[Pre-Requisite Workshop-1]

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Section : L5CG7

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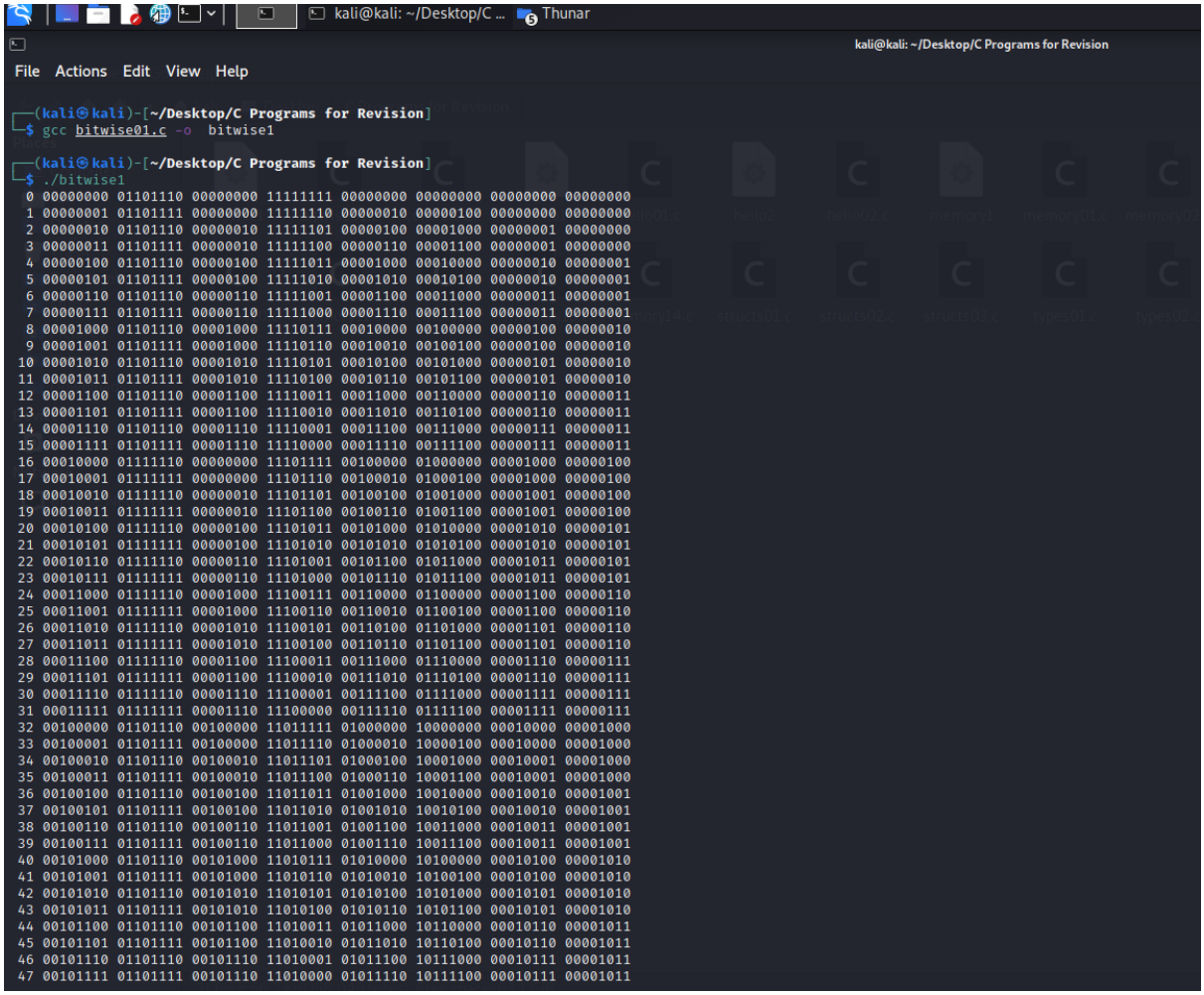
1. bitwise01

```
#include <stdio.h>
 void toBinary(unsigned char c, unsigned char *result) {
 unsigned char i;
 unsigned char mask = 128;

for(i=0;i<8;i++){
  if(mask & c) {
    result[i]='1';
  } else {
    result[i]='0';
  }
  mask = mask >> 1;
 }
 result[8]=0;
}
int main() {
 char result1[9];
 char result2[9];
 char result3[9];
 char result4[9];
 char result5[9];
 char result6[9];
 char result7[9];
 char result8[9];

 unsigned char n;
 unsigned char mask = 110;
 unsigned char or;
 unsigned char and;
```

