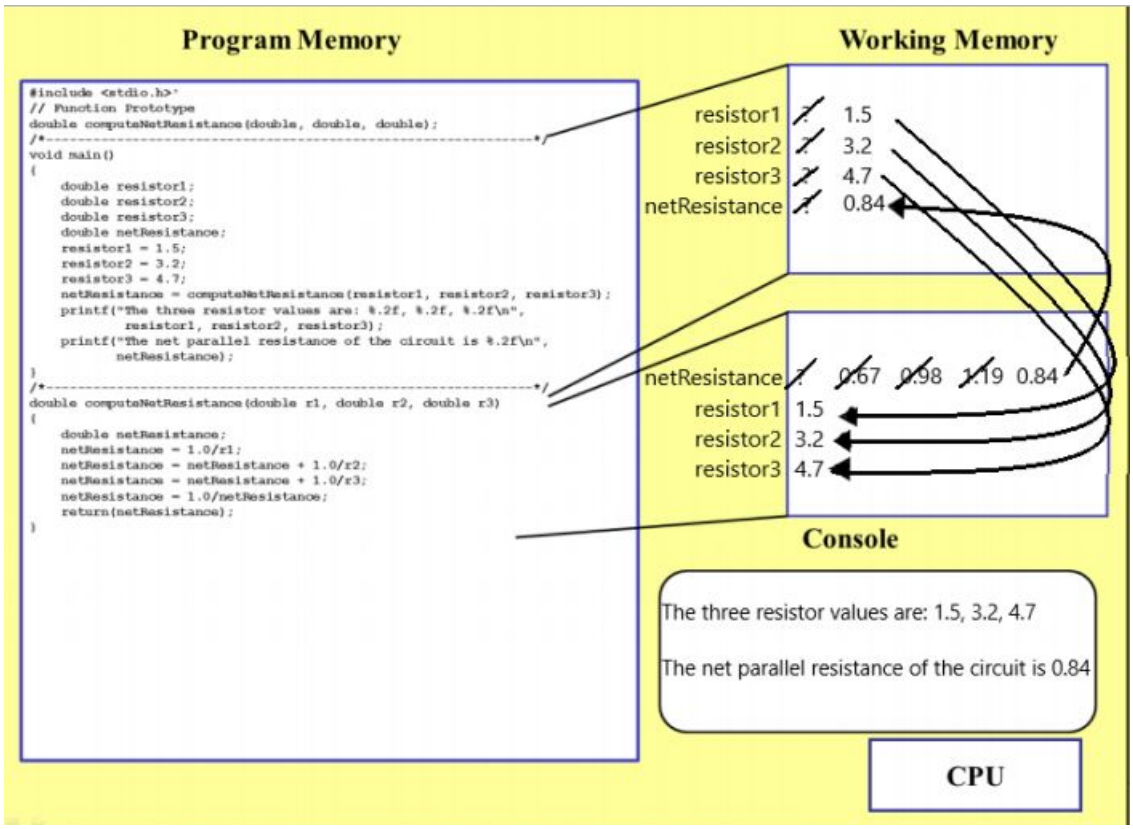
GNG1106 - Assignment 2

Question 1 (15 marks)

a)



b)



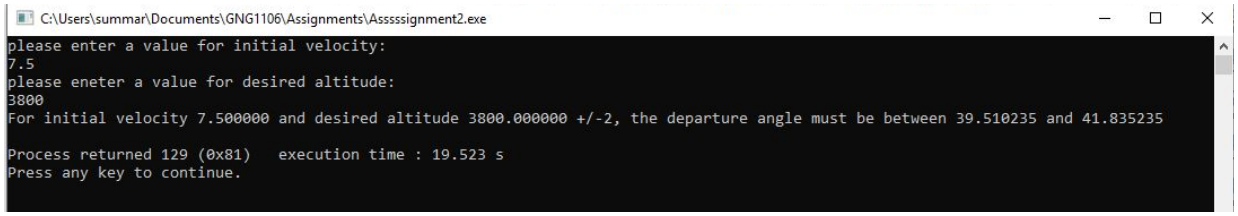
Question 2 (15 marks)

