SLIIT
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BSc (Hons) in Information Technology
Year 1

Tutorial 02

IT1050 – Object Oriented Concepts — Semester 1, 2021

Objectives : This Tutorial focusses on converting C programs to C++. You will notice all the control structures that you have learnt in C for example the if, if else, switch, case, for, while, do while all work exactly the same in C++. More over all calculations work the same way. The only difference are the print and input statements.

Exercise 0

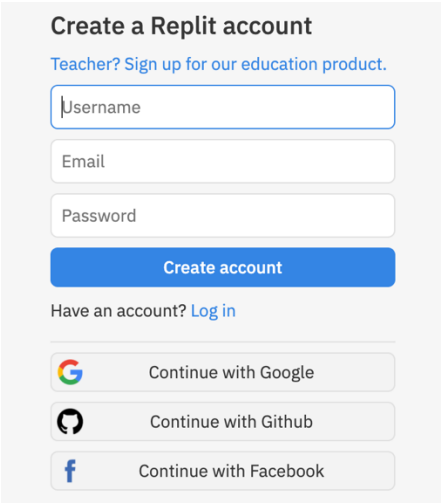
a) If you haven't done the Tutorial 01 as described in the courseweb, please use Exercise 0 of Tutorial 01 to setup Github and Repl.it commands in the exact way it is describe. Please look at a guided video about doing this and relevance of GitHub. You need to do only step a) of Exercise 0

Extracted from Tutorial 01 (Please don't do this if you did these steps earlier) – ee the accompanying video for further details.

a) Goto GitHub.com and create an account using your Student ID. Please use the user name as your Student id. Login to your GitHub account using the user name and password that you have given.

b) Goto Repl.IT

i) Logout from Repl.IT if you are already logged in
ii) Signup to Repl.IT from your GitHub Account (Select Continue with GitHub)



iii) if they ask you for your username, use your student id

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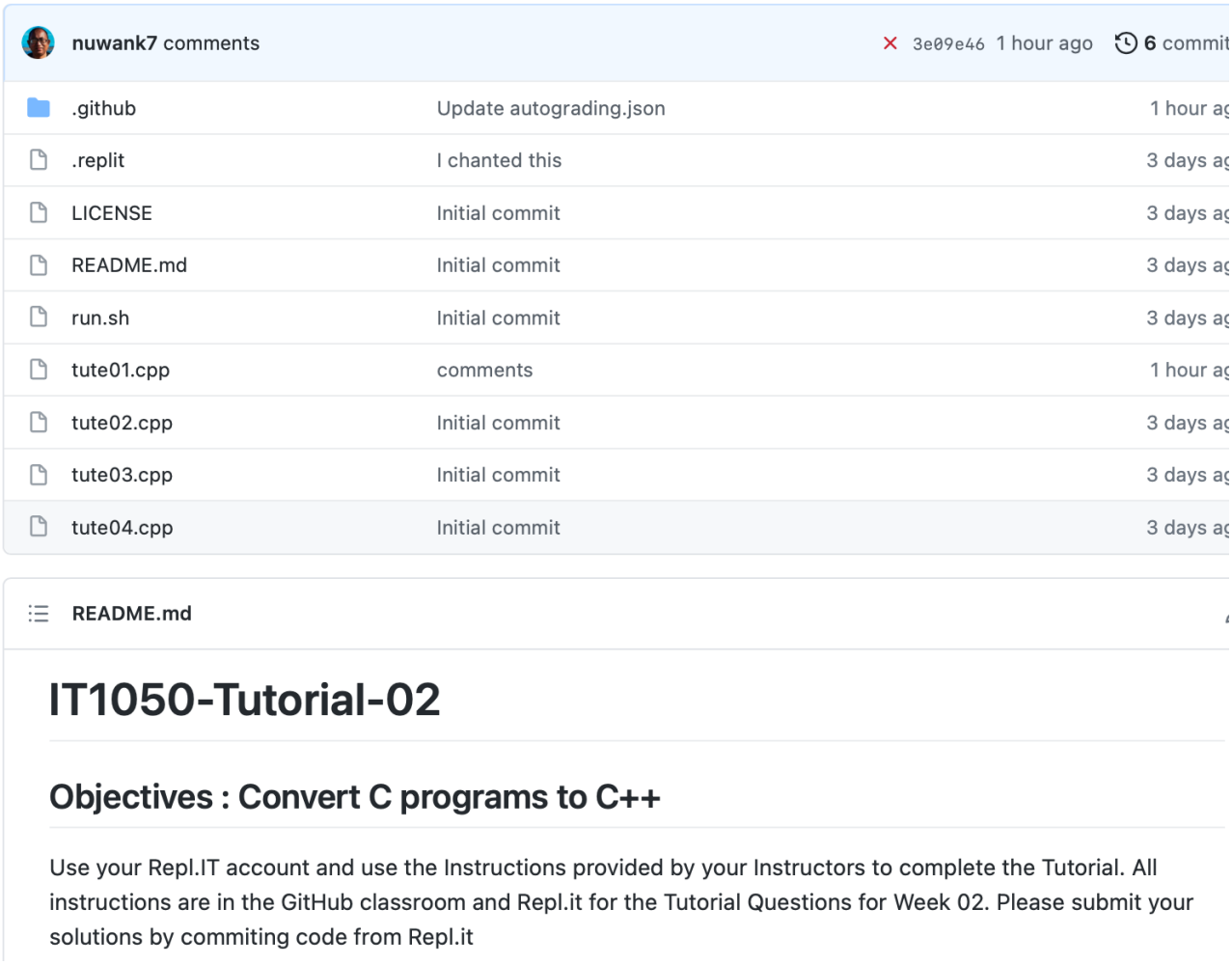
Exercise 0 - Continued

