C to Python Translator

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Group No: 11

Group members:

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Problem Statement:

This project deals with the translation of code written in the C Programming Language to Python code.

Description:

- The main objective of this project is the line by line conversion of code written in C to Python syntax.
- This project can come in handy for a student learning the C-Programming Language with prior programming experience in Python. It will allow the student to easily draw parallels between the two syntaxes.
- It can also be used in the industry for comparing the two syntaxes and their compilation properties.
- Various functions have been defined in order to translate every part of a C program to Python. For example, the function, conditionConvert(), converts if - else if - else statements written in C to if – elif – else statements in Python.
- 2-Dimentional strings have been used to simplify iterations and nested iterations in the code.
- The program is executed by reading from a text file that consist of the C code to be translated and the translated code is written to an output file.

Concepts Used:

- Function: For every in-built function or control structure, a function has been defined which converts the C code into Python Syntax.

Extract from the project:

```
whiledo(a,&n);
swch(a,&n);
listConvert(a,&n);
variable(a,&n);
printFunction(a,&n);
```

- 2-Dimentional strings: C allows the user to store data in 2-Dimentional strings. A 2-Dimentional string consist of an array, each of whose elements in one line of C-code. The program reads each line of code and applies the appropriate function to that string.

  Extract from the project:

  ```
  char a[200][100],str[100],ch;
  ```

- File I/O: The program reads from a file that contains the C code as a 2-Dimentional string, converts the code to Python and writes the output to an output file.

  Extract from the project:

  ```
  fprintf(f2,"%s",a[i]);
  fprintf(f2,"%c",'\n');
  ```

- Control Structures: Various control structures such as For loops, While loops and Switch – case were used within the project.

  Extract from the project:

  ```
  for(int j = 0; j<strlen(inputData[i]); j++)
                          {
                                  if(inputData[i][j] == '<' && inputData[i][j+1] == '=')
                                  {
                                          strcat(innerStringTwo, "+1");
                                  }
                          }
  ```

- string.h library: Various functions from string.h were used in the program. For example, strlen, strcat, strcpy, strcmp and strncat were used.

  Extract from the project:

  ```
  strcat(inputData[i], " in range(");
  ```

- Pointers: pointers were used for inter-functional data usage. Data obtained from the user in main() was used in the other functions that were defined. This could be done only with the help of pointers.