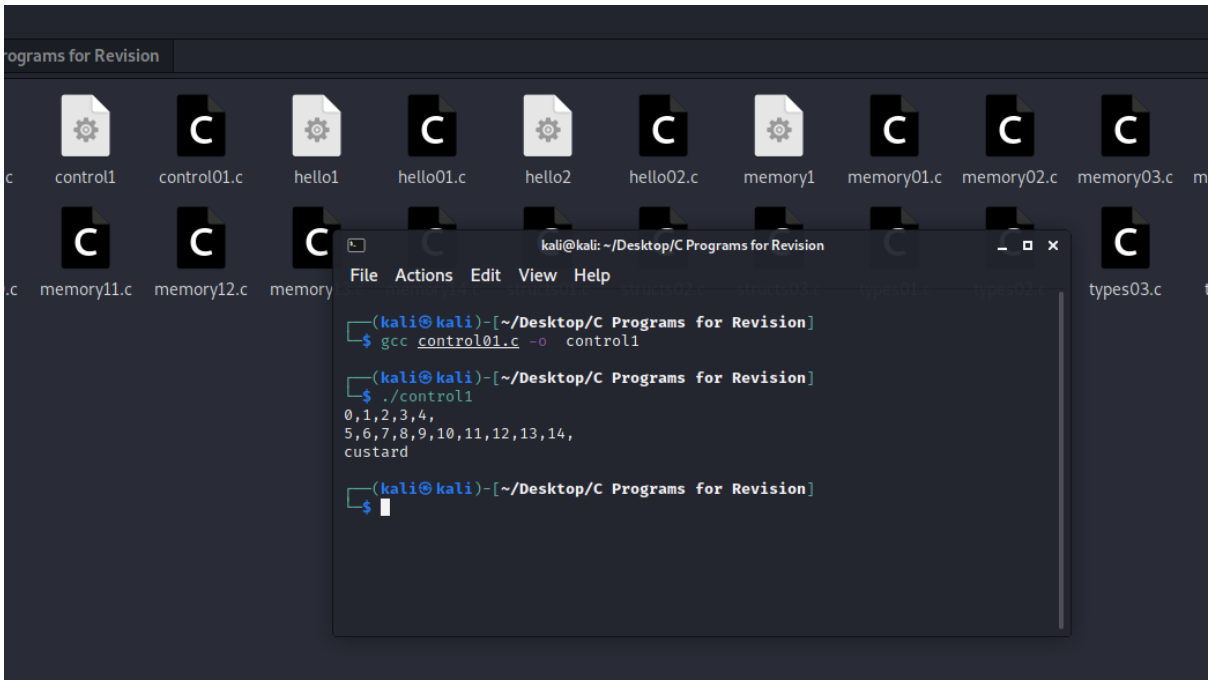
```
  unsigned char not;
  unsigned char leftOnce;
  unsigned char leftTwice;
  unsigned char rightOnce;
  unsigned char rightTwice;
  int i;

  for(i=0;i<256;i++){
    n = i;
    or = n | mask;
    and = n & mask;
    not = ~n;
    leftOnce = n << 1;
    leftTwice = n << 2;
    rightOnce = n >> 1;
    rightTwice = n >> 2;
    toBinary(n, result1);
    toBinary(or, result2);
    toBinary(and, result3);
    toBinary(not, result4);
    toBinary(leftOnce, result5);
    toBinary(leftTwice, result6);
    toBinary(rightOnce, result7);
    toBinary(rightTwice, result8);
    printf("%3hu %s %s %s %s %s %s %s %s\n",
      n, result1, result2, result3, result4,
      result5, result6, result7, result8);
    n++;
  }
}
```