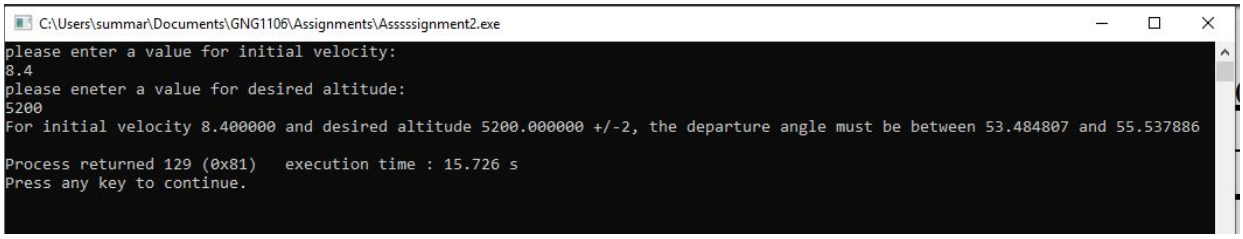
Start here | Asssssignment2.c

```c
#include<stdio.h>
#include<math.h>
#define Ve 11.2
#define R 6371

double angleMin(double, double );
double angleMax(double, double );

void main()
{
    double v0;
    double aR;
    double minAngle;
    double maxAngle;
    printf("please enter a value for initial velocity: \n");
    scanf("%lf", &v0);
    printf("please eneter a value for desired altitude: \n");
    scanf("%lf", &aR);
    minAngle=angleMin(v0,aR);
    maxAngle=angleMax(v0,aR);
    printf("For initial velocity %lf and desired altitude %lf +/-2%, the departure angle must be between %lf and %lf\n",v0 ,aR ,minAngle ,maxAngle);
}

double angleMin(double v0, double aR)
{
    double minAngle;
    double maxAlt;
    maxAlt=((aR*1.02)/R);
    minAngle=pow((Ve/v0),2);
    minAngle=(maxAlt/(1+maxAlt))*minAngle;
    minAngle=sqrt(1-minAngle);
    minAngle=asin((1+maxAlt)*minAngle);
    minAngle=minAngle*(180/M_PI);
    return(minAngle);
}
double angleMax(double v0, double aR)
{
    double maxAngle;
    double minAlt;
    minAlt=((aR/1.02)/R);
    maxAngle=pow((Ve/v0),2);
    maxAngle=(minAlt/(1+minAlt))*maxAngle;
    maxAngle=sqrt(1-maxAngle);
    maxAngle=asin((1+minAlt)*maxAngle);
    maxAngle=maxAngle*(180/M_PI);
    return(maxAngle);
}
```

```
C:\Users\summar\Documents\GNG1106\Assignments\Asssssignment2.exe
please enter a value for initial velocity:
5.5
please eneter a value for desired altitude:
1000
For initial velocity 5.500000 and desired altitude 1000.000000 +/-2, the departure angle must be between 49.350635 and 50.483990

Process returned 129 (0x81)   execution time : 38.429 s
Press any key to continue.
```

```
C:\Users\summar\Documents\GNG1106\Assignments\Asssssignment2.exe
please enter a value for initial velocity:
6.5
please eneter a value for desired altitude:
2100
For initial velocity 6.500000 and desired altitude 2100.000000 +/-2, the departure angle must be between 42.224999 and 43.925066

Process returned 129 (0x81)   execution time : 41.217 s
Press any key to continue.
```


C:\Users\summar\Documents\GNG1106\Assignments\Asssssignment2.exe
please enter a value for initial velocity:
7.5
please eneter a value for desired altitude:
3800
For initial velocity 7.500000 and desired altitude 3800.000000 +/-2, the departure angle must be between 39.510235 and 41.835235
Process returned 129 (0x81)   execution time : 19.523 s
Press any key to continue.


C:\Users\summar\Documents\GNG1106\Assignments\Asssssignment2.exe
please enter a value for initial velocity:
8.4
please eneter a value for desired altitude:
5200
For initial velocity 8.400000 and desired altitude 5200.000000 +/-2, the departure angle must be between 53.484807 and 55.537886
Process returned 129 (0x81)   execution time : 15.726 s
Press any key to continue.