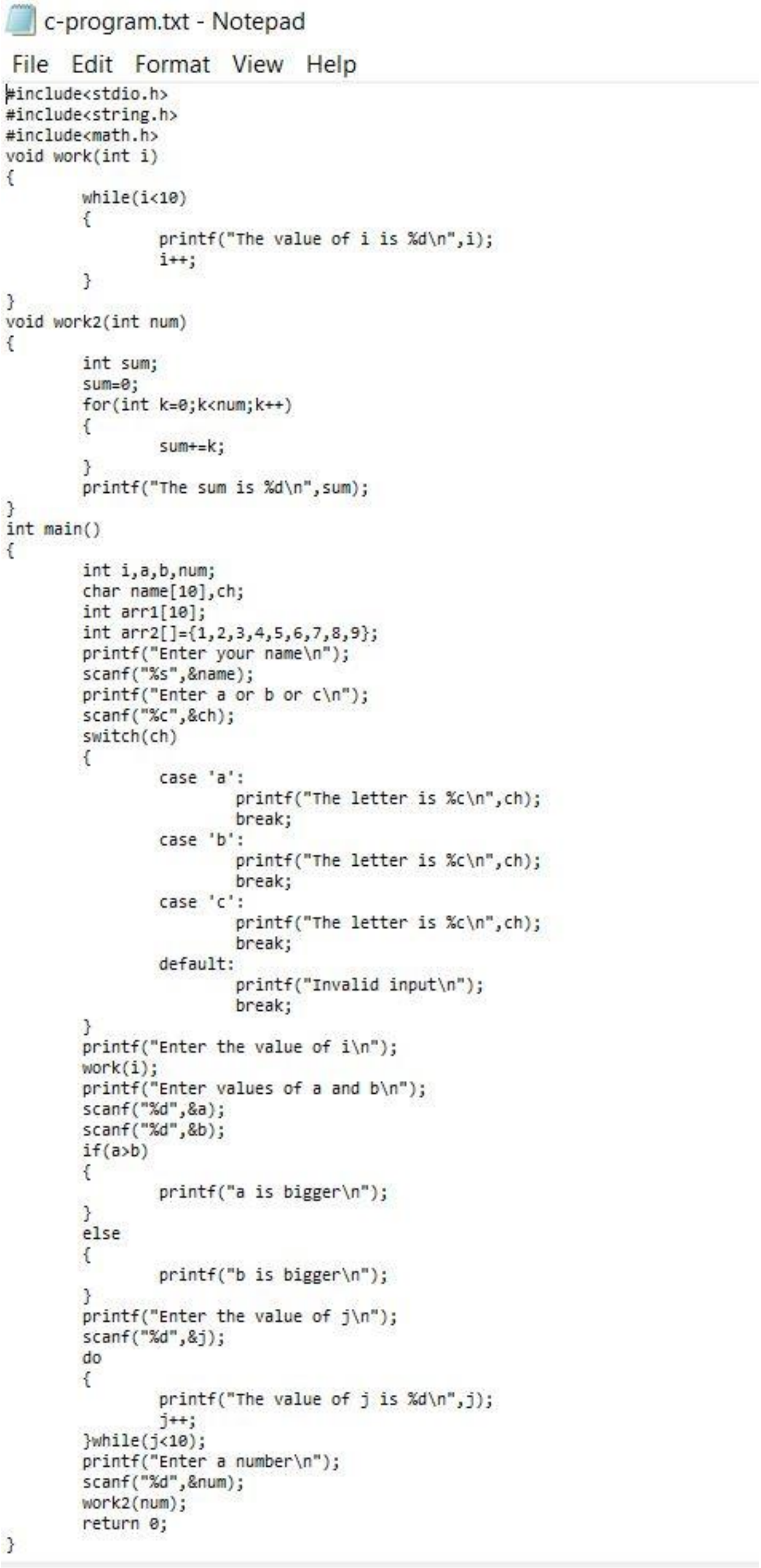
  Extract from the project:

  void variable(char a[200][100],int *num)

Learning Outcome:

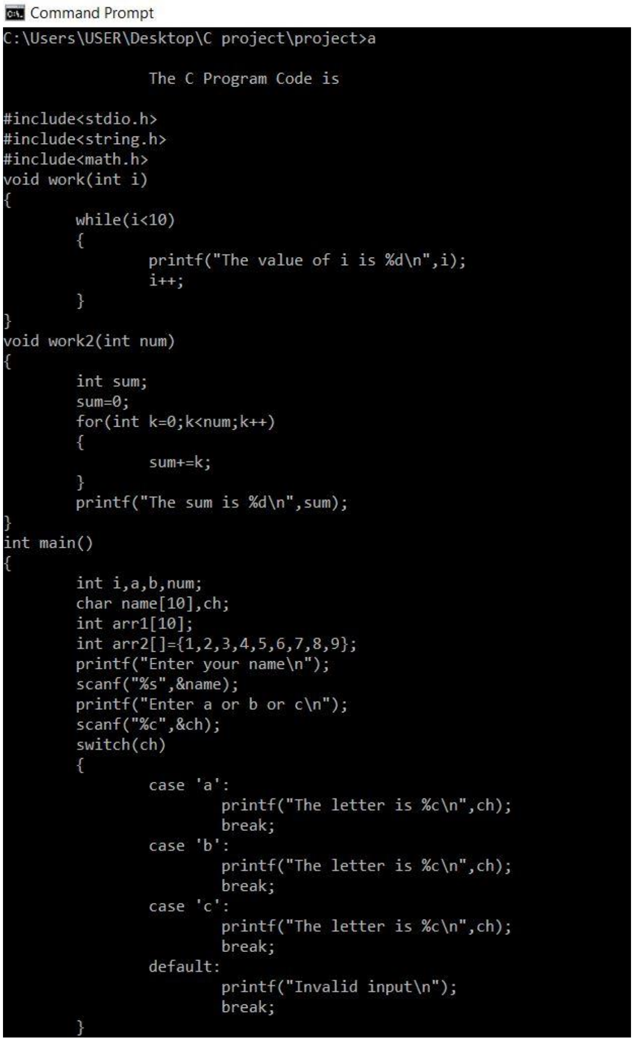
- Usage of 2-Dimentional strings in the C Programming Language
- Handling File Input and Output – Reading and writing to files
- Usage of the string library and its functions - strlen, strcat, strcpy, strcmp and strncat.
- Defining Functions with character array input.