2. control01

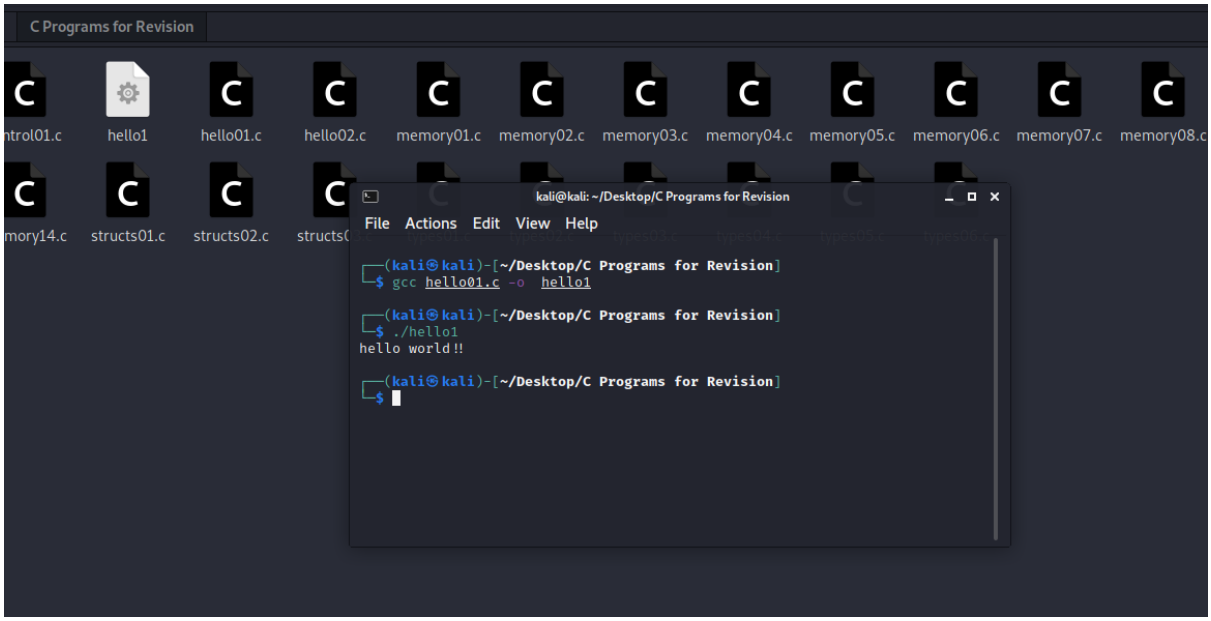
```
#include <stdlib.h>
#include <stdio.h>

int main() {
  int i;
  for(i=0;i<5;i++){
    printf("%d,", i);
  }
  printf("\n");

  while(i<10){
    printf("%d,", i);
    i++;
  }
```

```
  do {
    printf("%d,", i);
    i++;
  } while(i<15);
  printf("\n");

  if(i>13){
    printf("custard\n");
  } else {
    printf("gravy\n");
  }

  return EXIT_SUCCESS;
}
```



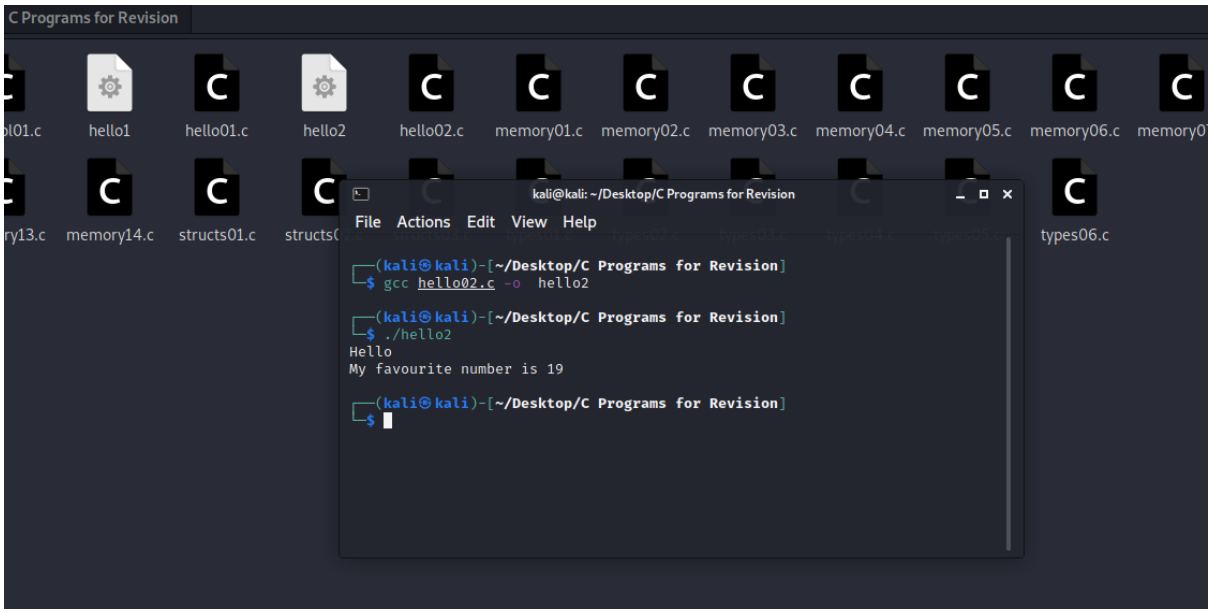
3. hello01

```
#include <stdio.h>

int main(){
  printf("hello world!!\n");
  return 0;
}
```



