



Carleton
UNIVERSITY

SYSC5709F [35794]

Advance Topics in Software Engineering

HCM-ERP – User Guide

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Human Capital Management System ERP

Employees are valuable asset in organisation. Therefore, managing the employees is most crucial task. This system will keep of records of employee, salaries and designation. The software consists of menu which will display all available options like employee management which will include adding, modifying, deleting and displaying the employee data.

Additionally, the system will keep a track of employees' leaves and wouldn't allow employee to apply for leave more than entitled. Lastly, the system will calculate the employee's salary based on no of hours he/she worked. Also, system will display the pay stub if he/she wants.

Installing Cygwin, GCC

Windows - Installation

1. Create the folder C:\cygwin64
2. Visit <http://www.cygwin.com/>.

Look for the section "Installing Cygwin" and select the appropriate version (32 bit or 64 bit) for your PC. In this example, we will show how to install the 64-bit version.

Download the setup file chosen in **C:\cygwin64**. Based on the OS version we will get a file named setup-x86_64.exe (64-bit installation) or setup-x86.exe (32-bit installation)

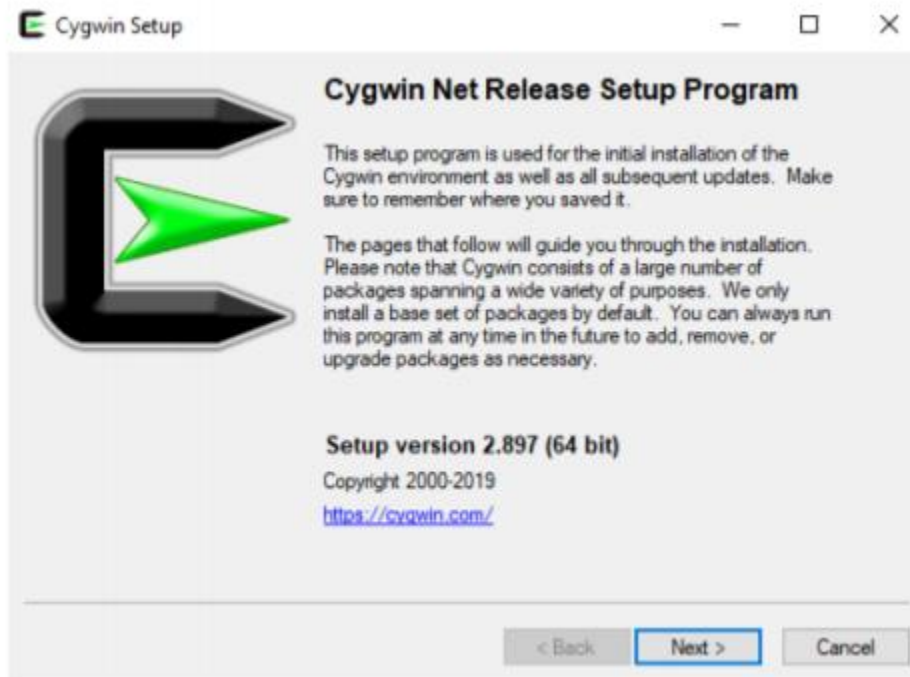
Installing Cygwin

Install Cygwin by running [setup-x86_64.exe](#) (64-bit installation) or [setup-x86.exe](#) (32-bit installation)

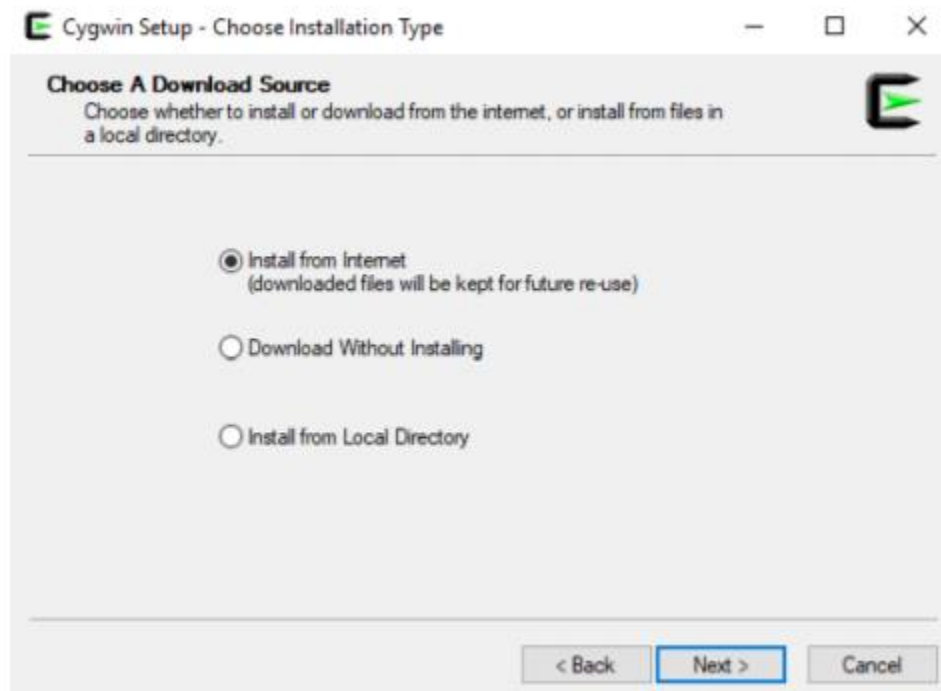
Use the setup program to perform a [fresh install](#) or to [update](#) an existing installation.

Keep in mind that individual packages in the distribution are updated separately from the DLL so the Cygwin DLL version is not useful as a general Cygwin distribution release number.

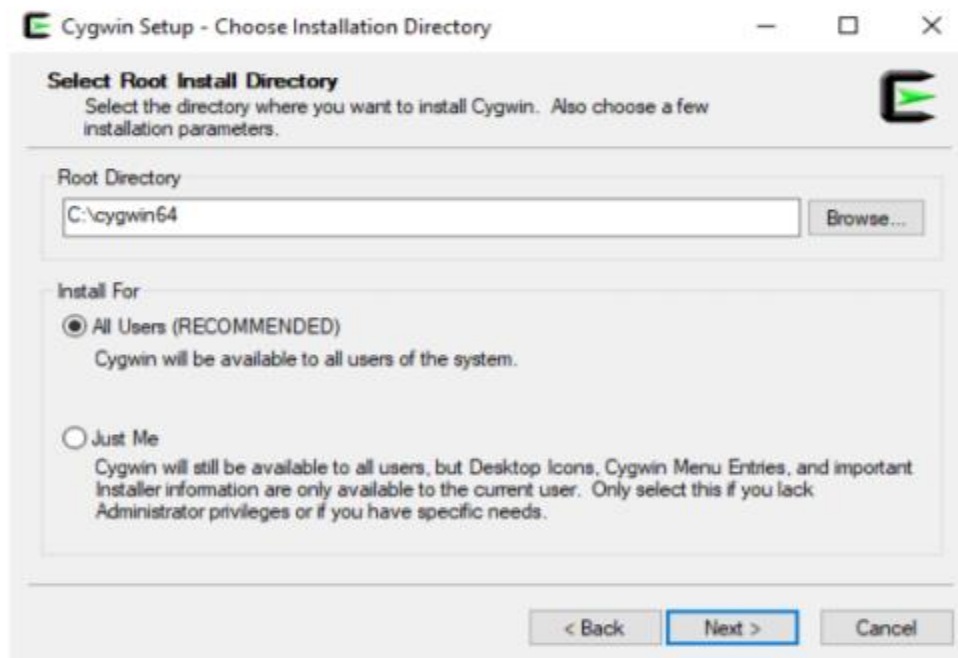
3. Execute setup-x86_64.exe (64-bit installation) or setup-x86.exe (32-bit installation) and click on “Next >”. We will see the following welcome screen.



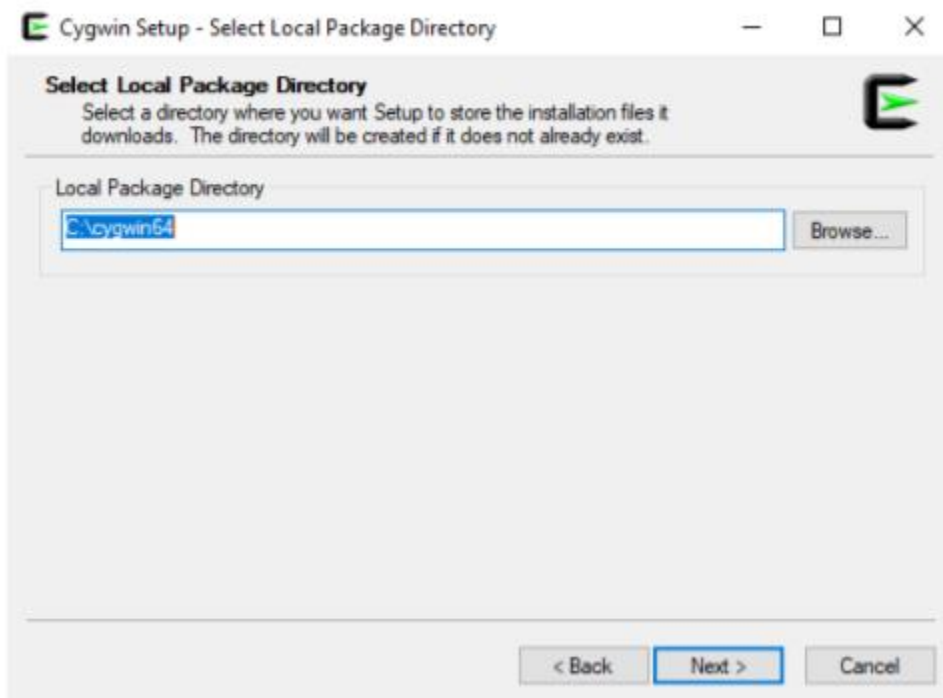
4. Select the option "Install from Internet" and click on “Next >”



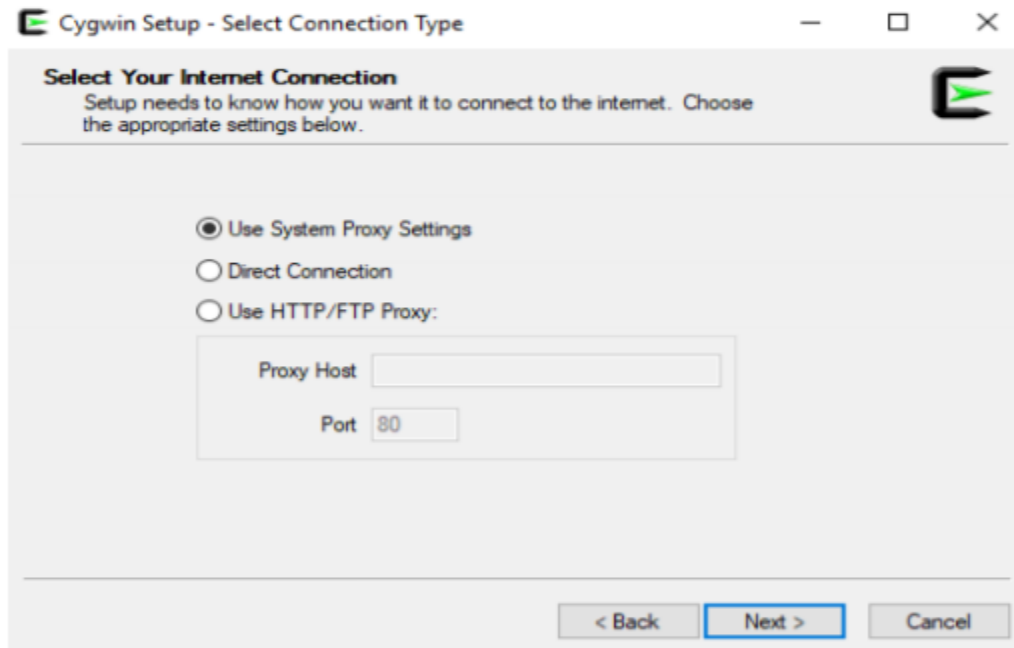
5. We need to select the Root Install directory for storage of Cygwin files. Choose the default (c:\cygwin64, as seen in the screenshot, and “All Users (RECOMMENDED)”. Click on “Next >”



