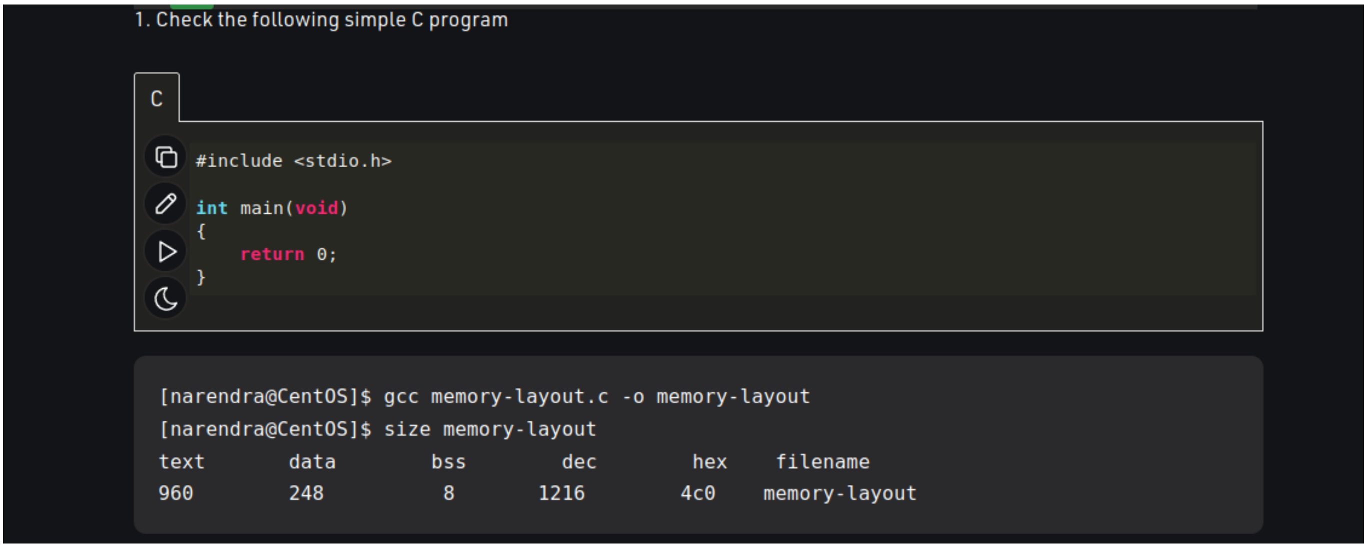
# Memory structure

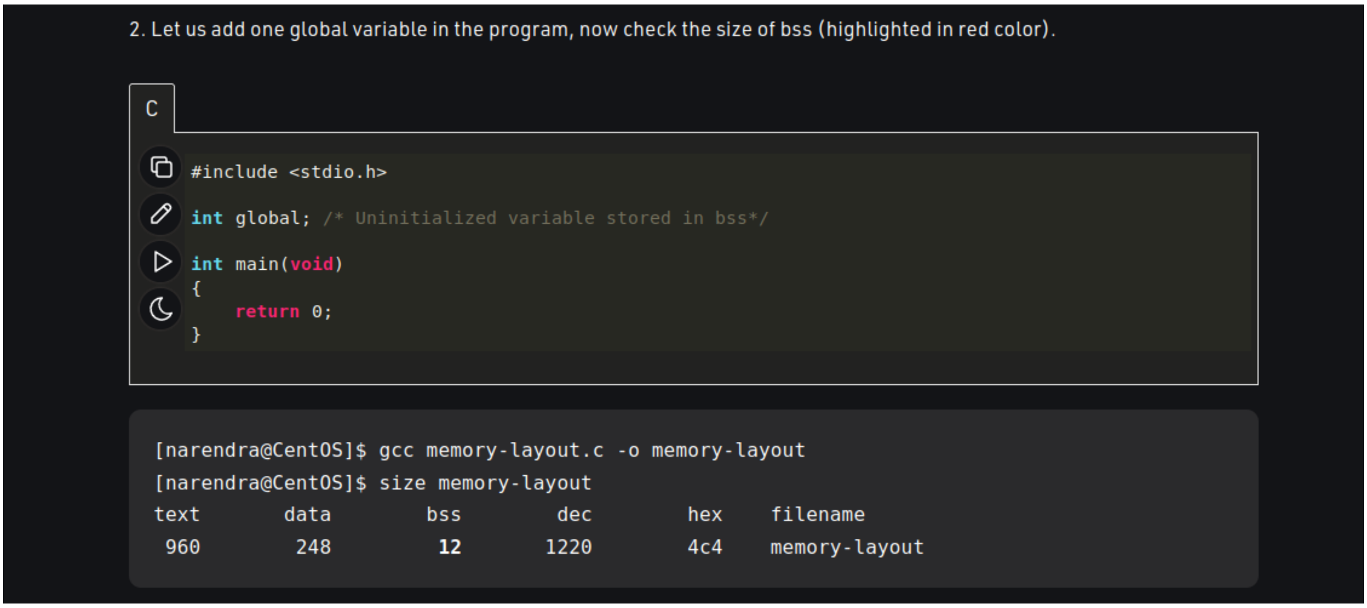


1. Check the following simple C program

```c
#include <stdio.h>

int main(void)
{
    return 0;
}
```

```
[narendra@CentOS]$ gcc memory-layout.c -o memory-layout
[narendra@CentOS]$ size memory-layout
text        data        bss         dec         hex     filename
960         248          8         1216         4c0    memory-layout
```