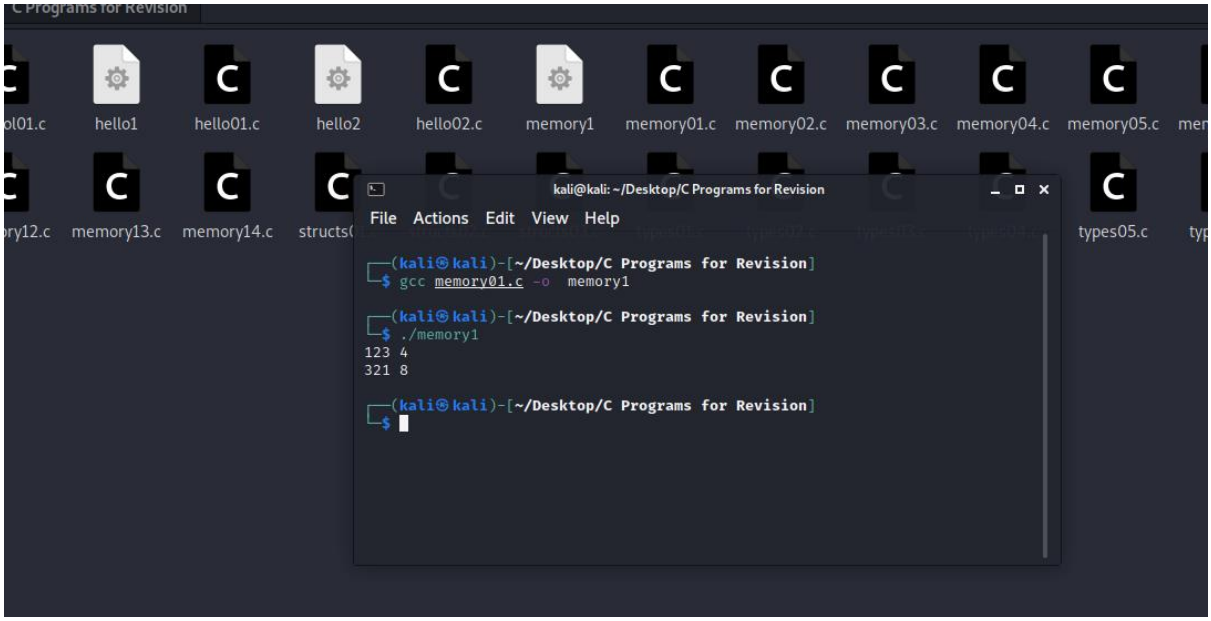
4. hello02

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

int main() {
  int n = 19;
  printf("Hello\nMy favourite number is %d\n", n);
  return EXIT_SUCCESS;
}
```



5. memory01

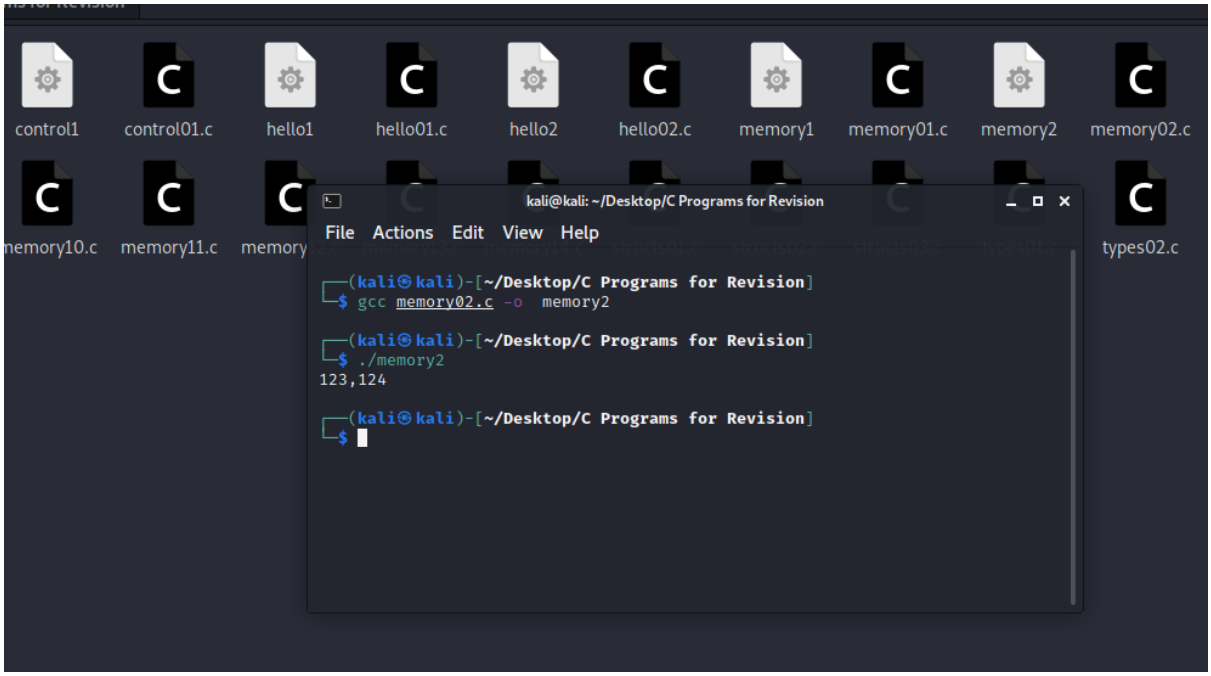
```
#include <stdio.h>
#include <stdlib.h>