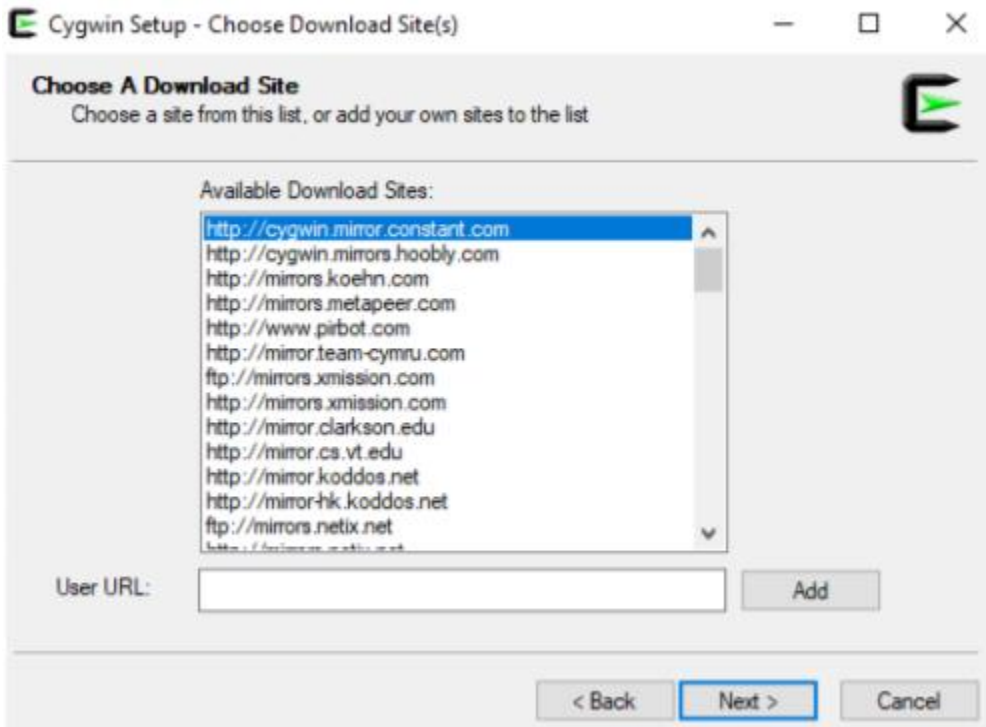
6. Choose your preferred directory for storage of Cygwin local package directory as in the screenshot (i.e. the folder we just created) and click on “Next >”



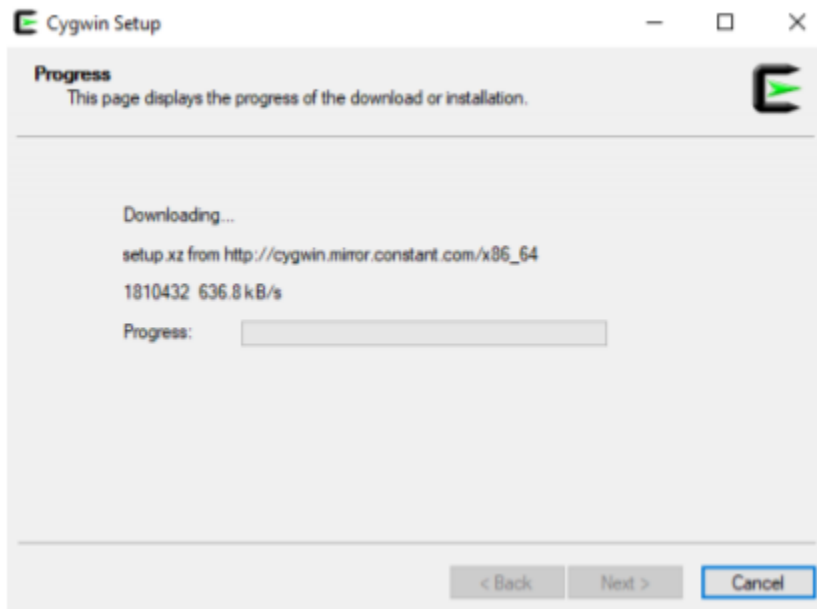
7. Select the option “Use System Proxy Setting” and click on “Next >”.



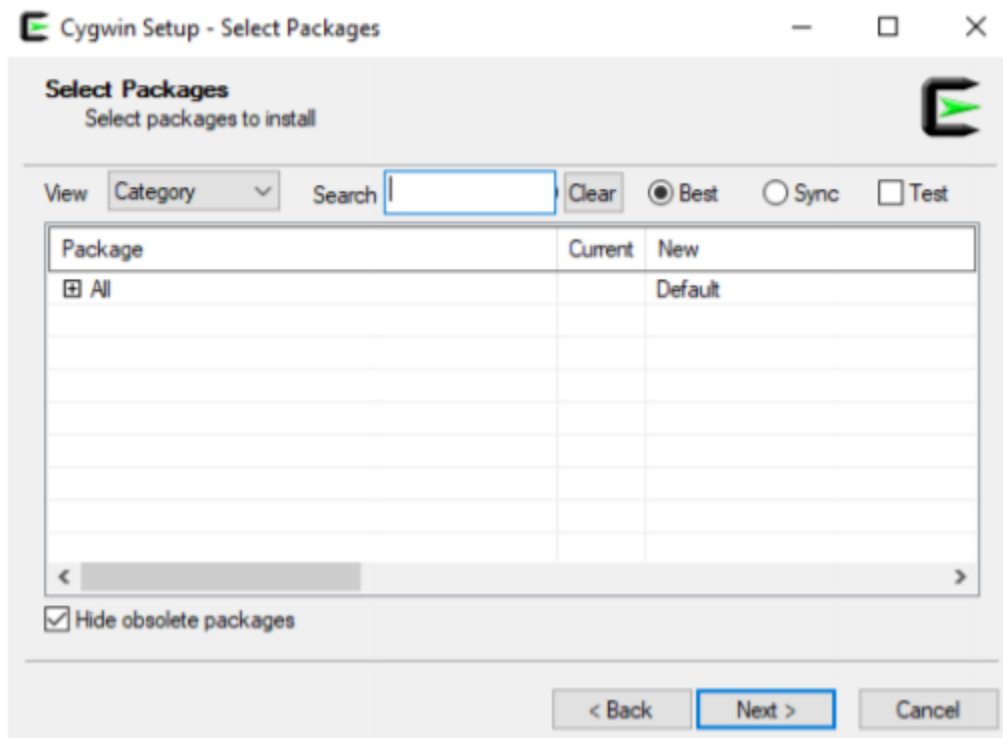
8. After a few seconds, the following window will appear. Choose a Download Site as in the screenshot. Click on “Next >” (in this case, <http://cygwin.mirror.constant.com>)



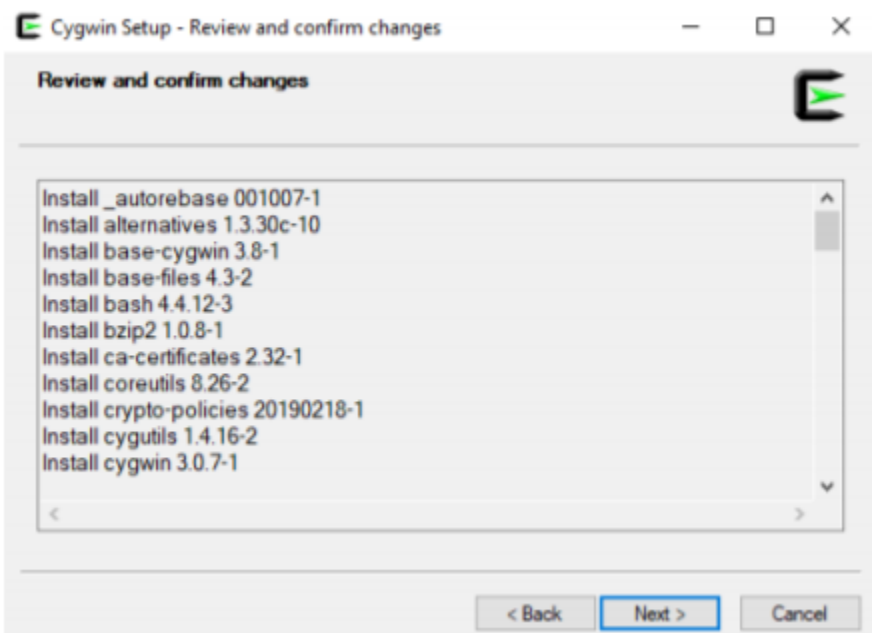
THE UNIVERSITY OF CHICAGO



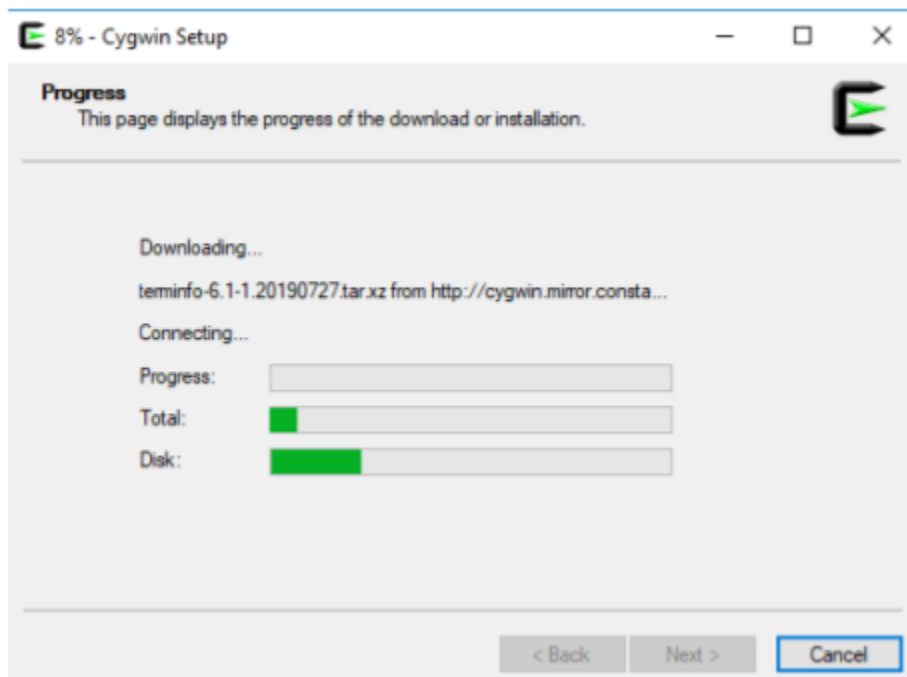
This will install the default tools and libraries.



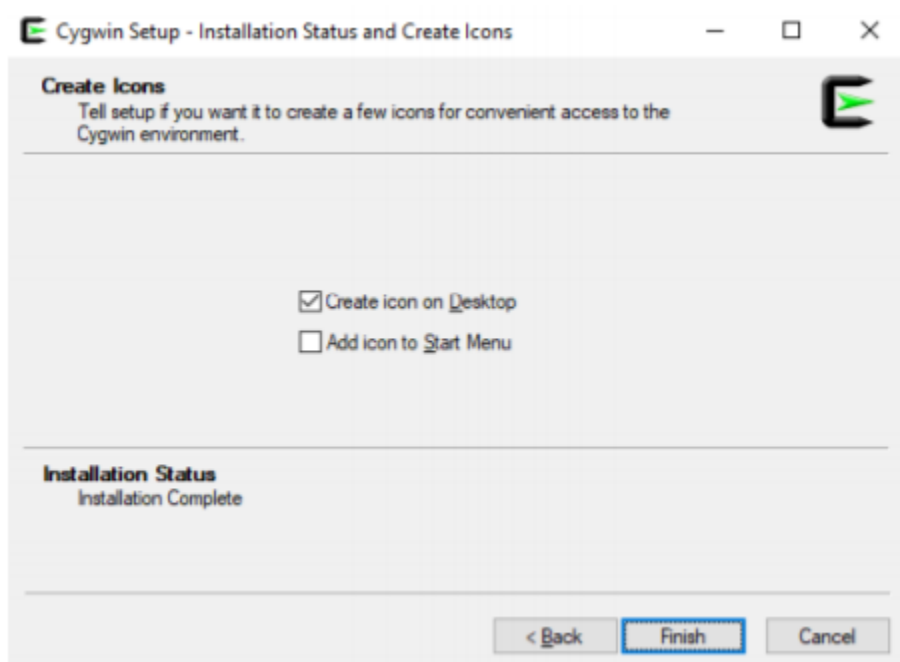
11. The following window will appear. Click on “Next >”



12. The progress window below will appear.



13. Once the installation finishes, select the option “Create icon on Desktop” to easily access the Cygwin terminal. Click on “Finish”



14. Once the installation finishes, if we open the cygwin64 folder, it should have the following content.

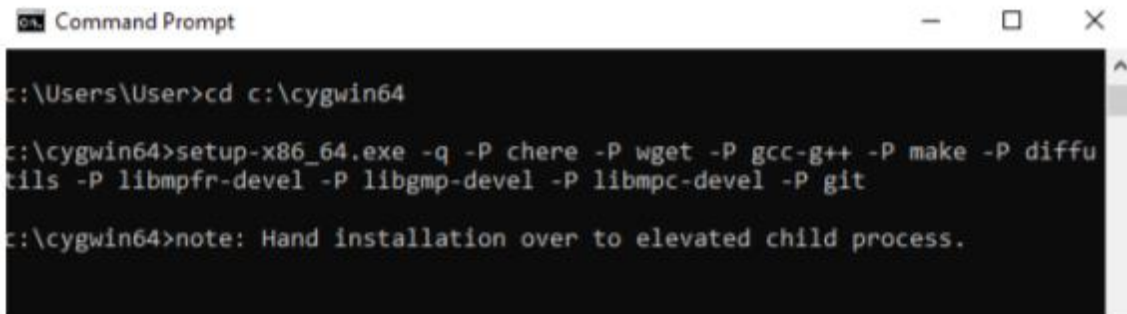
This PC > Local Disk (C:) > cygwin64				
Name	Date modified	Type	Size	
bin	8/8/2019 10:57 AM	File folder		
dev	8/8/2019 10:57 AM	File folder		
etc	8/8/2019 10:58 AM	File folder		
home	8/8/2019 10:56 AM	File folder		
lib	8/8/2019 10:57 AM	File folder		
sbin	8/8/2019 10:57 AM	File folder		
tmp	8/8/2019 10:57 AM	File folder		
usr	8/8/2019 10:57 AM	File folder		
var	8/8/2019 10:56 AM	File folder		
Cygwin.bat	8/8/2019 10:57 AM	Windows Batch File	1 KB	
Cygwin.ico	8/8/2019 11:02 AM	Icon	154 KB	
Cygwin-Terminal.ico	8/8/2019 11:02 AM	Icon	53 KB	
setup-x86_64.exe	8/8/2019 10:29 AM	Application	1,197 KB	

15. Open the windows terminal (Command Prompt; type “cmd” on your Windows search). Type
cd c:\cygwin64

For the 64-bit installation, type:

setup-x86_64.exe -q -P chere -P wget -P gcc-g++ -P make -P diffutils -P libmpfr-devel -P libgmp-devel -P libmpc-devel -P git (For 32-bit installation, replace by setup-x86.exe)

It will install all the necessary libraries and the last version of gcc/g++ compiler.