Output Screenshots:



```
#include<stdio.h>
#include<string.h>
#include<math.h>
void work(int i)
{
        while(i<10)
        {
                printf("The value of i is %d\n",i);
                i++;
        }
}
void work2(int num)
{
        int sum;
        sum=0;
        for(int k=0;k<num;k++)
        {
                sum+=k;
        }
        printf("The sum is %d\n",sum);
}
int main()
{
        int i,a,b,num;
        char name[10],ch;
        int arr1[10];
        int arr2[]={1,2,3,4,5,6,7,8,9};
        printf("Enter your name\n");
        scanf("%s",&name);
        printf("Enter a or b or c\n");
        scanf("%c",&ch);
        switch(ch)
        {
                case 'a':
                        printf("The letter is %c\n",ch);
                        break;
                case 'b':
                        printf("The letter is %c\n",ch);
                        break;
                case 'c':
                        printf("The letter is %c\n",ch);
                        break;
                default:
                        printf("Invalid input\n");
                        break;
        }
        printf("Enter the value of i\n");
        work(i);
        printf("Enter values of a and b\n");
        scanf("%d",&a);
        scanf("%d",&b);
        if(a>b)
        {
                printf("a is bigger\n");
        }
        else
        {
                printf("b is bigger\n");
        }
        printf("Enter the value of j\n");
        scanf("%d",&j);
        do
        {
                printf("The value of j is %d\n",j);
                j++;
        }while(j<10);
        printf("Enter a number\n");
        scanf("%d",&num);
        work2(num);
        return 0;
}
```

Fig 1: c-program.txt (Input file)

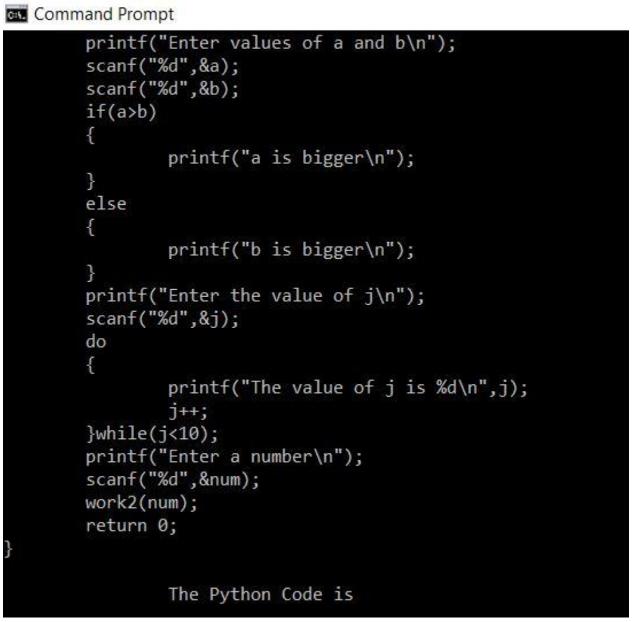


```
C:\Users\USER\Desktop\C project\project>a

                The C Program Code is

#include<stdio.h>
#include<string.h>
#include<math.h>
void work(int i)
{
        while(i<10)
        {
                printf("The value of i is %d\n",i);
                i++;
        }
}
void work2(int num)
{
        int sum;
        sum=0;
        for(int k=0;k<num;k++)
        {
                sum+=k;
        }
        printf("The sum is %d\n",sum);
}
int main()
{
        int i,a,b,num;
        char name[10],ch;
        int arr1[10];
        int arr2[]={1,2,3,4,5,6,7,8,9};
        printf("Enter your name\n");
        scanf("%s",&name);
        printf("Enter a or b or c\n");
        scanf("%c",&ch);
        switch(ch)
        {
                case 'a':
                        printf("The letter is %c\n",ch);
                        break;
                case 'b':
                        printf("The letter is %c\n",ch);
                        break;
                case 'c':
                        printf("The letter is %c\n",ch);
                        break;
                default:
                        printf("Invalid input\n");
                        break;
        }
```