int main() {
  int x = 123;
  long int y = 321;
  printf("%d %ld\n",  x, sizeof(x));
  printf("%ld %ld\n", y, sizeof(y));
  return EXIT_SUCCESS;
}
```



6. memory02

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

int inc(int w) {
  return w + 1;
}
int main() {
```

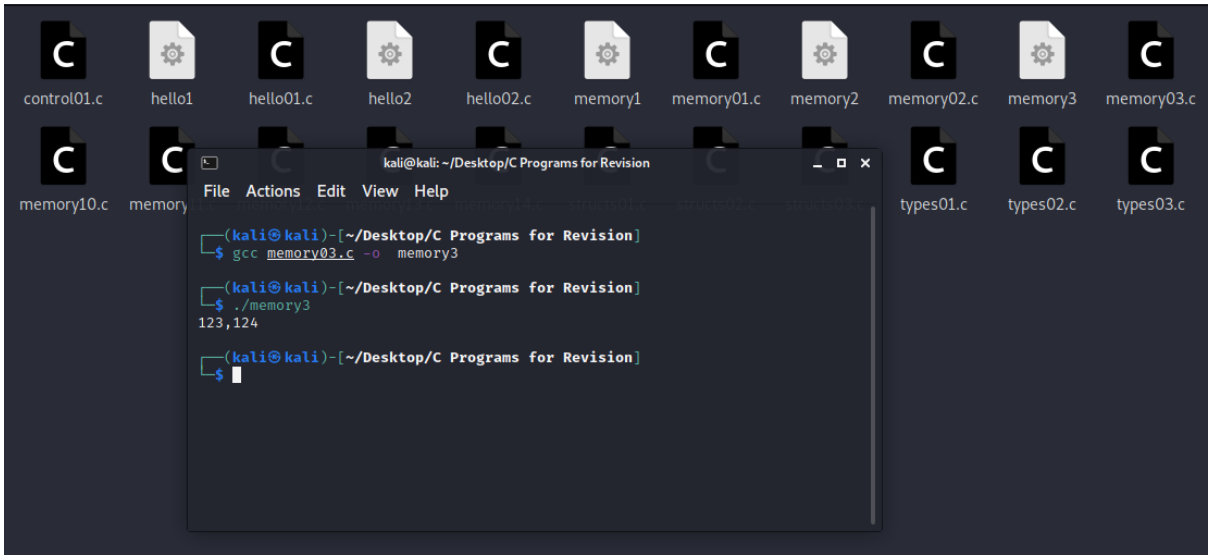
```
    int x = 123;
    int y = inc(x);
    printf("%d,%d\n", x, y);
    return EXIT_SUCCESS;
}
```