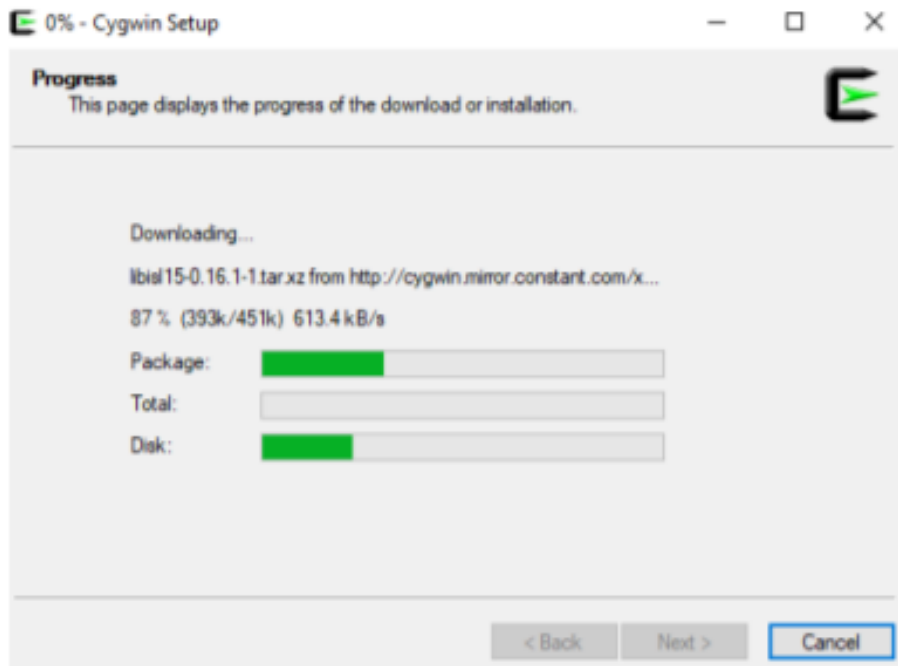
```
Command Prompt

c:\Users\User>cd c:\cygwin64

c:\cygwin64>setup-x86_64.exe -q -P chere -P wget -P gcc-g++ -P make -P diffu
utils -P libmpfr-devel -P libgmp-devel -P libmpc-devel -P git

c:\cygwin64>note: Hand installation over to elevated child process.
```

16. A Progress window will pop up while all the required packages along with their dependencies are downloaded and installed, as in the following screen capture.



The installation process will take several minutes. Once the installation process finishes, the window will disappear automatically, and we can close the Command Prompt.

17. Run Cygwin on your desktop, in administrator mode (right-click on the desktop icon and select the option “Run as administrator”; we can also use `c:\cygwin64`, and run the script “`cygwin.bat`” in Administrator mode).

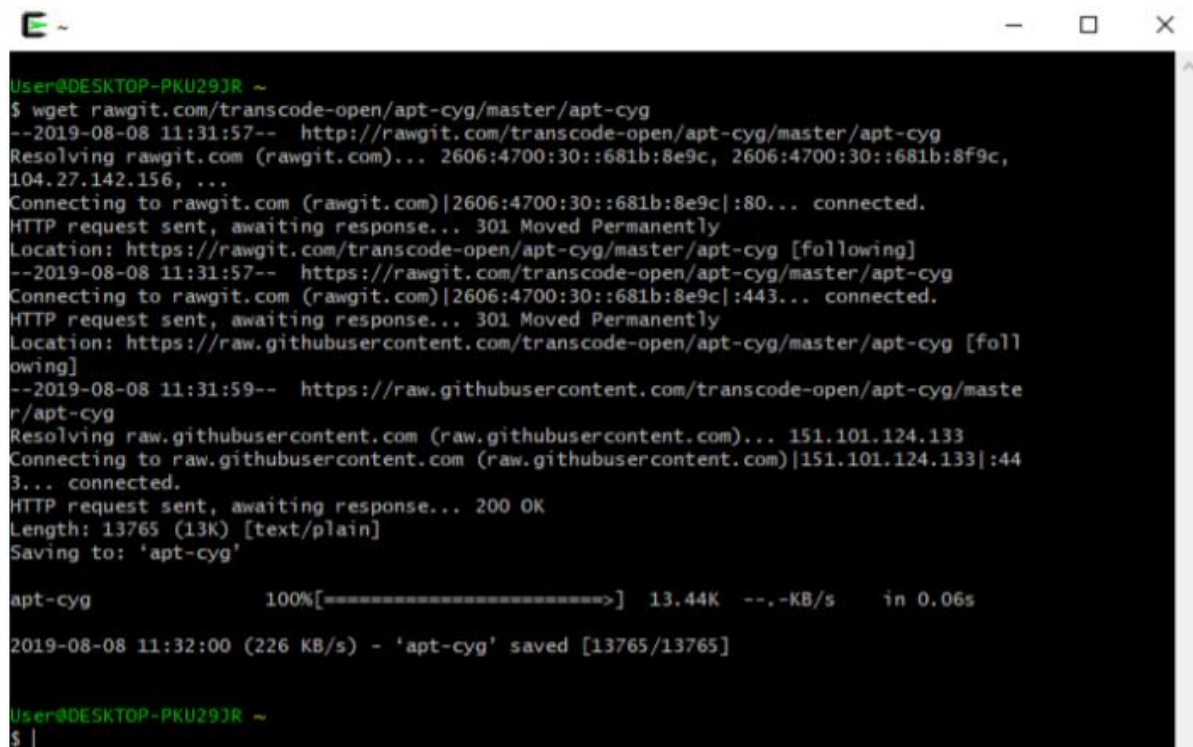
The skeleton files will be created.

```
Copying skeleton files.
These files are for the users to personalise their cygwin experience.
They will never be overwritten nor automatically updated.
'./bashrc' -> '/YOURDIRECTORY//.bashrc'
'./bash_profile' -> '/YOURDIRECTORY//.bash_profile'
'./inputrc' -> '/YOURDIRECTORY//.inputrc'
'./profile' -> '/YOURDIRECTORY//.profile'

YOURDIRECTORY~
$
```

18. Type the following command on the terminal and press “Enter” (in this case, we show an example for user “User” running Cygwin on the Desktop):

`wget rawgit.com/transcode-open/apt-cyg/master/apt-cyg`



```
User@DESKTOP-PKU29JR ~
$ wget rawgit.com/transcode-open/apt-cyg/master/apt-cyg
--2019-08-08 11:31:57-- http://rawgit.com/transcode-open/apt-cyg/master/apt-cyg
Resolving rawgit.com (rawgit.com)... 2606:4700:30::681b:8e9c, 2606:4700:30::681b:8f9c,
104.27.142.156, ...
Connecting to rawgit.com (rawgit.com)|2606:4700:30::681b:8e9c|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://rawgit.com/transcode-open/apt-cyg/master/apt-cyg [following]
--2019-08-08 11:31:57-- https://rawgit.com/transcode-open/apt-cyg/master/apt-cyg
Connecting to rawgit.com (rawgit.com)|2606:4700:30::681b:8e9c|:443... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://raw.githubusercontent.com/transcode-open/apt-cyg/master/apt-cyg [following]
--2019-08-08 11:31:59-- https://raw.githubusercontent.com/transcode-open/apt-cyg/master/apt-cyg
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 151.101.124.133
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|151.101.124.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 13765 (13K) [text/plain]
Saving to: 'apt-cyg'

apt-cyg                100%[=====>] 13.44K  --.-KB/s   in 0.06s

2019-08-08 11:32:00 (226 KB/s) - 'apt-cyg' saved [13765/13765]

User@DESKTOP-PKU29JR ~
$
```

19. Type the following command and press “Enter”

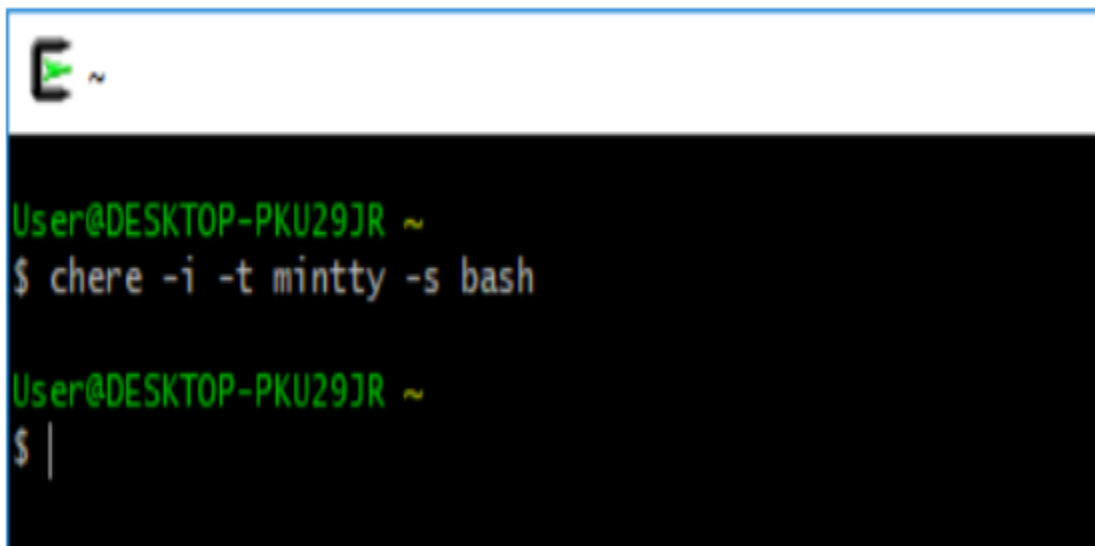
`install apt-cyg /bin`

A screenshot of a Cygwin terminal window with a black background and green text. The prompt is 'User@DESKTOP-PKU29JR ~' and the command 'install apt-cyg /bin' is being entered.

"apt-cyg" is a command in Cygwin similar to the "sudo apt-get" command in Linux. It is used to install packages, update them, list them, etc.

20. Type the following command and press “Enter”

`chere -i -t mintty -s bash`

A screenshot of a Cygwin terminal window. The top part shows a green 'E ~' icon. Below, the prompt is 'User@DESKTOP-PKU29JR ~' and the command 'chere -i -t mintty -s bash' is entered. The next line shows the prompt 'User@DESKTOP-PKU29JR ~' and a new shell prompt '\$ |'.

This will allow us to open a Cygwin bash terminal from any folder in your Windows File Explorer or other applications.