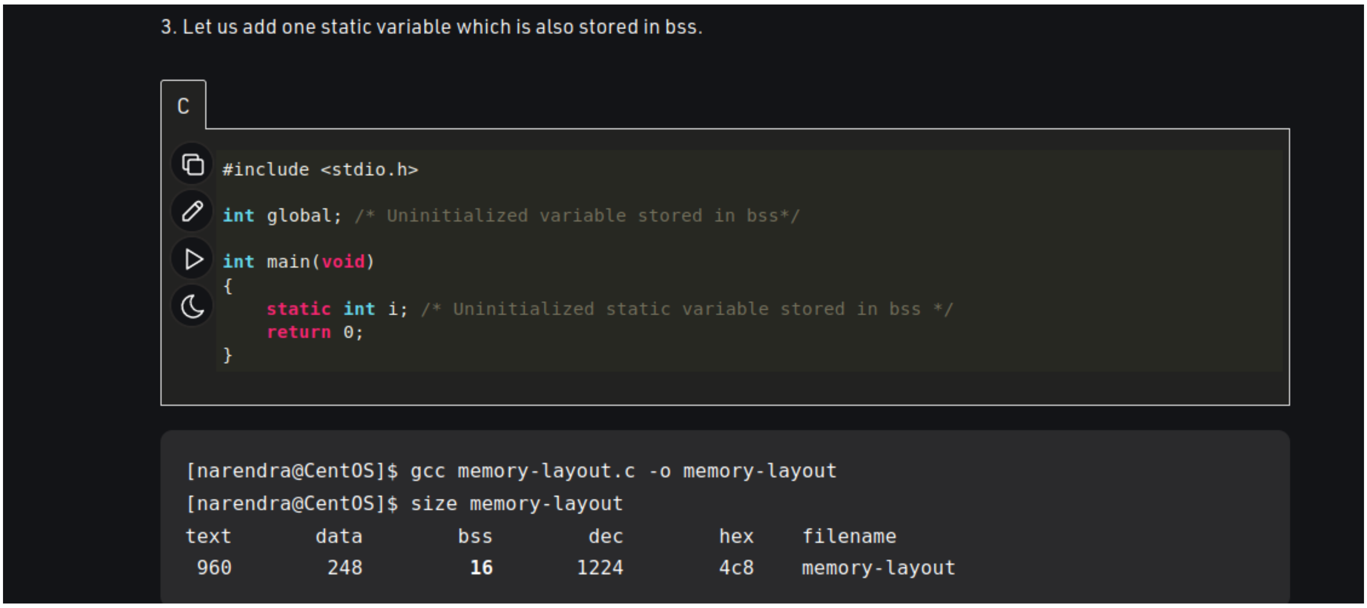
2. Let us add one global variable in the program, now check the size of bss (highlighted in red color).

```c
#include <stdio.h>

int global; /* Uninitialized variable stored in bss*/

int main(void)
{
    return 0;
}
```

```
[narendra@CentOS]$ gcc memory-layout.c -o memory-layout
[narendra@CentOS]$ size memory-layout
text        data        bss         dec         hex     filename
 960         248         12        1220         4c4     memory-layout
```



