Week 4

Part-1)

// struct.h

```
int pop(int);
int push(int, int, int*);
```

// utils.h

```
#define MAX_SIZE 100
```

// pop.c

```
#include <stdio.h>
#include <stdlib.h>

// pushing elements out of the stack and decrementing
int pop(int top)
{

   // handling underflow
   if (top == -1)
   {
      printf("Error : Stack Underflow");
      return top;
   }

   // incrementing top and assigning new value
   --top;
   return top;
}
```

// push.c

```
#include <stdio.h>
#include <stdlib.h>
#include "utils.h"

// pushing elements into the stack and incrementing
int push(int x, int top, int A[])
{

   // handling overflow
   if (top == MAX_SIZE - 1)
   {
      printf("Error : Stack Overflow");
      return top;
   }

   // incrementing top and assigning new value
   A[++top] = x;
   return top;
}
```

```
// main.c

#include <stdio.h>
#include <stdlib.h>
#include "struct.h"
#include "utils.h"

// defining global variables
int A[MAX_SIZE];
int top = -1;


// getting value of element at the top
int getTop()
{
   return A[top];
}

// printitng Stack
void printStack()
{

   // instatiating variables
   int i;

   // error condition
   if (top == -1)
   {
      printf("The Stack is empty");
      return;
   }

   printf("Stack : [  ");
   // looping through and printitng
   for (i = 0; i <= top; i++)
   {
      printf("%d  ", A[i]);
   }
   printf("]\n");
   return;
}

// driver function
int main()
{
   printf("Stack Code\n\n");

   top = push(2, top, A);
   printStack();

   top = push(5, top, A);
   printStack();

   top = push(10, top, A);
   printStack();

   top = pop(top);
   printStack();

   top = push(12, top, A);
   printStack();
```

```
    return 0;
}
```

```
student@project-lab:~/Documents/OST 190905494 - Angad Sandhu/Week 4$ gcc -o main main.o push.o pop.o
student@project-lab:~/Documents/OST 190905494 - Angad Sandhu/Week 4$ ./main
Stack Code

Stack : [  2  ]
Stack : [  2  5  ]
Stack : [  2  5  10  ]
Stack : [  2  5  ]
Stack : [  2  5  12  ]
student@project-lab:~/Documents/OST 190905494 - Angad Sandhu/Week 4$
```

Part-2)

```
# Makefile

myapp: main.o pop.o push.o
	gcc -o myapp main.o pop.o push.o

main.o: main.c struct.h utils.h
	gcc -c main.c

pop.o: pop.c
	gcc -c pop.c

push.o: push.c utils.h
	gcc -c push.c
```

```
student@project-lab: ~/Documents/OST 190905494 - Angad Sandhu/Week 4
File  Edit  View  Search  Terminal  Help
student@project-lab:~/Documents/OST 190905494 - Angad Sandhu/Week 4$ make -f Makefile
gcc -c main.c
gcc -c pop.c
gcc -c push.c
gcc -o myapp main.o pop.o push.o
student@project-lab:~/Documents/OST 190905494 - Angad Sandhu/Week 4$ rm pop.o
student@project-lab:~/Documents/OST 190905494 - Angad Sandhu/Week 4$ make -f Makefile
gcc -c pop.c
gcc -o myapp main.o pop.o push.o
student@project-lab:~/Documents/OST 190905494 - Angad Sandhu/Week 4$ ls
main.c  main.o  Makefile  myapp  pop.c  pop.o  push.c  push.o  stack.c  struct.h  utils.h
student@project-lab:~/Documents/OST 190905494 - Angad Sandhu/Week 4$
```