21. Type the following command on Cygwin terminal and press “Enter”.

apt-cyg install libboost-devel

This installs the Boost Library. A progress message will show the installation.

```
User@DESKTOP-PKU29JR ~
$ apt-cyg install libboost-devel
Installing libboost-devel
--2019-08-08 11:49:37-- http://cygwin.mirror.constant.com/x86_64/release/boost/libboost-devel/libb
oost-devel-1.66.0-1.tar.xz
Resolving cygwin.mirror.constant.com (cygwin.mirror.constant.com)... 108.61.5.83
Connecting to cygwin.mirror.constant.com (cygwin.mirror.constant.com)|108.61.5.83|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 10953344 (10M) [application/octet-stream]
Saving to: 'libboost-devel-1.66.0-1.tar.xz'

libboost-devel-1.66.0-1. 100%[=====>] 10.45M 629KB/s in 17s

2019-08-08 11:49:55 (625 KB/s) - 'libboost-devel-1.66.0-1.tar.xz' saved [10953344/10953344]

libboost-devel-1.66.0-1.tar.xz: OK
Unpacking...
Package libboost-devel requires the following packages, installing:
libboost_atomic1.63 libboost_atomic1.64 libboost_atomic1.66 libboost_chrono1.63 libboost_chrono1.64
libboost_chrono1.66 libboost_container1.63 libboost_container1.64 libboost_container1.66 libboost_co
ntext1.63 libboost_context1.64 libboost_context1.66 libboost_coroutine1.63 libboost_coroutine1.64 li
bboost_coroutine1.66 libboost_date_time1.63 libboost_date_time1.64 libboost_date_time1.66 libboost_f
iber1.64 libboost_filesystem1.63 libboost_filesystem1.64 libboost_filesystem1.66 libboost_graph1.63
libboost_graph1.64 libboost_graph1.66 libboost_iostreams1.63 libboost_iostreams1.64 libboost_iostrea
```

Downloading HCM-ERP software

1. Install Git(User can use Git bash or any other software of choice to clone the project).
2. Create a new folder for the project. Right Click inside the folder and open a git bash here.
Right Click + "Git Bash here".
3. Type the following command in the git terminal:
Git clone <https://github.com/raghvendra-singh-rana/HCM-ERP.git>
4. Or go to the link <https://github.com/raghvendra-singh-rana/HCM-ERP.git> and click on Clone or Download and download the zip folder of the software.

Compiling and Running the HCM-ERP

To compile and run the tests for the software, follow these steps:

1. Compile the project
 - i. Open the folder containing the cloned or downloaded software from git.
 - ii. Open Bash Prompt inside the folder i.e. Right Click + "Bash Prompt here".
 - iii. To compile the project, type in the bash prompt :
Make clean; make all

**** NOTE:** The complete folder structure, code and the documentation is available in the git repository –

<https://github.com/raghvendra-singh-rana/HCM-ERP.git>

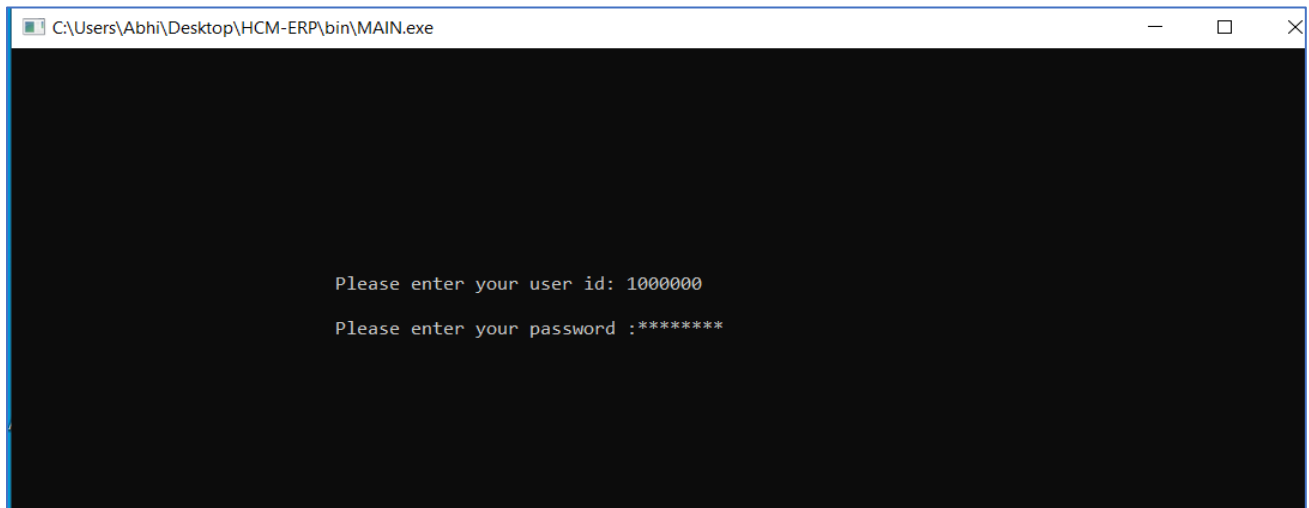
How to run HCM-ERP

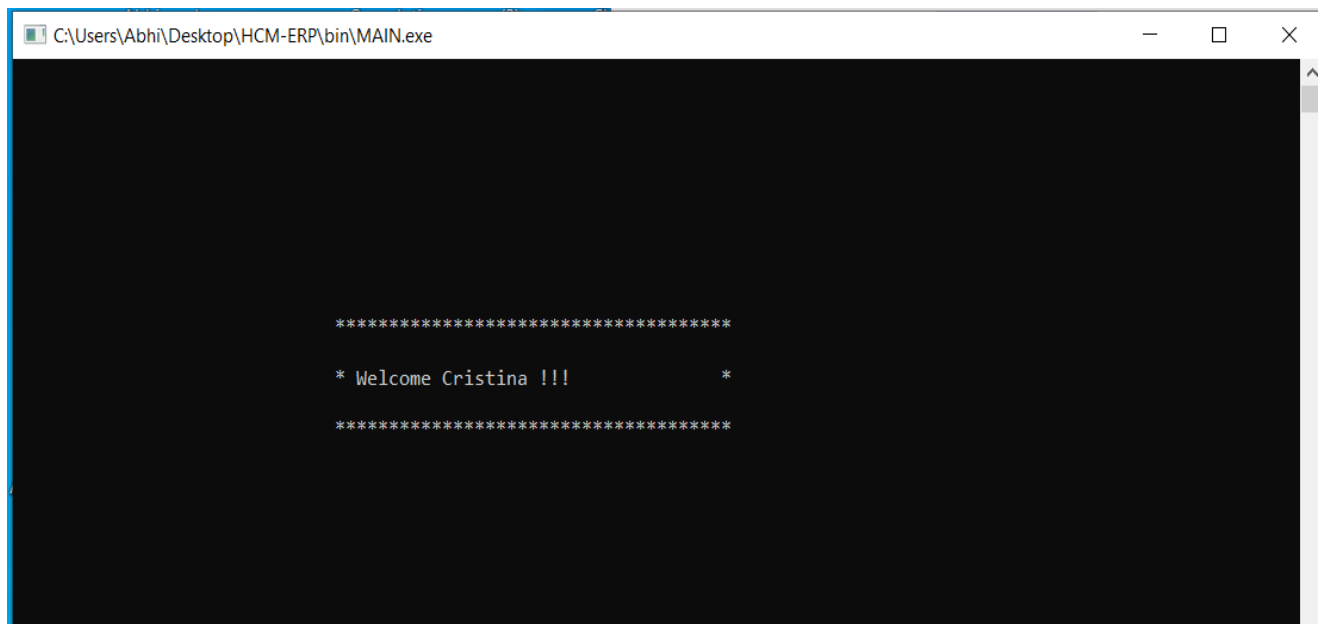
HCM-ERP is a software that is used to maintain the most valuable part of any organization. This manual is divided into two parts that are:

- 1.) Admin User Manual
- 2.) Employee User Manual

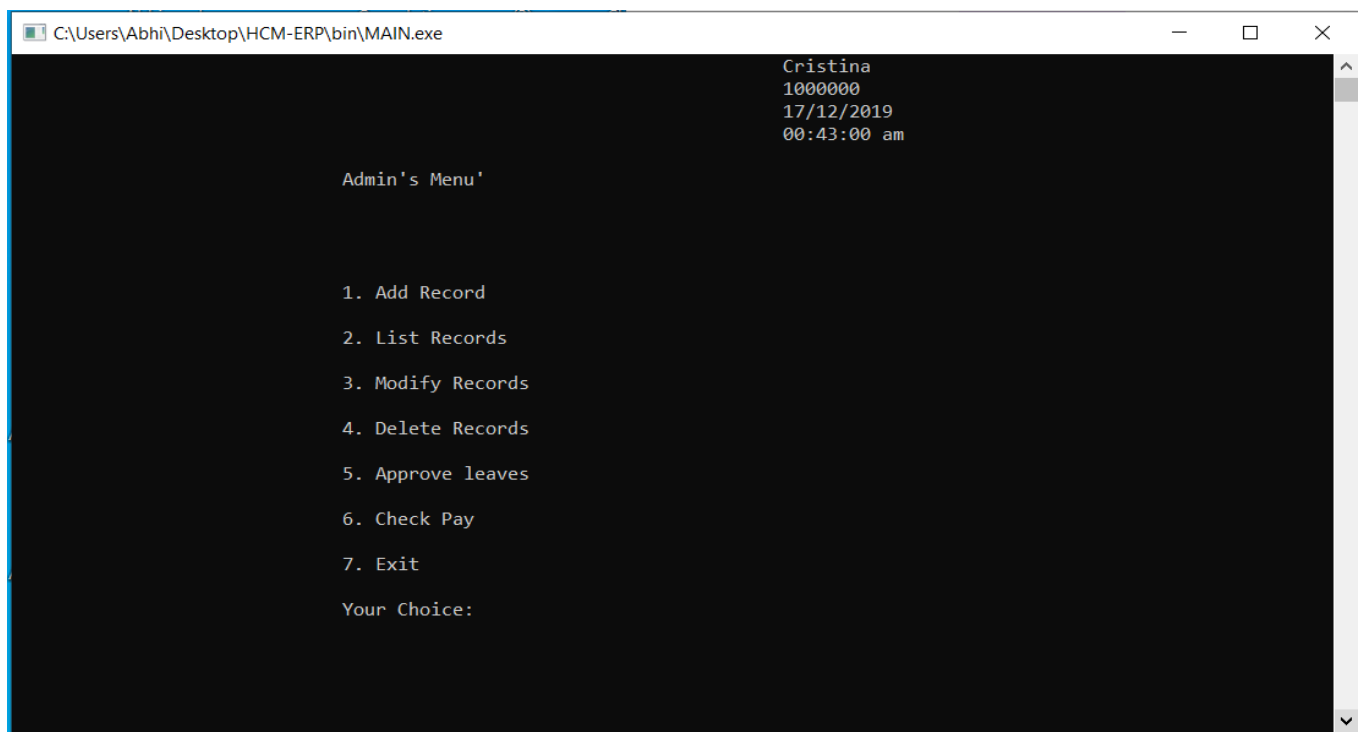
1.Admin User Manual

1.1 The admin is given the rights to create and maintain employee records. First of all to login as Admin the user id is 1000000 and the password is “cristina”.