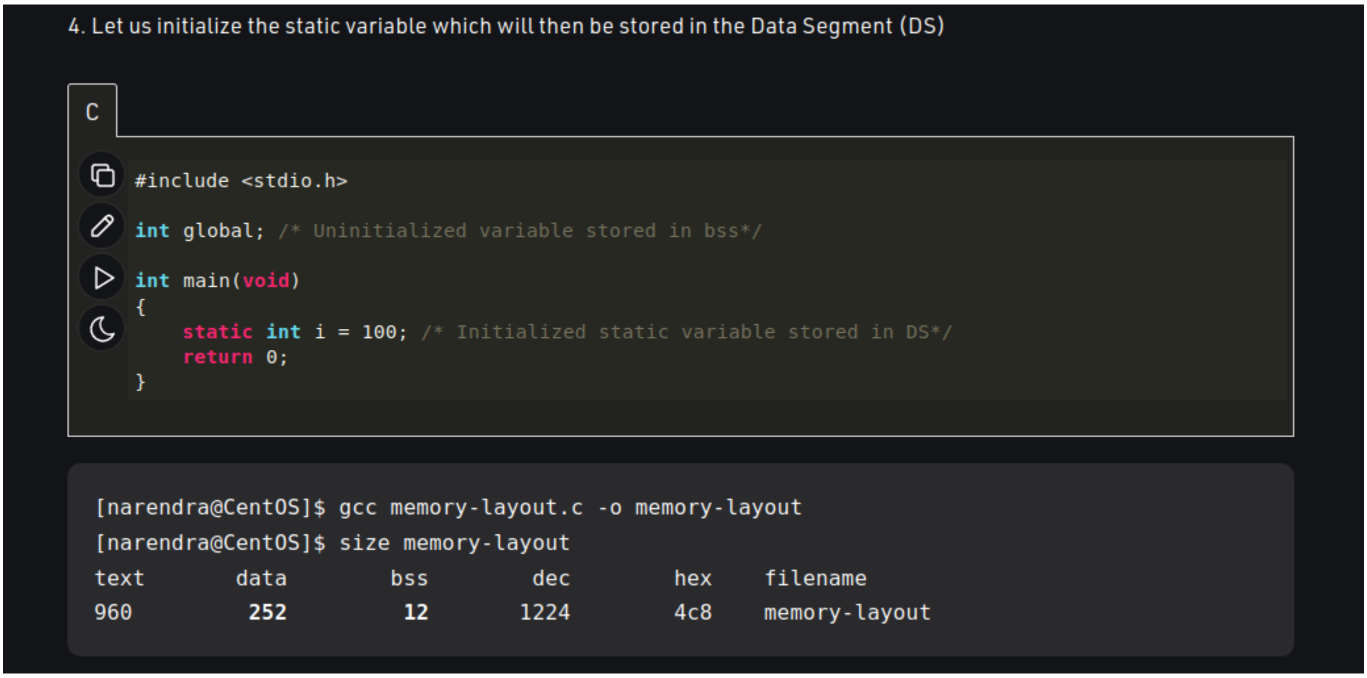
3. Let us add one static variable which is also stored in bss.

```c
#include <stdio.h>

int global; /* Uninitialized variable stored in bss*/

int main(void)
{
    static int i; /* Uninitialized static variable stored in bss */
    return 0;
}
```

```
[narendra@CentOS]$ gcc memory-layout.c -o memory-layout
[narendra@CentOS]$ size memory-layout
text        data        bss         dec         hex     filename
 960         248         16        1224         4c8     memory-layout
```



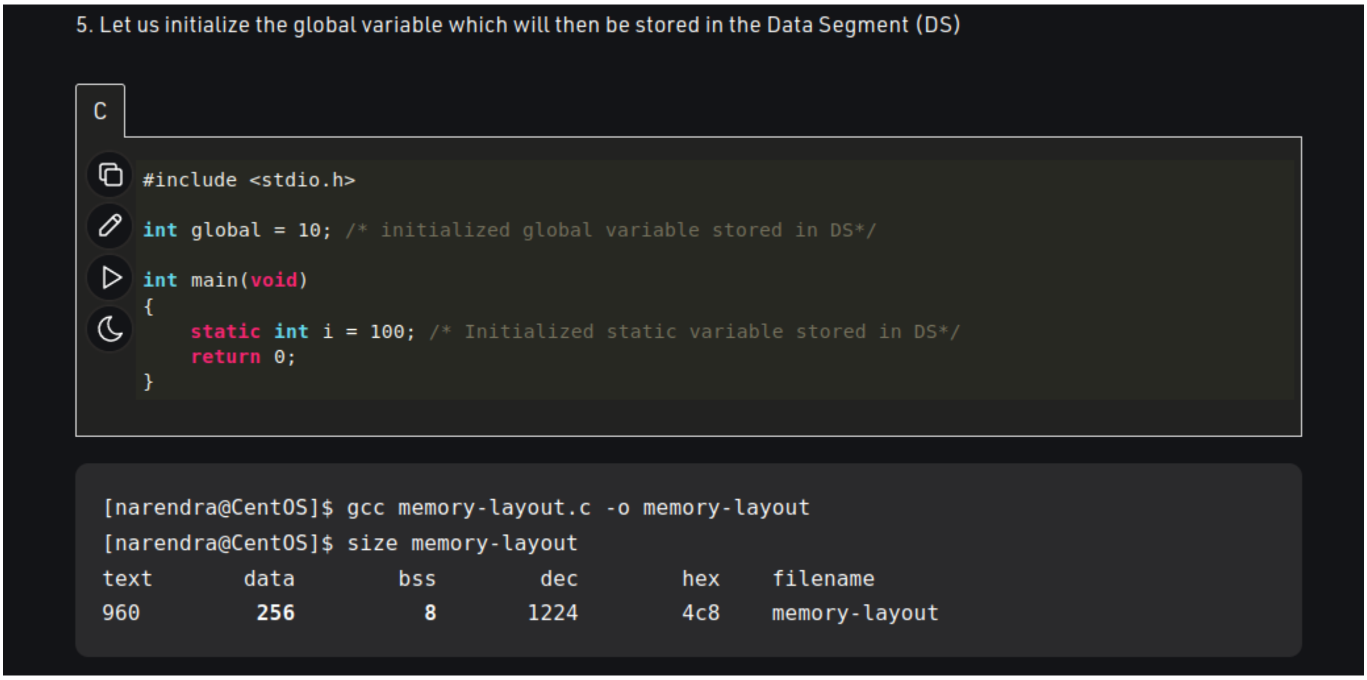
4. Let us initialize the static variable which will then be stored in the Data Segment (DS)

```c
#include <stdio.h>

int global; /* Uninitialized variable stored in bss*/

int main(void)
{
    static int i = 100; /* Initialized static variable stored in DS*/
    return 0;
}
```

```
[narendra@CentOS]$ gcc memory-layout.c -o memory-layout
[narendra@CentOS]$ size memory-layout
text       data        bss        dec        hex     filename
960         252         12        1224        4c8     memory-layout
```



5. Let us initialize the global variable which will then be stored in the Data Segment (DS)

```c
#include <stdio.h>

int global = 10; /* initialized global variable stored in DS*/

int main(void)
{
    static int i = 100; /* Initialized static variable stored in DS*/
    return 0;
}
```

```
[narendra@CentOS]$ gcc memory-layout.c -o memory-layout
[narendra@CentOS]$ size memory-layout
text       data        bss        dec        hex     filename
960         256          8        1224        4c8     memory-layout
```