Walchand College of Engineering, Sangli Department of Computer Science and Engineering

Class: Final Year (Computer Science and Engineering)

Year: 2021-22 Semester: 1

Course: High Performance Computing Lab

Practical No. 1

Exam Seat No : 2019BTECS00205

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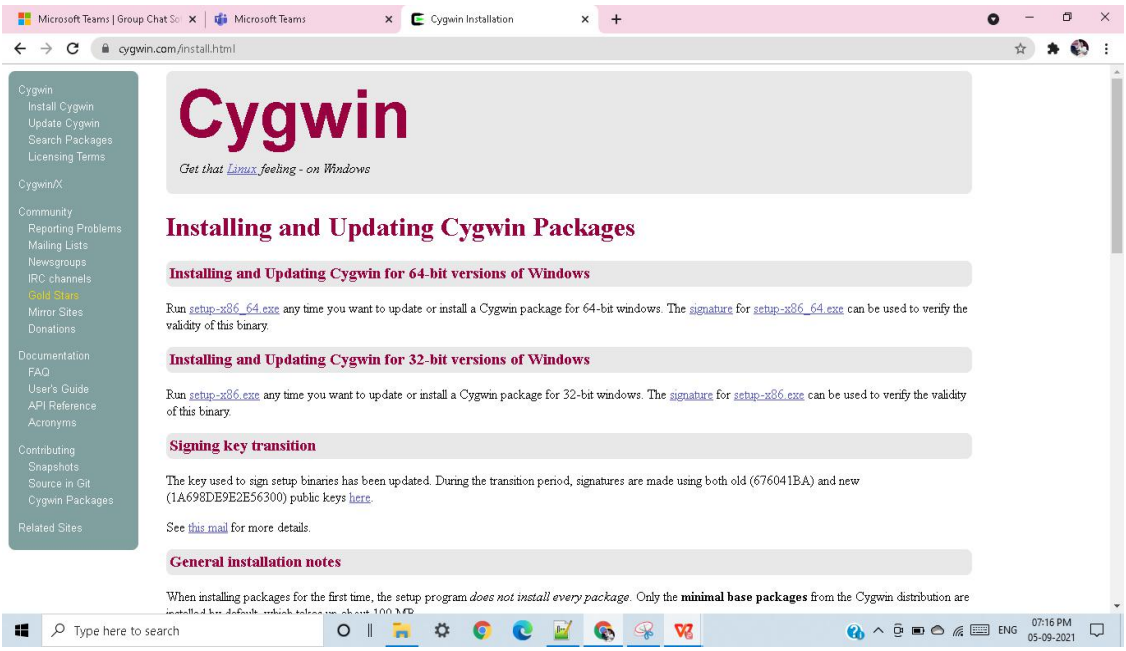
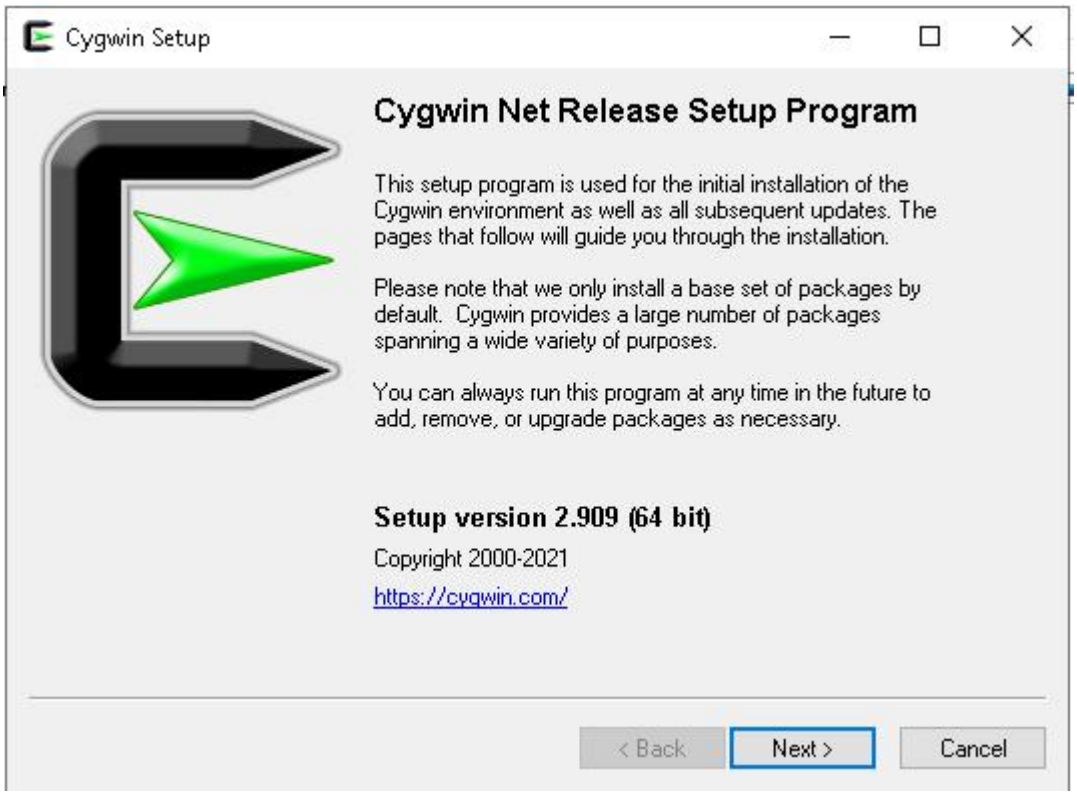
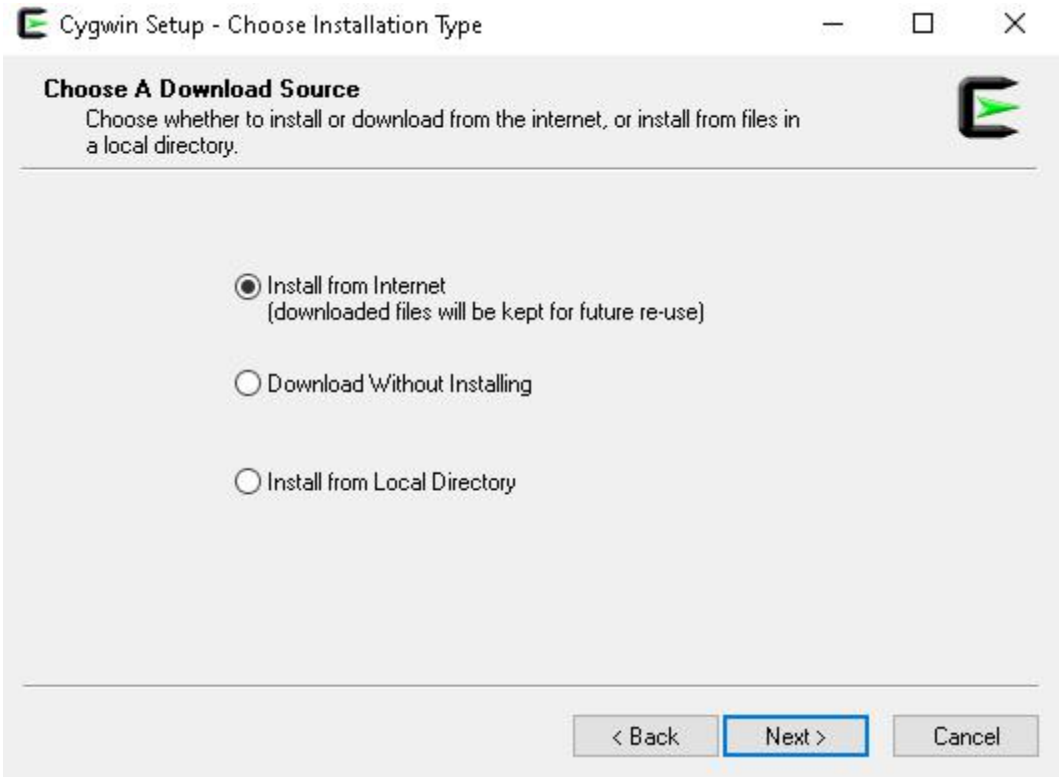
Problem Statement 1: How to create parallel program to print Hello from multiple threads.