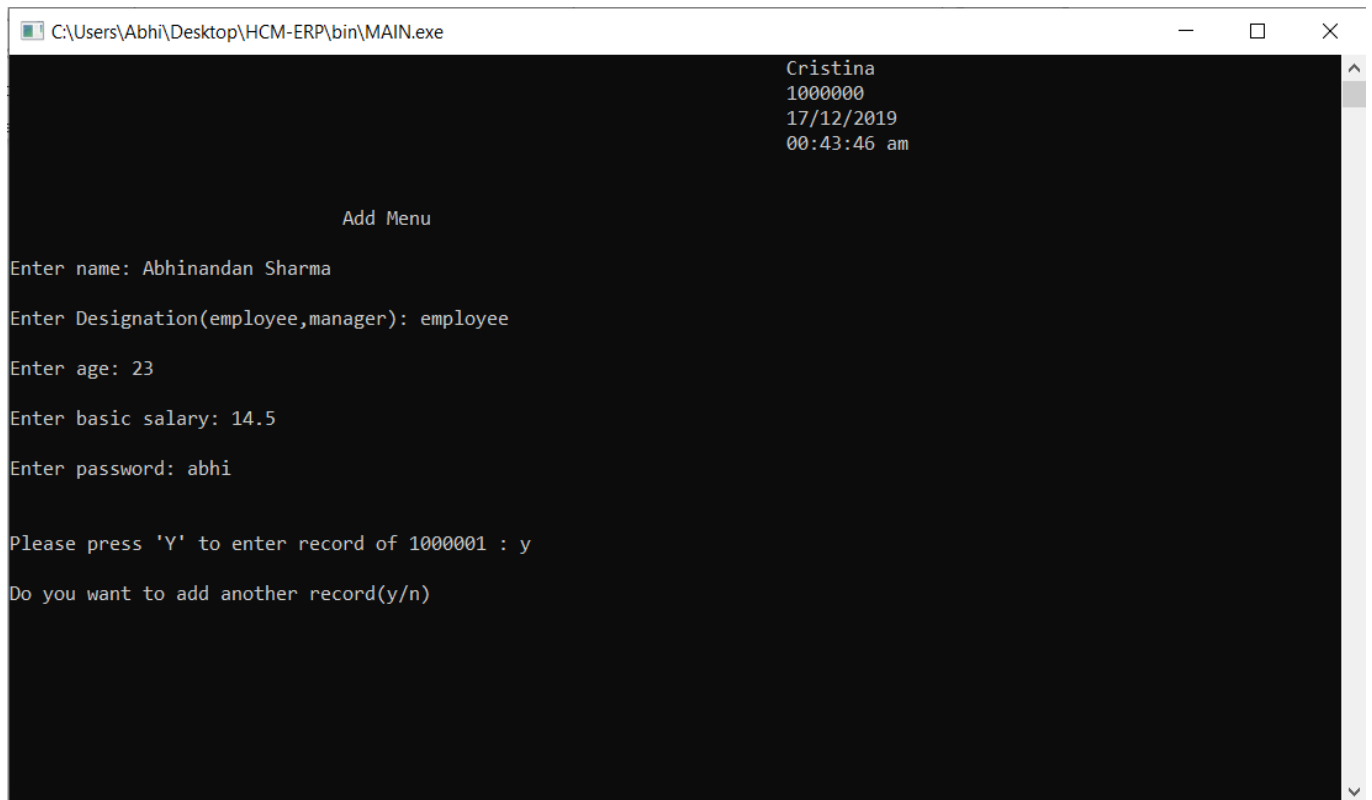




1.2 After logging in, Admin can see the following options



1.2.1 If the admin chooses to add record then it will have to enter choice as 1 and the following screen will be opened.



```
C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe

Cristina
1000000
17/12/2019
00:43:46 am

Add Menu

Enter name: Abhinandan Sharma

Enter Designation(employee,manager): employee

Enter age: 23

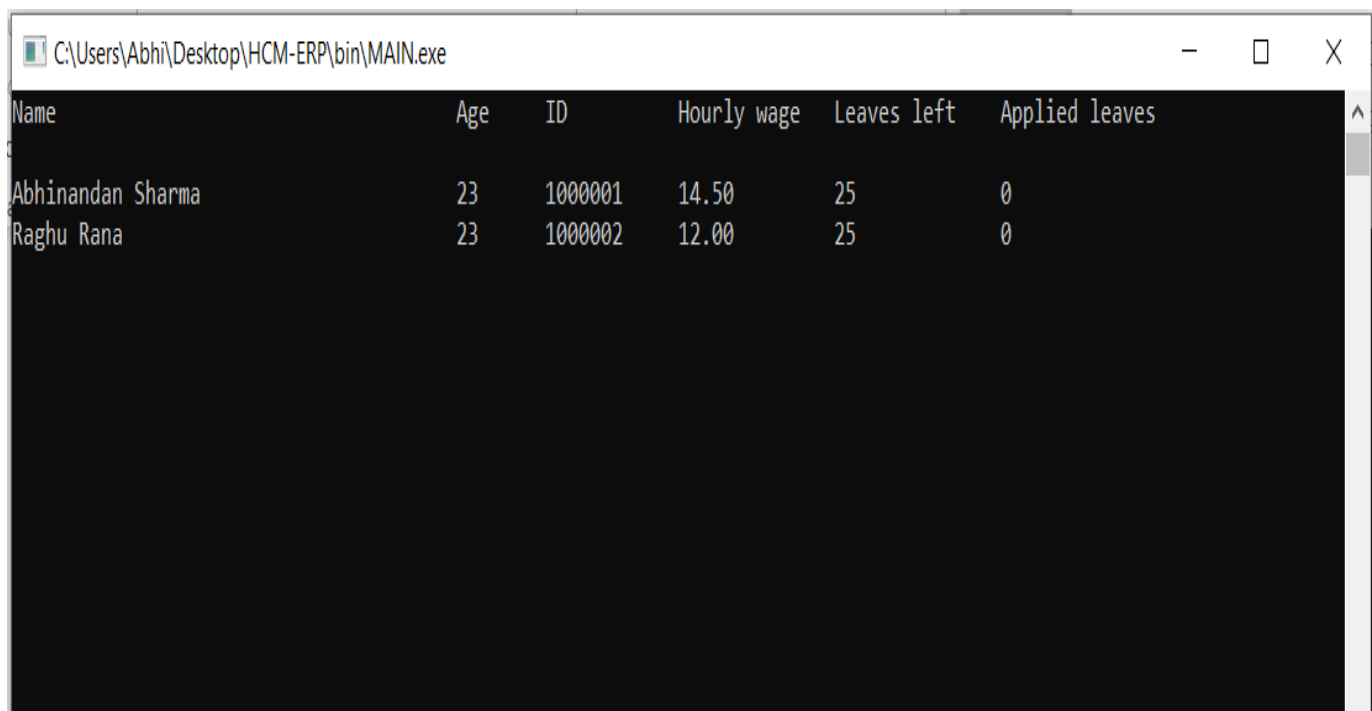
Enter basic salary: 14.5

Enter password: abhi

Please press 'Y' to enter record of 1000001 : y

Do you want to add another record(y/n)
```

1.2.2 To see the list of added employees, admin needs to enter choice as 2 and the following screen will display all the record with user id incremented with one each time.



```
C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe

Name           Age  ID      Hourly wage  Leaves left  Applied leaves
Abhinandan Sharma  23  1000001  14.50       25           0
Raghu Rana        23  1000002  12.00       25           0
```

1.2.3 If the admin wants to modify the records of the employee then it has to enter the choice as 3 and the following screen will be displayed to modify the record.

```
C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe

Cristina
1000000
17/12/2019
00:46:56 am

Modify Screen

Enter the employee id to modify: 1000001

Record found with below details :-

Name :Abhinandan Sharma

Age : 23
Basic Salary : 14.500000
Designation : employee

Please enter new details :-

Name : Abhi S

Enter Designation(employee,manager) :Manager

Enter age: 24

Enter basic salary: 15
```

After modifying the changes admin can see the changes by opting the choice 2 again and listing the record.

Name	Age	ID	Hourly wage	Leaves left	Applied leaves
Abhi S	24	1000001	15.00	25	0
Raghu Rana	23	1000002	12.00	25	0

1.2.4 If admin wants to delete a record it has to enter the choice as 4. The admin can check whether the record is deleted by using the display lists option.

```
C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe

Enter id of employee to delete: 1000002

Record found with below details :-

Name :Raghu Rana

Age : 23
Basic Salary : 12.000000
Designation : employee

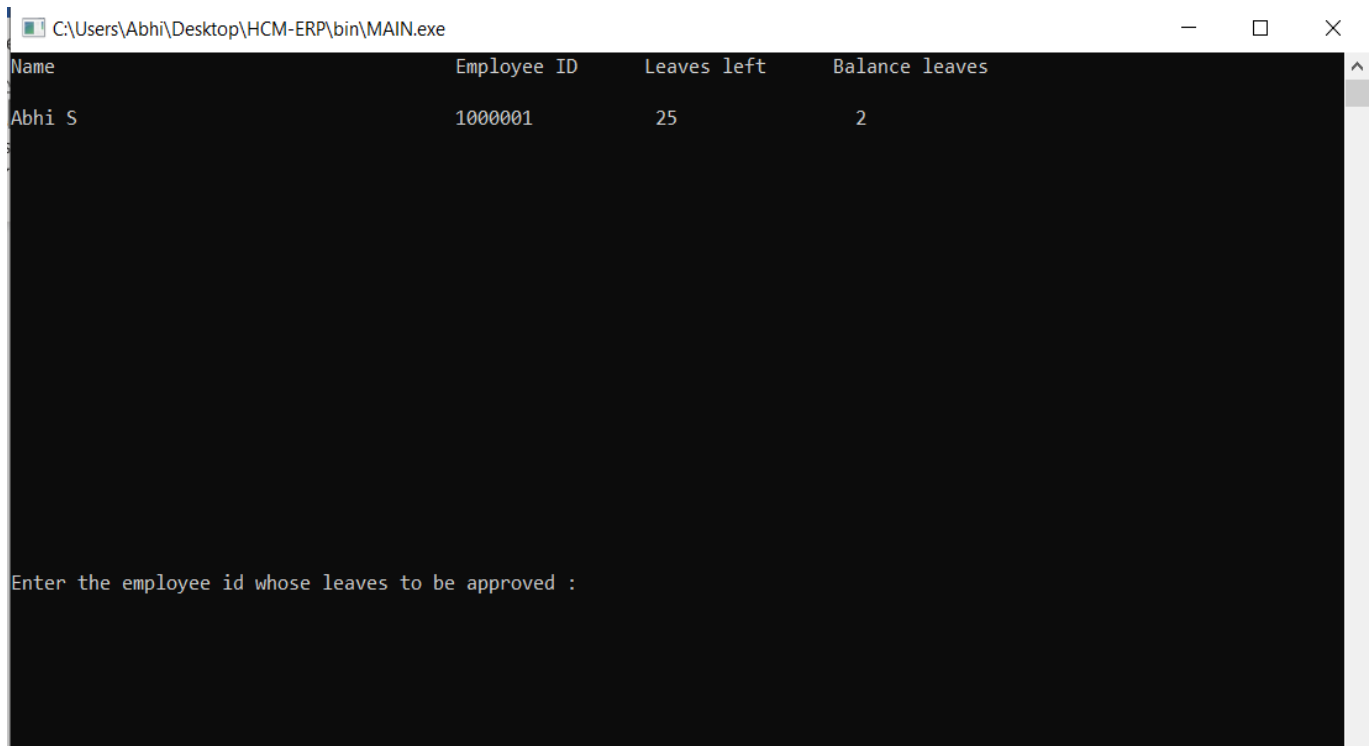
Press 'y' to confirm deletion : y

Delete another record(y/n)
```

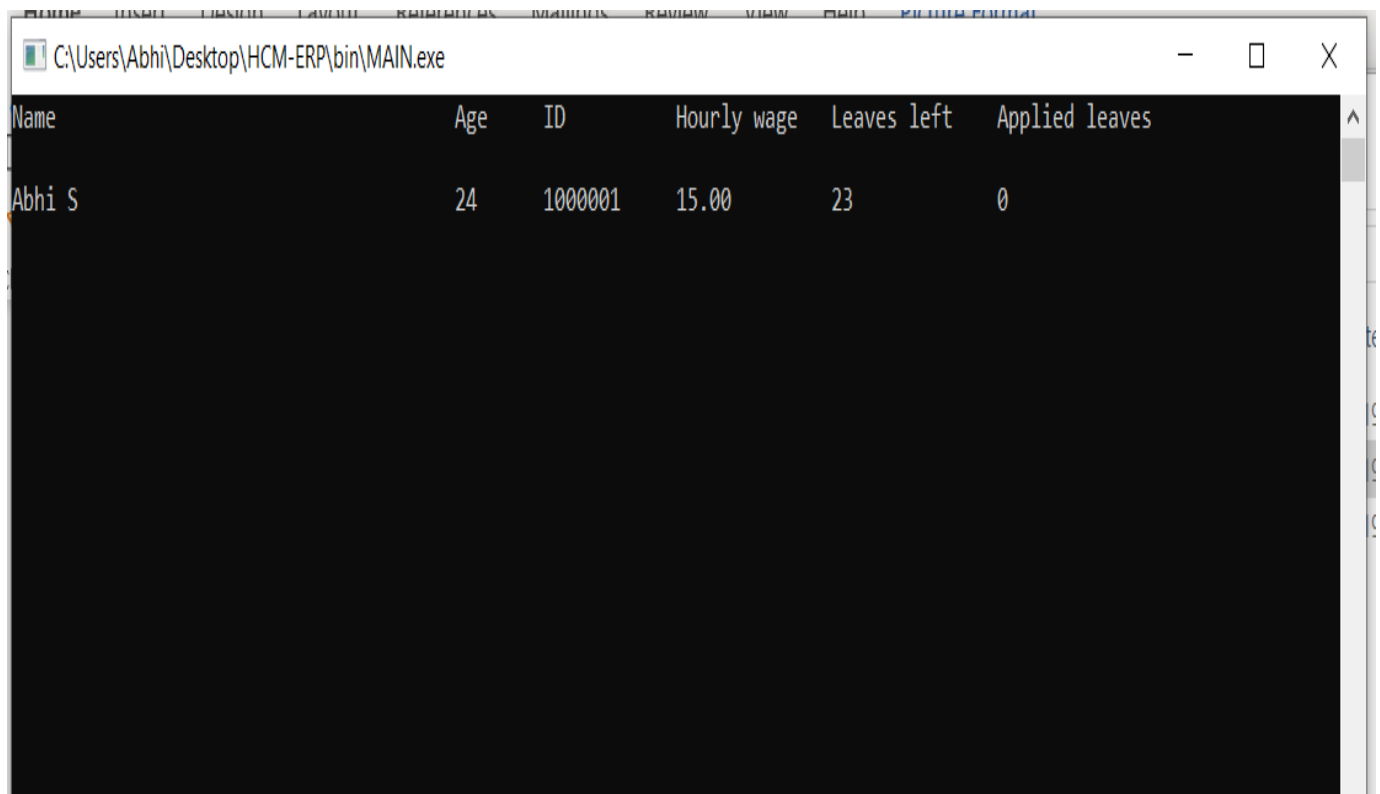
```
C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe

Name                Age   ID      Hourly wage  Leaves left  Applied leaves
Abhi S              24   1000001   15.00        25           0
```