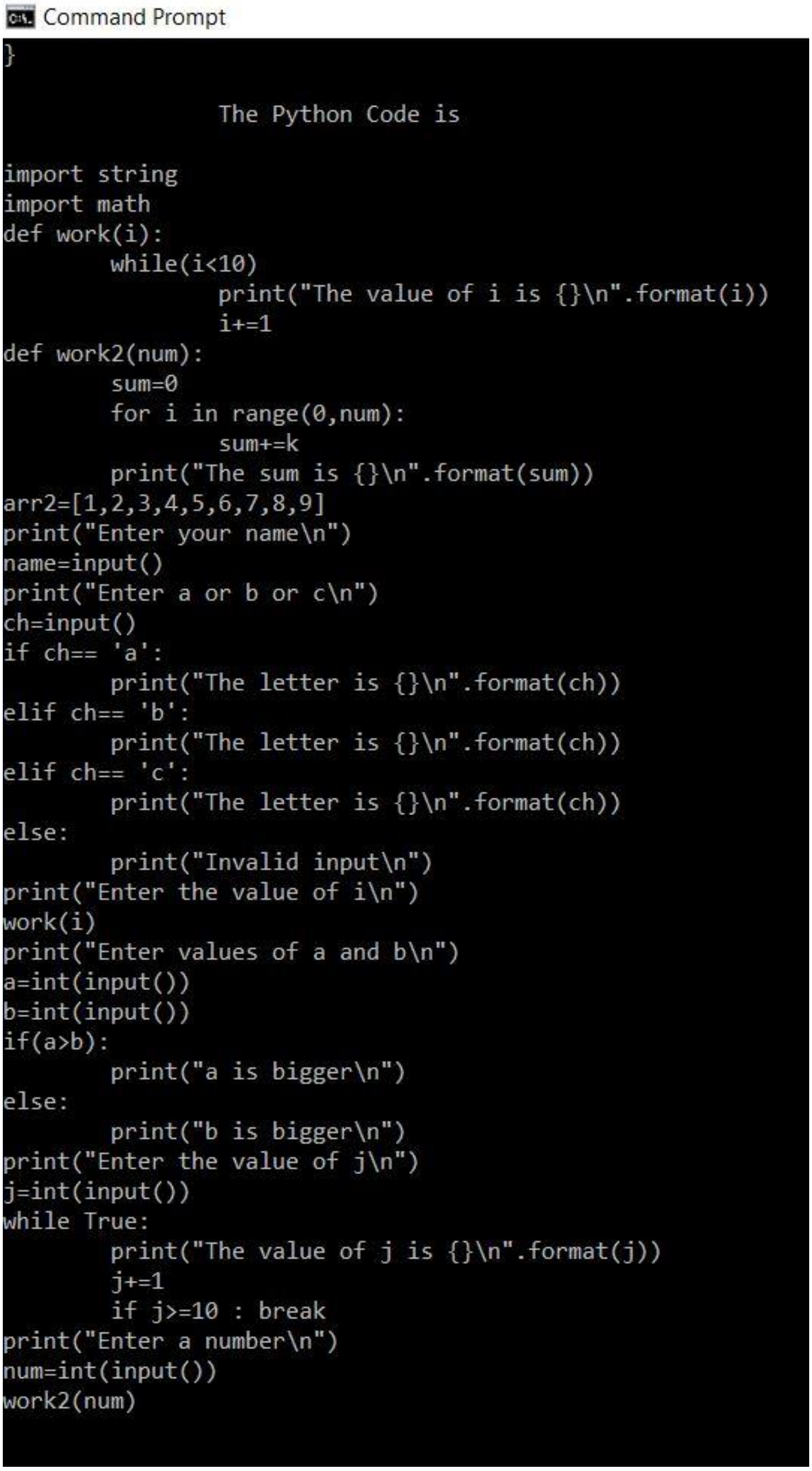
Fig 2: Program execution



```
        printf("Enter values of a and b\n");
        scanf("%d",&a);
        scanf("%d",&b);
        if(a>b)
        {
                printf("a is bigger\n");
        }
        else
        {
                printf("b is bigger\n");
        }
        printf("Enter the value of j\n");
        scanf("%d",&j);
        do
        {
                printf("The value of j is %d\n",j);
                j++;
        }while(j<10);
        printf("Enter a number\n");
        scanf("%d",&num);
        work2(num);
        return 0;
}

                The Python Code is
```