a) Copy the following url to a new browser window.
https://classroom.github.com/a/QYpGF04w

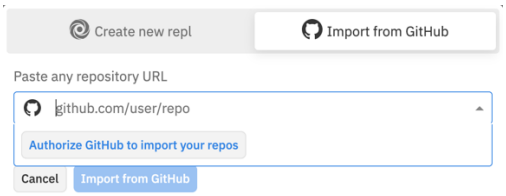
b) After a minute refresh your screen and to the GitHub Repository that has been created for you for Tutorial 02.

c) If you scroll down you should be able to see the 4 exercises that you need to complete. You need to convert the given C programs to C++

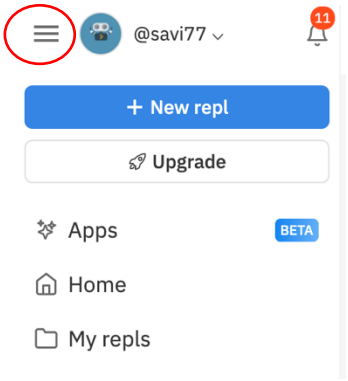


f) Goto your Rep.it account and open your GitHub repository in Rep.it

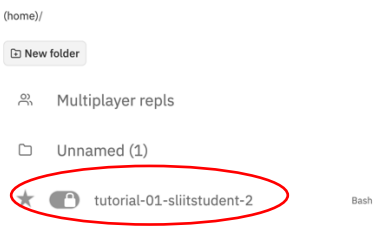
i) Copy the url of your Tutorial 02 Repo that was just created.
ii) Goto a new repl and select GitHub Repo



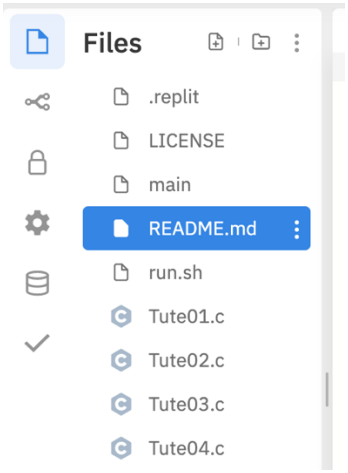
iii) Copy the GitHub url and select Import from Github
iv) You may need to Authorize Github to import your repos
vi) If you get an error indicating that you can't use a private repository, please try to use the following link in step C - https://classroom.github.com/a/7IZwz1Hf (see page 1)
vii) You can access your GitHub repo in Repl.It by selecting the left hand menu and selecting My Repls



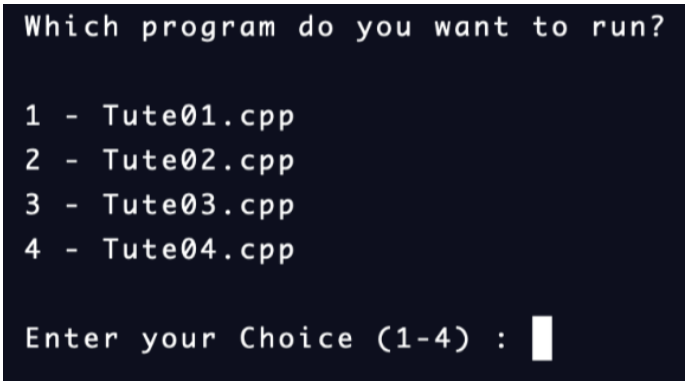
viii) Select your GitHub Repo. It should appear like this, names will be different



g) Complete the 4 exercises by selecting each of the partially completed program files, Tute01.cpp to Tute04.cpp



h) When running programs select which program you want to run from the console window.



i) After running your program you can test and see if your program is correct. Select Y to test your program.

```
Do you want to Test if your program is correct ? (Y/N) :y
1
Running test case for program 1 ....
Test case 1 FAILED
Running test case for program 1 ....
Test case 2 PASSED
Running test case for program 1 ....
Test case 3 FAILED
```