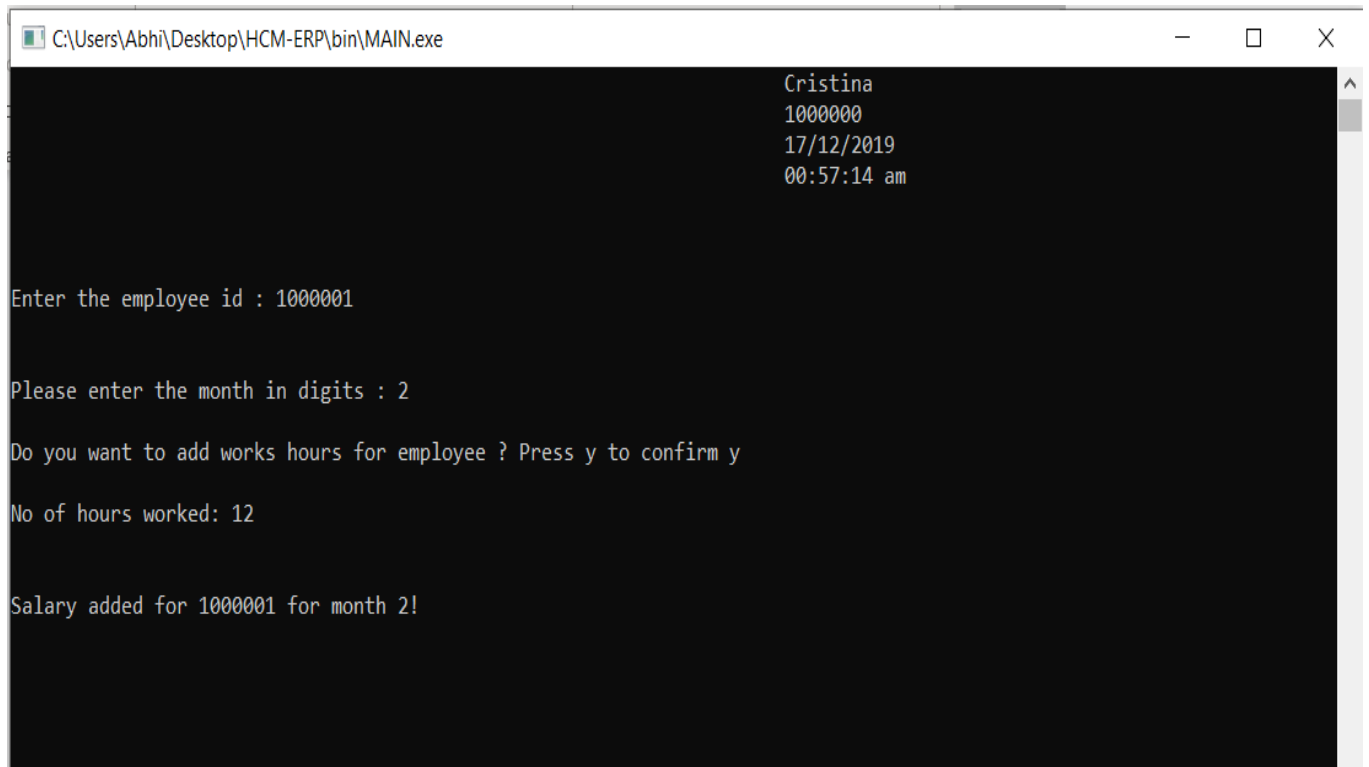
1.2.5 The fifth choice is used to approve the leaves applied by the employees by typing the employee id of the employee whose leave the admin wants to approve.



The changes made by the admin can be seen by selecting the list option from admin menu.



1.2.6 The sixth and the last option is to check the pay of the employee. This option is used to generate the paystub of the employee.



```
C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe

Cristina
1000000
17/12/2019
00:57:14 am

Enter the employee id : 1000001

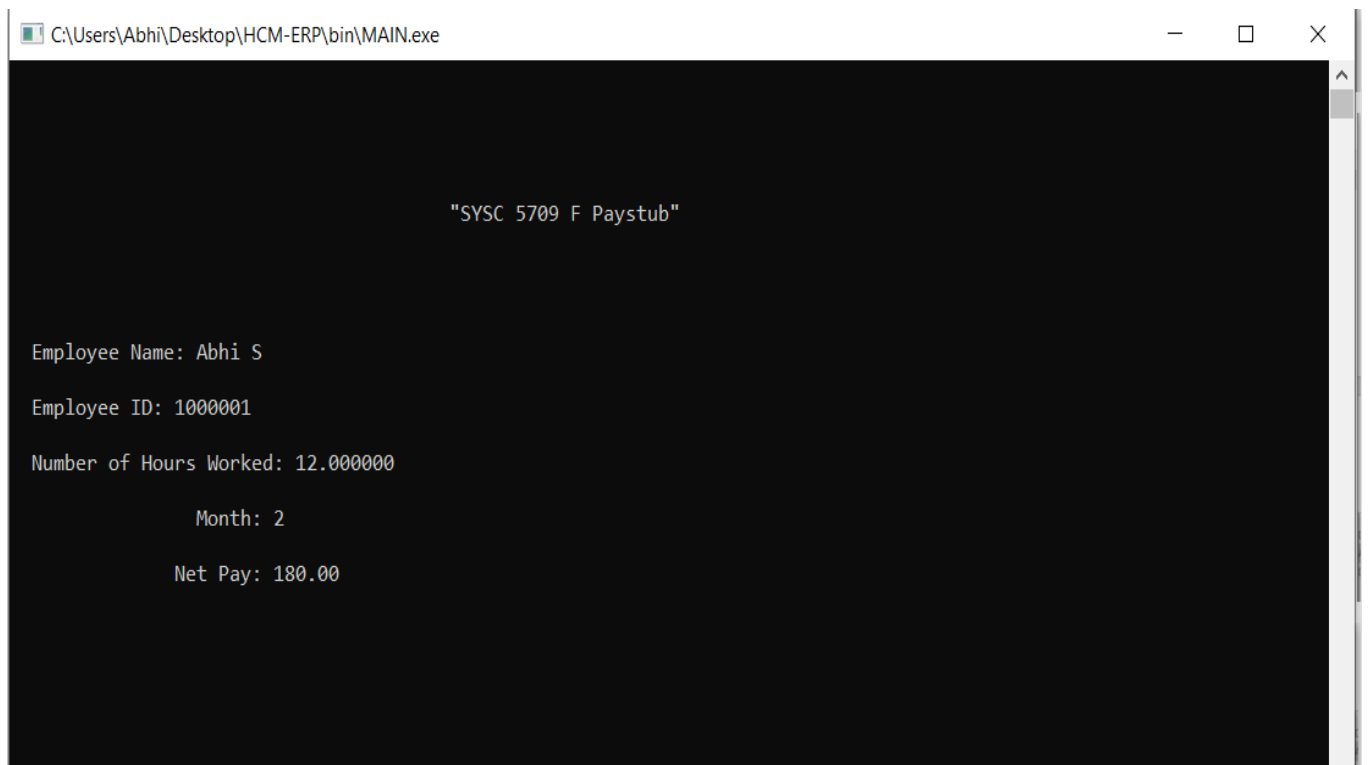
Please enter the month in digits : 2

Do you want to add works hours for employee ? Press y to confirm y

No of hours worked: 12

Salary added for 1000001 for month 2!
```

After generating the paystub, the employee can check his/her pay as shown below.



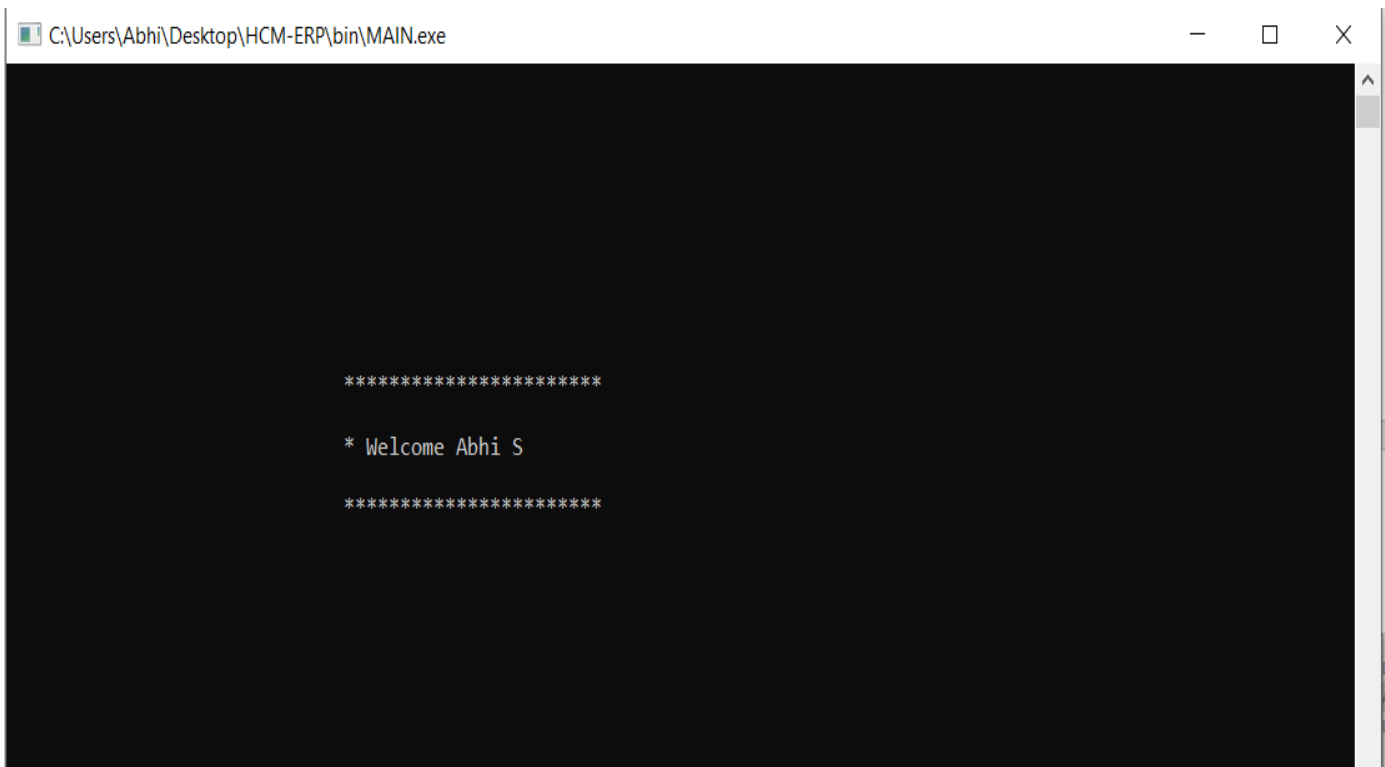
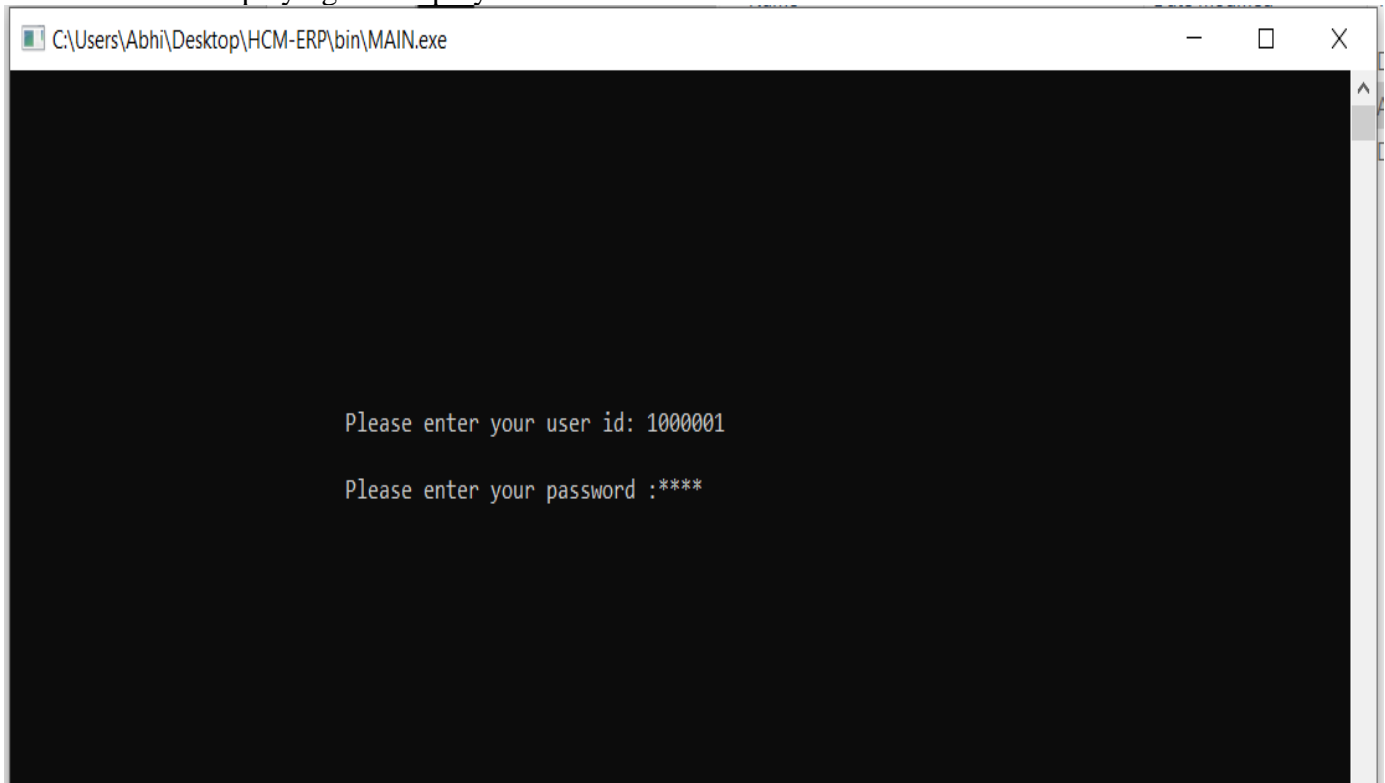
```
C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe

"SYSC 5709 F Paystub"

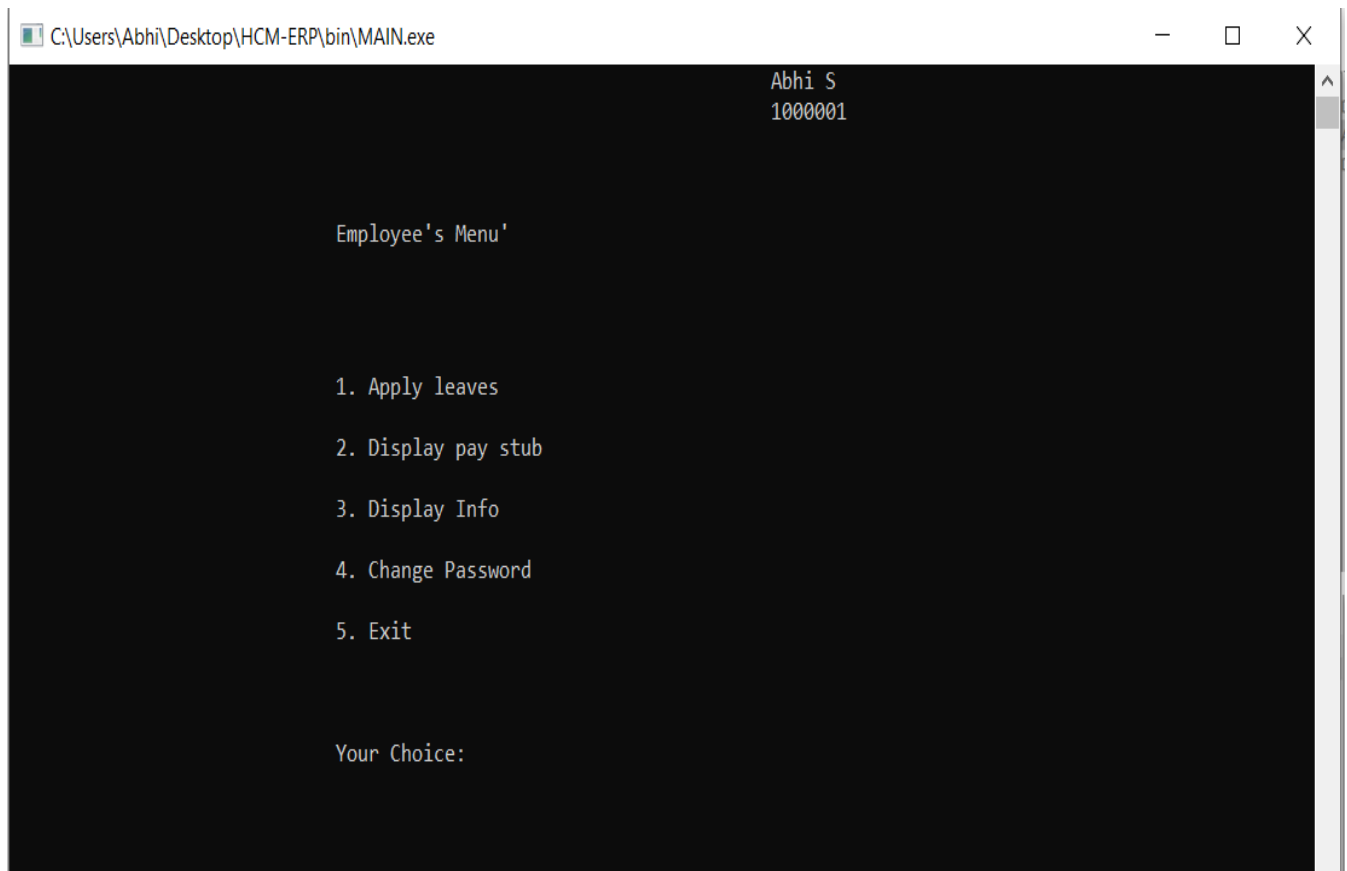
Employee Name: Abhi S
Employee ID: 1000001
Number of Hours Worked: 12.000000
      Month: 2
      Net Pay: 180.00
```

