Code for task 1:

```cpp
1   #include <sys/time.h>
2   #include <signal.h>
3   #include <stdio.h>
4   #include <string.h>
5   #include <time.h>
6   #include <stdlib.h>
7   #include <iostream>
8   using namespace std;
9   const int N = 1024;
10  int main()
11  {
12
13      static float A[N][N] = {0};
14      static float B[N][N] = {0};
15      static float C[N][N] = {0};
16
17
18      // Assign random values
19      srand((unsigned)time(NULL));
20      for (int i=0; i<N; i++) {
21          for (int j=0; j<N; j++) {
22              A[i][j] = rand()/(float)RAND_MAX;
23              B[i][j] = rand()/(float)RAND_MAX;
24          }
25      }
26
27      // calculate time consumed
28      double startTime = clock();
29
30      for (int i=0; i<N; i++) {
31          for (int k=0; k<N; k++) {
32              float sum = 0;
33              for (int j=0; j<N; j++) {
34                  sum += A[i][k]*B[k][j];
35              }
36              C[i][k] = sum;
37          }
38      }
39      double stopTime = clock();
40      cout << "Time consumed: " << (stopTime-startTime)/CLOCKS_PER_SEC << " secs" << endl;
41      return 0;
42  }
43
```

N = 256:

```
pi@raspberrypi:~/Documents $ cd Lab3
pi@raspberrypi:~/Documents/Lab3 $ ls
commands.txt    matrixmult     matrixmult.cpp
Lab3_part2.py   matrixmult.c   matrixmult.o
pi@raspberrypi:~/Documents/Lab3 $ cd matrixmult
bash: cd: matrixmult: Not a directory
pi@raspberrypi:~/Documents/Lab3 $ cd matrixmult.c
bash: cd: matrixmult.c: Not a directory
pi@raspberrypi:~/Documents/Lab3 $ cd matrixmult.cpp
bash: cd: matrixmult.cpp: Not a directory
pi@raspberrypi:~/Documents/Lab3 $ g++ matrixmult.cpp -o matrixmult
pi@raspberrypi:~/Documents/Lab3 $ sudo ./matrixmult
Time consumed: 0.173849 secs
pi@raspberrypi:~/Documents/Lab3 $ perf stat -e L1-dcache-loads,L1-dcache-loads-misses ./matrixmult
Time consumed: 0.150455 secs

 Performance counter stats for './matrixmult':

       189,728,126      L1-dcache-loads:u
            88,293      L1-dcache-loads-misses:u  #     0.05% of all L1-dcache hits

     0.167279574 seconds time elapsed

pi@raspberrypi:~/Documents/Lab3 $
```

N = 512:

```
pi@raspberrypi:~/Documents/Lab3 $ g++ matrixmult.cpp -o matrixmult
pi@raspberrypi:~/Documents/Lab3 $ sudo ./matrixmult
Time consumed: 1.19674 secs
pi@raspberrypi:~/Documents/Lab3 $ perf stat -e L1-dcache-loads,L1-dcache-loads-misses ./matrixmult
Time consumed: 1.20172 secs

 Performance counter stats for './matrixmult':

     1,495,352,415      L1-dcache-loads:u
           504,419      L1-dcache-loads-misses:u  #    0.03% of all L1-dcache hits

       1.255161999 seconds time elapsed

pi@raspberrypi:~/Documents/Lab3 $
```

N = 1024:

```
pi@raspberrypi:~/Documents/Lab3 $ g++ matrixmult.cpp -o matrixmult
pi@raspberrypi:~/Documents/Lab3 $ sudo ./matrixmult
Time consumed: 9.49682 secs
pi@raspberrypi:~/Documents/Lab3 $ perf stat -e L1-dcache-loads,L1-dcache-loads-misses ./matrixmult
Time consumed: 9.51446 secs

 Performance counter stats for './matrixmult':

    11,885,133,538      L1-dcache-loads:u
         3,504,835      L1-dcache-loads-misses:u  #    0.03% of all L1-dcache hits

       9.707394049 seconds time elapsed

pi@raspberrypi:~/Documents/Lab3 $
```