Fig 3: Program execution

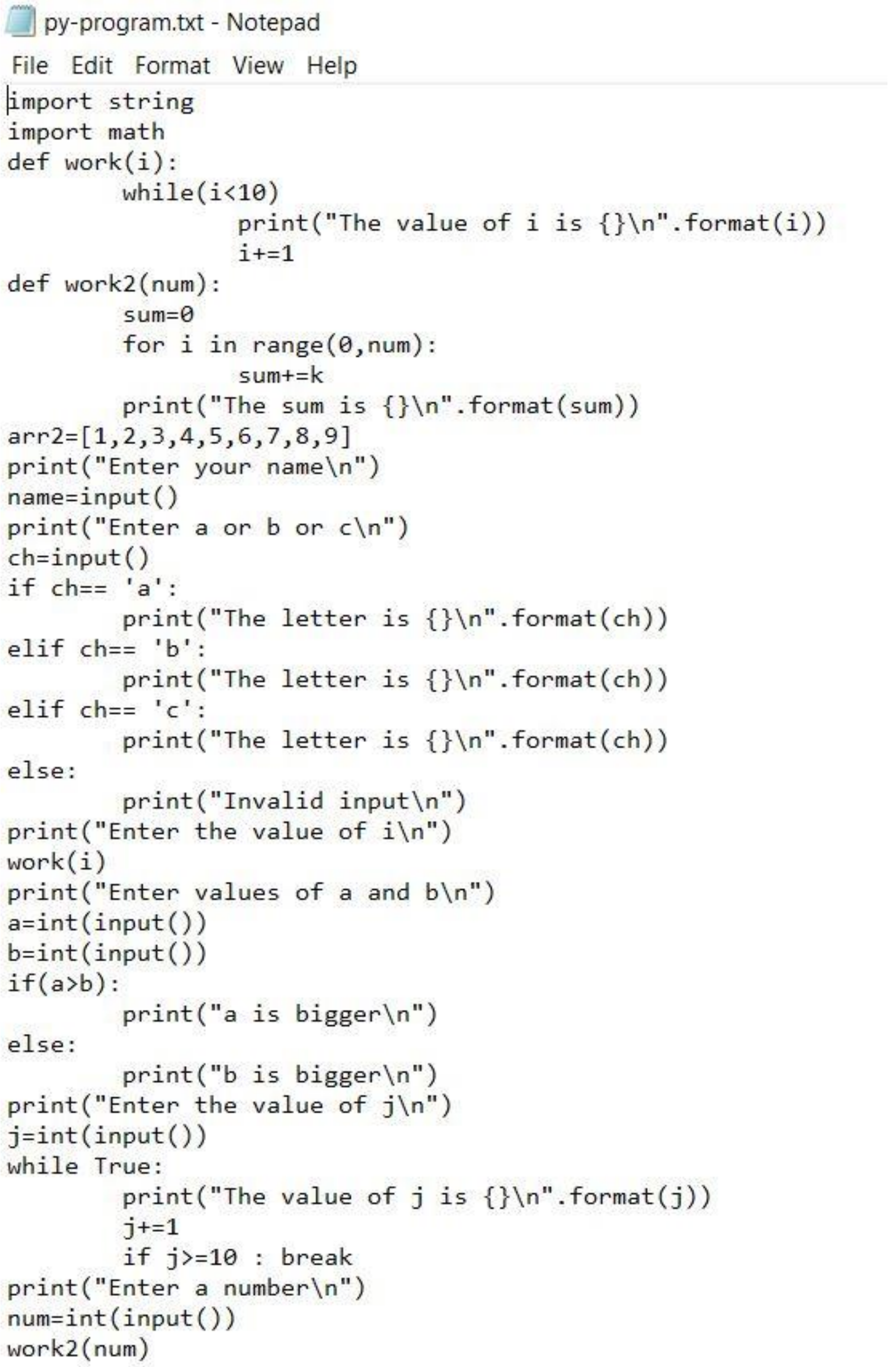


```
}

                The Python Code is

import string
import math
def work(i):
        while(i<10)
                print("The value of i is {}\n".format(i))
                i+=1
def work2(num):
        sum=0
        for i in range(0,num):
                sum+=k
        print("The sum is {}\n".format(sum))
arr2=[1,2,3,4,5,6,7,8,9]
print("Enter your name\n")
name=input()
print("Enter a or b or c\n")
ch=input()
if ch== 'a':
        print("The letter is {}\n".format(ch))
elif ch== 'b':
        print("The letter is {}\n".format(ch))
elif ch== 'c':
        print("The letter is {}\n".format(ch))
else:
        print("Invalid input\n")
print("Enter the value of i\n")
work(i)
print("Enter values of a and b\n")
a=int(input())
b=int(input())
if(a>b):
        print("a is bigger\n")
else:
        print("b is bigger\n")
print("Enter the value of j\n")
j=int(input())
while True:
        print("The value of j is {}\n".format(j))
        j+=1
        if j>=10 : break
print("Enter a number\n")
num=int(input())
work2(num)
```

Fig 4: Program execution (Final Output)



```
import string
import math
def work(i):
        while(i<10)
                print("The value of i is {}\n".format(i))
                i+=1
def work2(num):
        sum=0
        for i in range(0,num):
                sum+=k
        print("The sum is {}\n".format(sum))
arr2=[1,2,3,4,5,6,7,8,9]
print("Enter your name\n")
name=input()
print("Enter a or b or c\n")
ch=input()
if ch== 'a':
        print("The letter is {}\n".format(ch))
elif ch== 'b':
        print("The letter is {}\n".format(ch))
elif ch== 'c':
        print("The letter is {}\n".format(ch))
else:
        print("Invalid input\n")
print("Enter the value of i\n")
work(i)
print("Enter values of a and b\n")
a=int(input())
b=int(input())
if(a>b):
        print("a is bigger\n")
else:
        print("b is bigger\n")
print("Enter the value of j\n")
j=int(input())
while True:
        print("The value of j is {}\n".format(j))
        j+=1
        if j>=10 : break
print("Enter a number\n")
num=int(input())
work2(num)
```

Fig 5: py-program.txt (Output file)