2. Employee User Manual

2.1 If the user enters the credentials of employee it will be logged in to the employee menu. The screenshot displaying the employee menu as shown below.



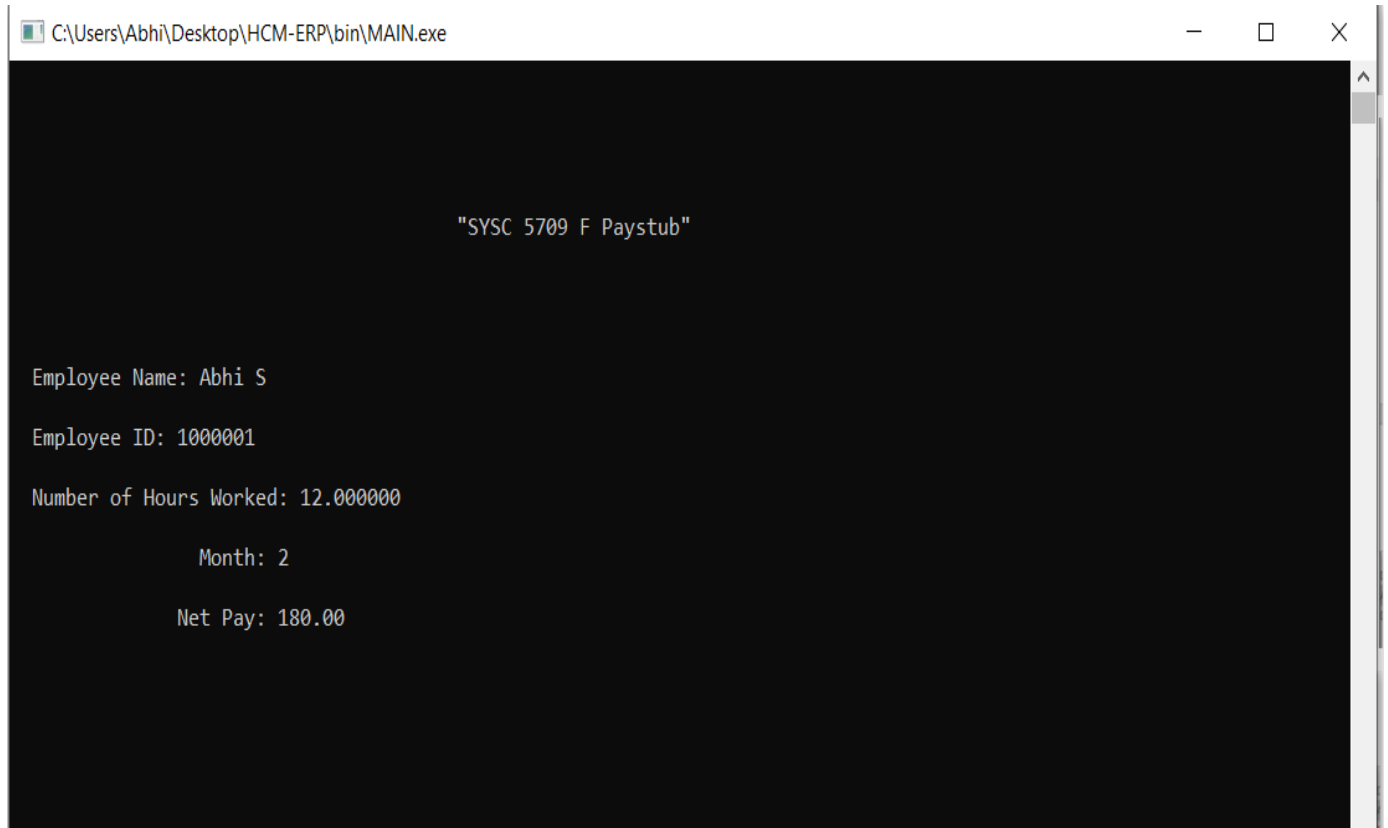
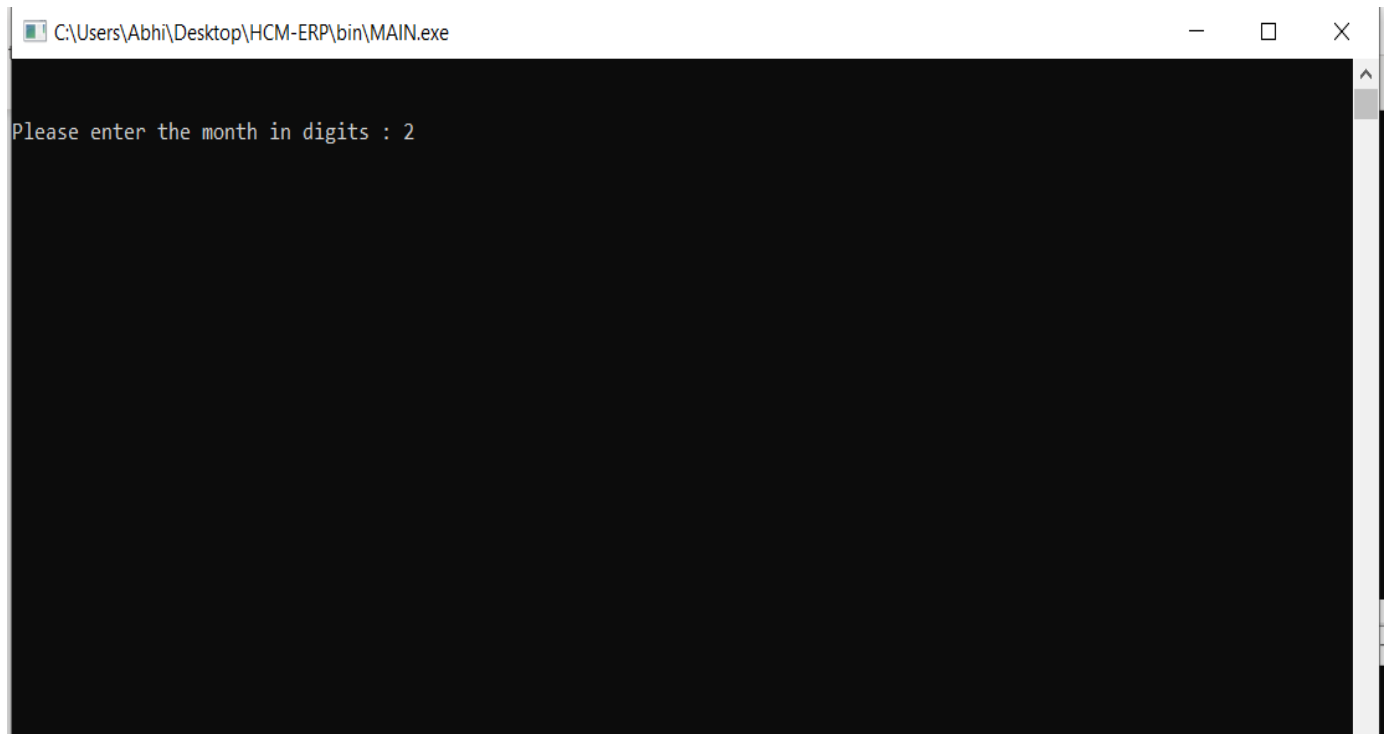
2.2 The employee menu has the following options