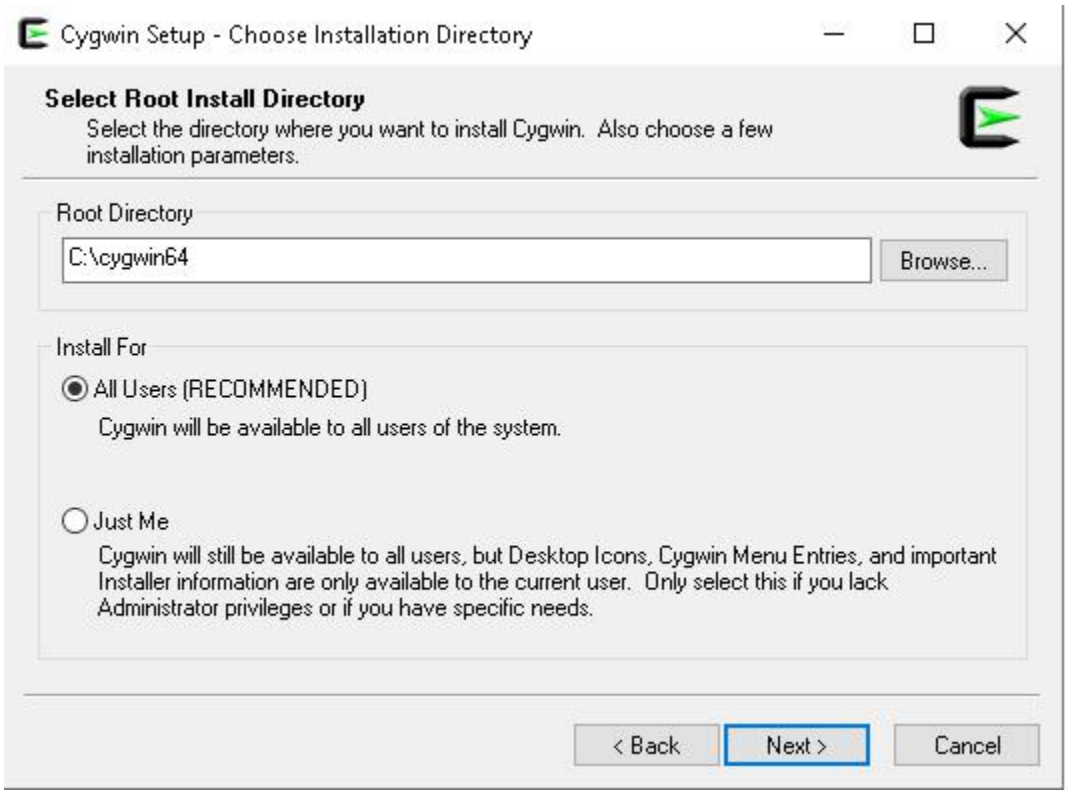
Screenshot 1:

Installation of Cygwin:




Cygwin Setup
Cygwin Net Release Setup Program
This setup program is used for the initial installation of the Cygwin environment as well as all subsequent updates. The pages that follow will guide you through the installation.
Please note that we only install a base set of packages by default. Cygwin provides a large number of packages spanning a wide variety of purposes.
You can always run this program at any time in the future to add, remove, or upgrade packages as necessary.
Setup version 2.909 (64 bit)
Copyright 2000-2021
https://cygwin.com/
< Back
Next >
Cancel


Cygwin Setup - Choose Installation Type
Choose A Download Source
Choose whether to install or download from the internet, or install from files in a local directory.
Install from Internet
(downloaded files will be kept for future re-use)
Download Without Installing
Install from Local Directory
< Back
Next >
Cancel



Information :

```
#include   <omp.h>
#include  <stdio.h>
#include <stdlib.h>
int main()
{
   omp_set_num_threads(10);

  #pragma omp parallel
   {
printf("Hello from 2019BTECS00205 with id= %d\n",omp_get_thread_num());
   }
   }
```

```
~
CG-DTE@CG-DTE-Student ~
$ g++ numthreads.c -fopenmp -o num_threads

CG-DTE@CG-DTE-Student ~
$ ./num_threads.exe
Hello from 2019BTECS00205 with thread id= 0
Hello from 2019BTECS00205 with thread id= 2
Hello from 2019BTECS00205 with thread id= 3
Hello from 2019BTECS00205 with thread id= 4
Hello from 2019BTECS00205 with thread id= 5
Hello from 2019BTECS00205 with thread id= 6
Hello from 2019BTECS00205 with thread id= 7
Hello from 2019BTECS00205 with thread id= 1
```

Explanation:

1. We first have to include openmp header file i.e. #include<omp.h> .
2. Then, we have to specify parallel region by #pragma omp parallel directive.
3. The pragma omp parallel is used to fork additional threads to carry out the work enclosed in the parallel.The original thread having thread id 0 and it is the master thread .
4. We can set number of threads by using external variable or by using omp_set_num_threads () function.
5. To compile the code we need to run the following command:
6. gcc -o numthreads.c -fopenmp -o num_threads
7. The output is then saved as num_threads.exe
8. Then to run we have to use the command : ./num_threads.exe
9. Once the parallel region ended, all threads will get merged into the master thread.

Github Link: https://github.com/shwetaarbune/HPC-LAB