7. memory03

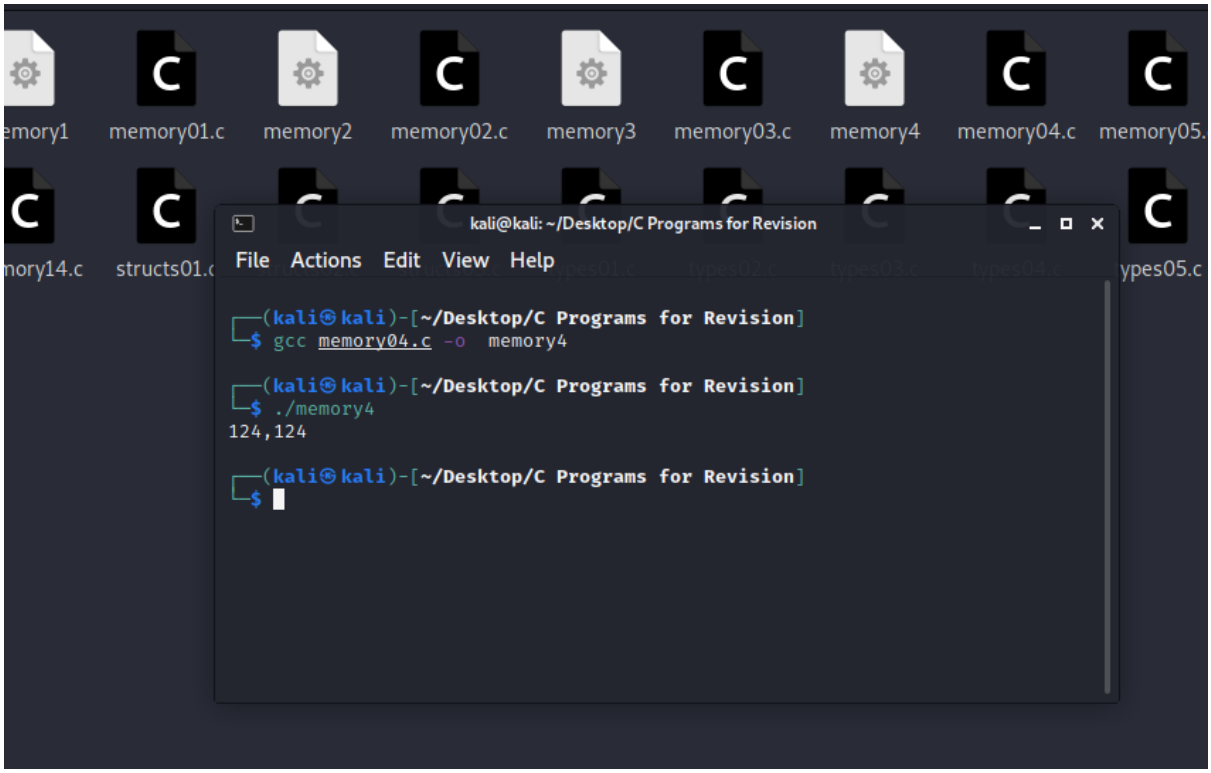
```
#include <stdio.h>
#include <stdlib.h>

void inc(int *w) {
  *w = *w + 1;
}
int main() {
  int x = 123;
  int y = x;
  inc(&y);
  printf("%d,%d\n", x, y);
  return EXIT_SUCCESS;
```