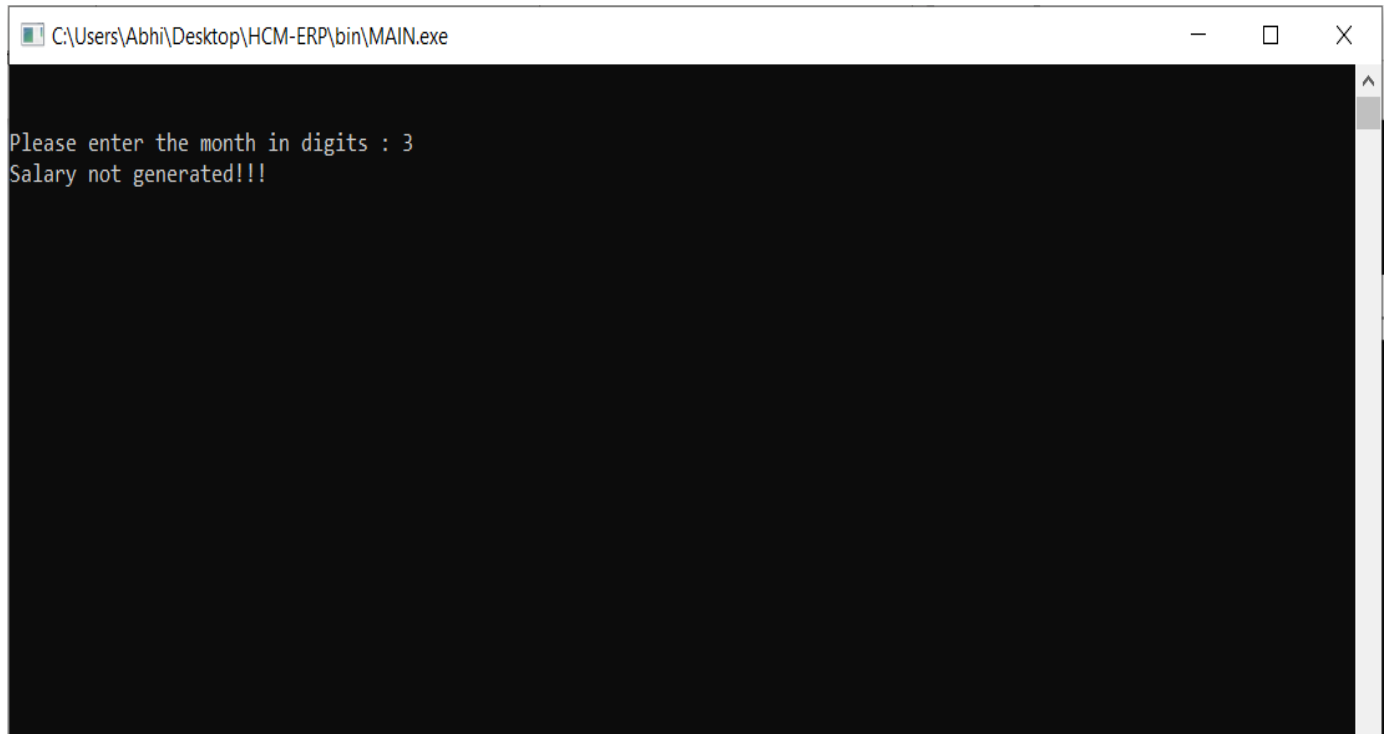
2.2.1 The choice 1 of the employee menu is used to apply for the leave. The choice 1 will display the following screen.



2.2.2 The second choice in the employee menu is used to display the pay stub of the employee. The employee needs to enter the month in digits to check the paystub.

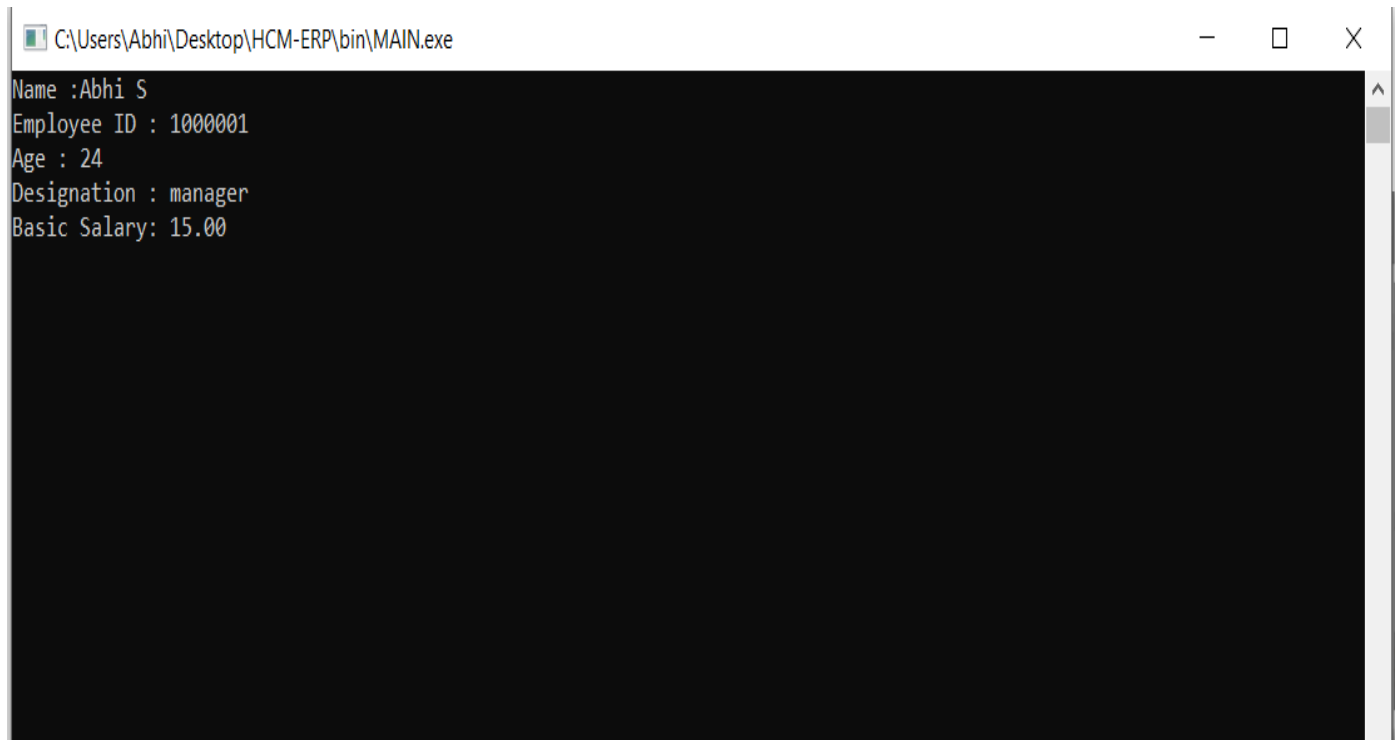


If the employee enters the wrong month for which the salary has not been generated it will give an error as shown below.



A screenshot of a Windows command prompt window. The title bar shows the file path "C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe". The command prompt displays the text "Please enter the month in digits : 3" followed by "Salary not generated!!!".

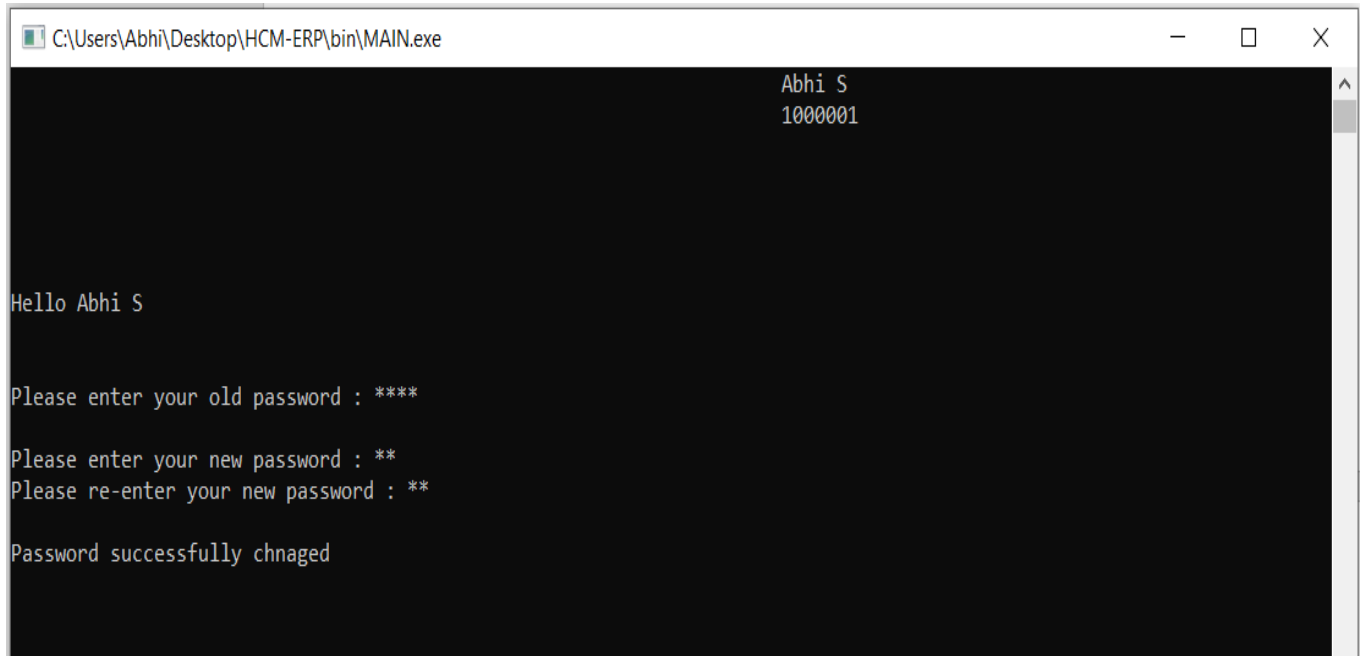
2.2.3 The third choice of the employee menu is used to display all the basic information of employee.



A screenshot of a Windows command prompt window. The title bar shows the file path "C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe". The command prompt displays the following text: "Name :Abhi S", "Employee ID : 1000001", "Age : 24", "Designation : manager", and "Basic Salary: 15.00".

2.2.4 The fourth option in the employee manual is used if the employee wants to change the password. After selecting the fourth choice the employee needs to enter the correct old password and new password and the password will be changed successfully.

If the employee enters incorrect old password or the new password and re-enter new password doesn't match the employee will receive an error message.



```
C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe

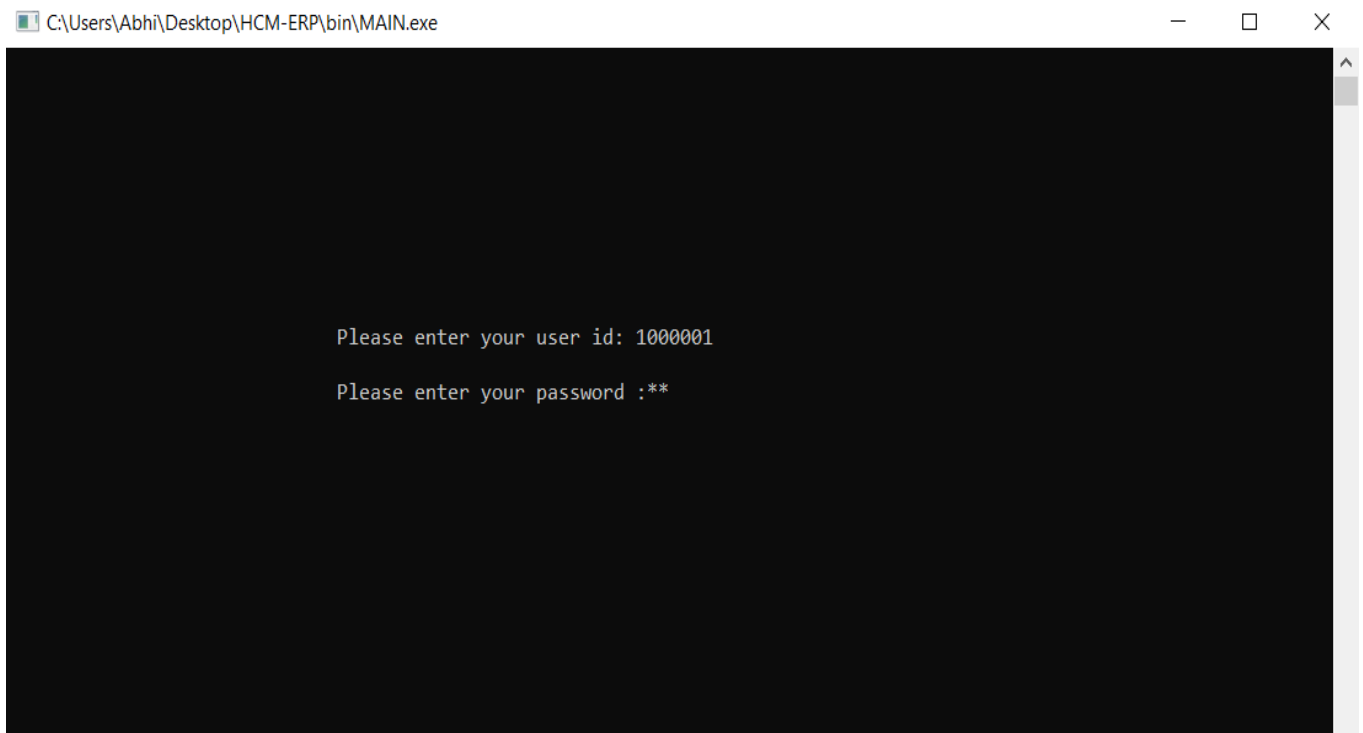
Abhi S
1000001

Hello Abhi S

Please enter your old password : ****

Please enter your new password : **
Please re-enter your new password : **

Password successfully chnaged
```



```
C:\Users\Abhi\Desktop\HCM-ERP\bin\MAIN.exe

Please enter your user id: 1000001

Please enter your password :**
```