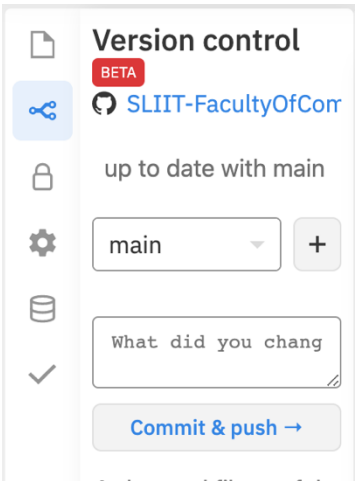
The above program has failed the testing, it means that there are some logical errors in your program.

```
Do you want to Test if your program is correct ? (Y/N) :y
1
Running test case for program 1 ....
Test case 1 PASSED
Running test case for program 1 ....
Test case 2 PASSED
Running test case for program 1 ....
Test case 3 PASSED
```

In the above screen shows when your program has passed the test cases given.

j) Submitting your programs to GitHub. Once you have finished all the programs you can submit your code to GitHub by committing it.

i) Select the Git Version Control command options from Repl.it



ii) Type a message in "What did you change" text box and select Commit & Push.

iii) You can go back to your GitHub account and see if all the changes you have done has been updated.

Note : These steps might look difficult to you at first but this is how developers setup a code repository and write code. Both git and github are used almost by everyone in the industry to maintain code.

If you find the above steps are not working or too difficult you can tryout to do the exercises in normal Repl.it. But try to resolve the issues with your instructors during the Tutorial Session.

Objectives : Convert C programs to C++

Use your Repl.IT account and use the Instructions provided by your Instructors to complete the Tutorial. All instructions are in the GitHub classroom and Repl.it for the Tutorial Questions for Week 02. Please submit your solutions by committing code from Repl.it

Exercise 1 - Calculations

Convert the C program given below which converts a length given in cm to inches to a C++ program.

Please Note that the input command in C++ is std::cin. This is a representation of the Keyboard.

e.g.

```
float data1;
int data2;
scanf("%f", &data1); --> std::cin >> data1;
scanf("%d", &data2); --> std::cin >> data2;
```

You already know that `printf()` in C is `std::cout` in C++ e.g.

```
printf("Hello World") --> std::cout << "Hello World";
```

2.54cm = 1 inch

```
#include <stdio.h>
void main(void)
{
    float cm, inches;
    printf("Enter a length in cm : ");
    scanf("%f",&cm);
    inches = cm / 2.54;
    printf("Length in inches is %f \n", inches);
}
```

Exercise 2 - Selection

Convert the C program given below which calculates an employee's salary to a C++ program.

Input Type, Salary, otHours

Type = 1
OtRate = 1000
Type = 2
OtRate = 1500
Type = 3
OtRate = 1700

Please Note that the input command in C++ is std::cin. This is a representation of the Keyboard.

```
#include <stdio.h>
void main(void)
{
   double salary, netSalary;
   int etype, otHrs, otRate;
   printf("Enter Employee Type : ");
   scanf("%d", &etype);
   printf("Enter Salary  : ");
   scanf("%f", &salary);
   printf("Enter OtHrs : ");
   scanf("%d", &otHrs);

   switch (etype) {
      case 1 :
          otRate = 1000;
          break;
      case 2 :
          otRate = 1500;
          break;
      default :
          otRate = 1700;
          break;
   }


   netSalary = salary + otHrs* otRate;
   printf("Net Salary is %f ", netSalary);
}
```

Exercise 3 - Repeatition

Convert the C program given below which calculates the Factorial of a number that you input from the keyboard to a C++ program.

Please Note that the input command in C++ is std::cin. This is a representation of the Keyboard.

```
#include <stdio.h>
void main(void)
{
    int no;
    long fac;

    printf("Enter a Number : ");
    scanf("%d", &no);

    fac = 1;
    for (int r=no; r >= 1; r--) {
        fac = fac * r;
    }

    printf("Factorial of %d is %ld\n", no, fac);
}
```

Exercise 4 - Functions

Write a program to calculate the function called nCr which is defined as

```
nCr = n!/ r!(n–r)!
```

Where n! is the factorial of n.

Implement the functions

```
long Factorial(int no);
long nCr(int n, int r);
```

Do not modify the main function.

```
#include <iostream>


long Factorial(int no);
long nCr(int n, int r);

int main() {
  int n, r;
  std::cout << "Enter a value for n ";
  std::cin >> n;
  std::cout << "Enter a value for r ";
  std::cin >> r;
  std::cout << "nCr = ";
  std::cout << nCr(n,r);
  std::cout << std::endl;
}
```