}



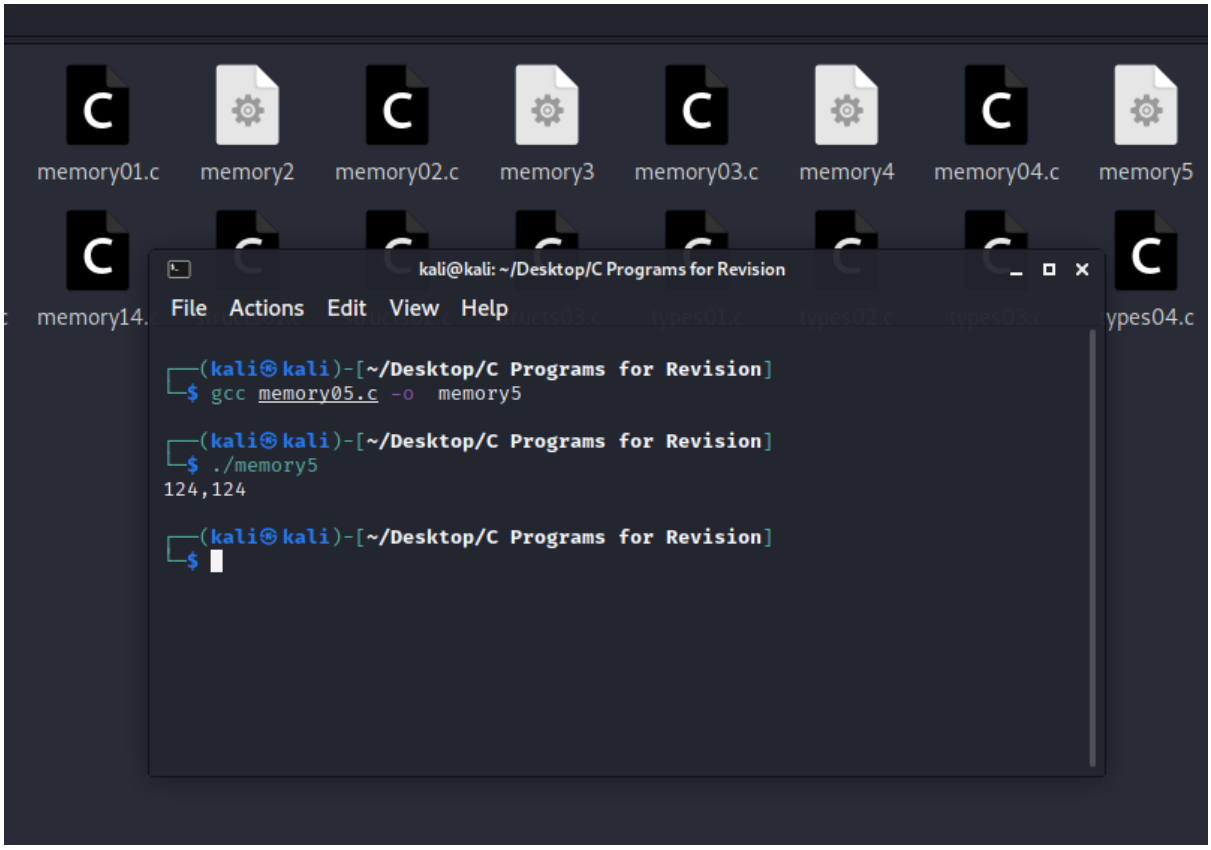
8. memory04

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

void inc(int *w) {
  *w = *w + 1;
}

int main() {
  int x = 123;
  int *y;
  y = &x;
  inc(y);
  printf("%d,%d\n", x, *y);
  return EXIT_SUCCESS;
}
```



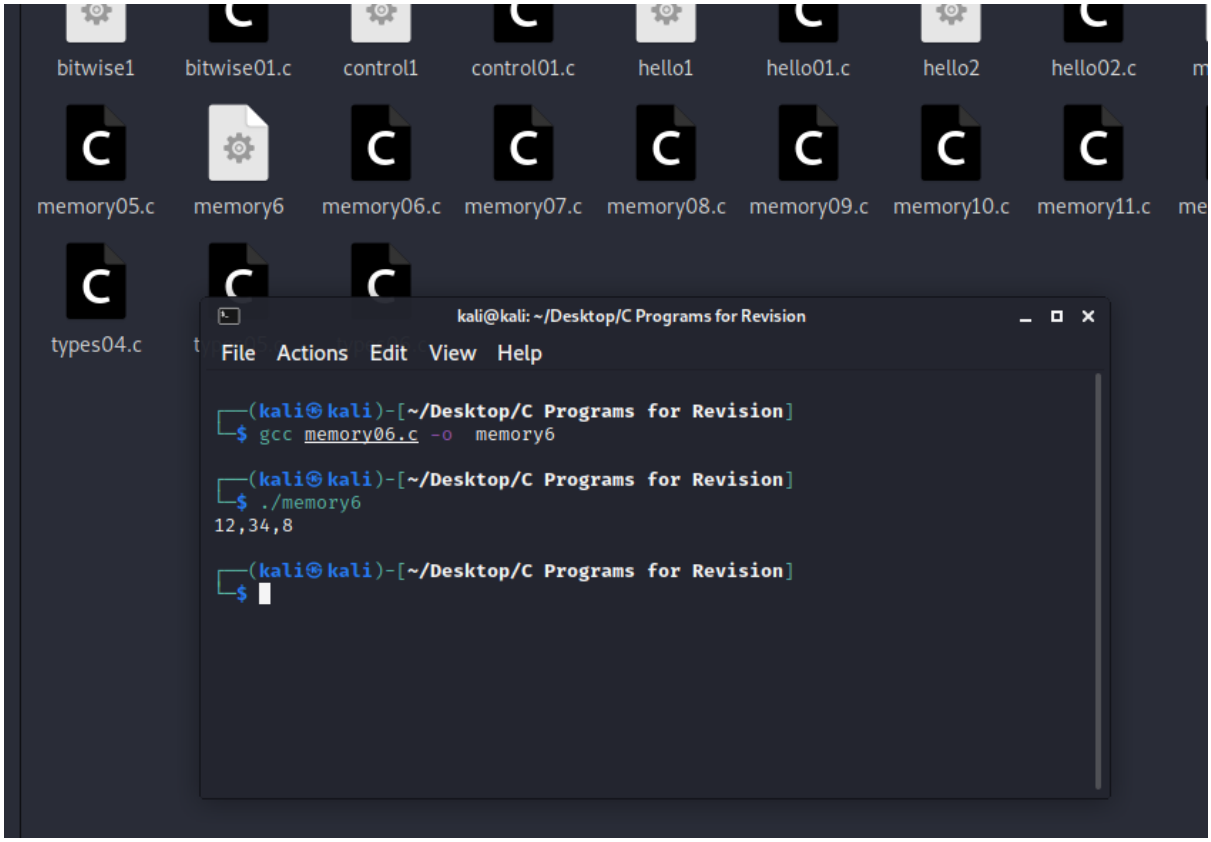
9. memory05

```
#include <stdio.h>
#include <stdlib.h>
#include <malloc.h>
void inc(int *w) {
  *w = *w + 1;
}
int main() {
  int *x = malloc(sizeof(int));
  *x = 123;
  int *y;
  y = x;
  inc(y);
  printf("%d,%d\n", *x, *y);
  free(x);
  return EXIT_SUCCESS;
}
```



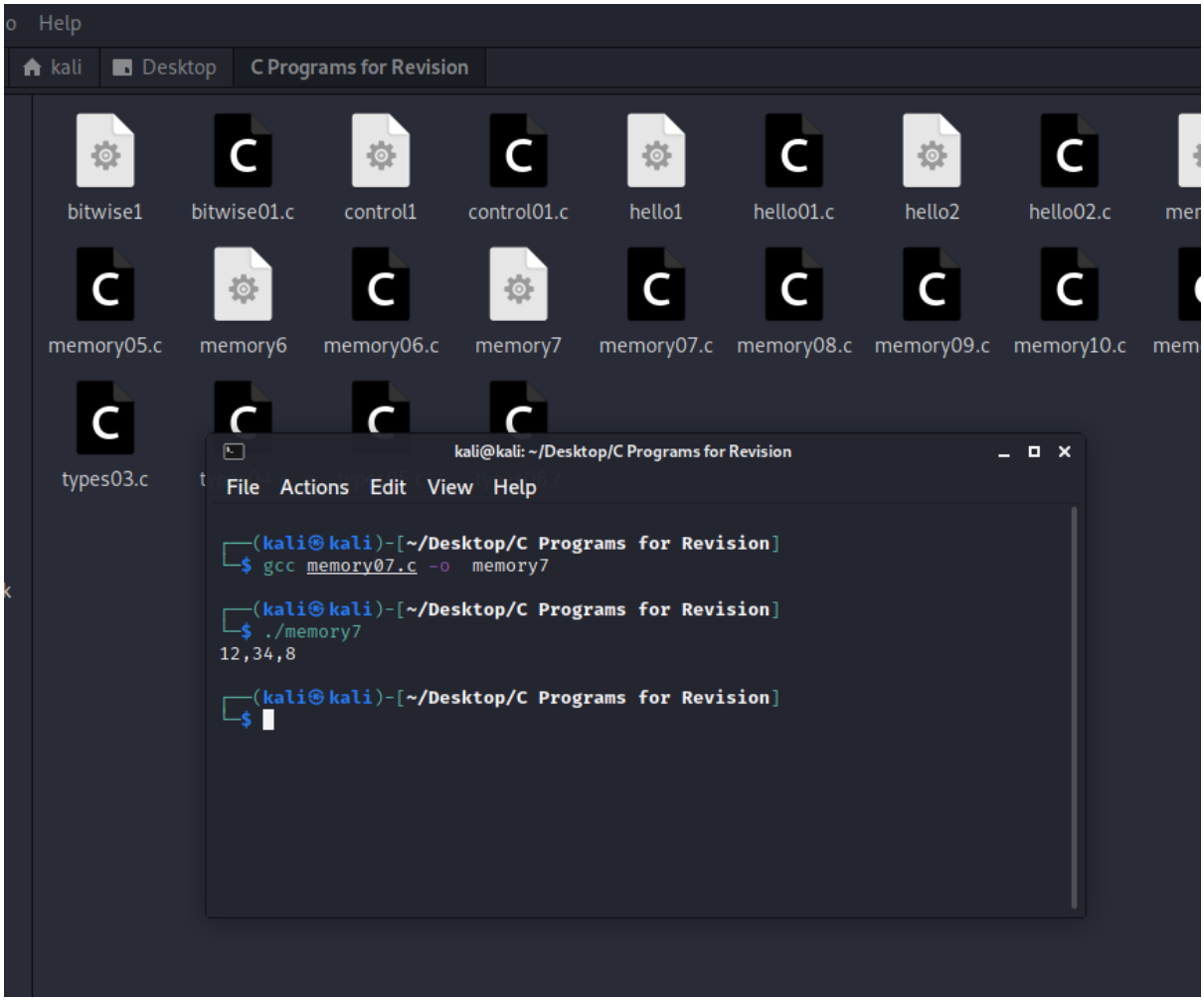
10. memory06

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

struct pair {
  int a;
  int b;
};

int main() {
  struct pair x;
  x.a = 12;
  x.b = 34;
  printf("%d,%d,%ld\n", x.a, x.b, sizeof(struct pair));
  return EXIT_SUCCESS;
}
```



11. memory07

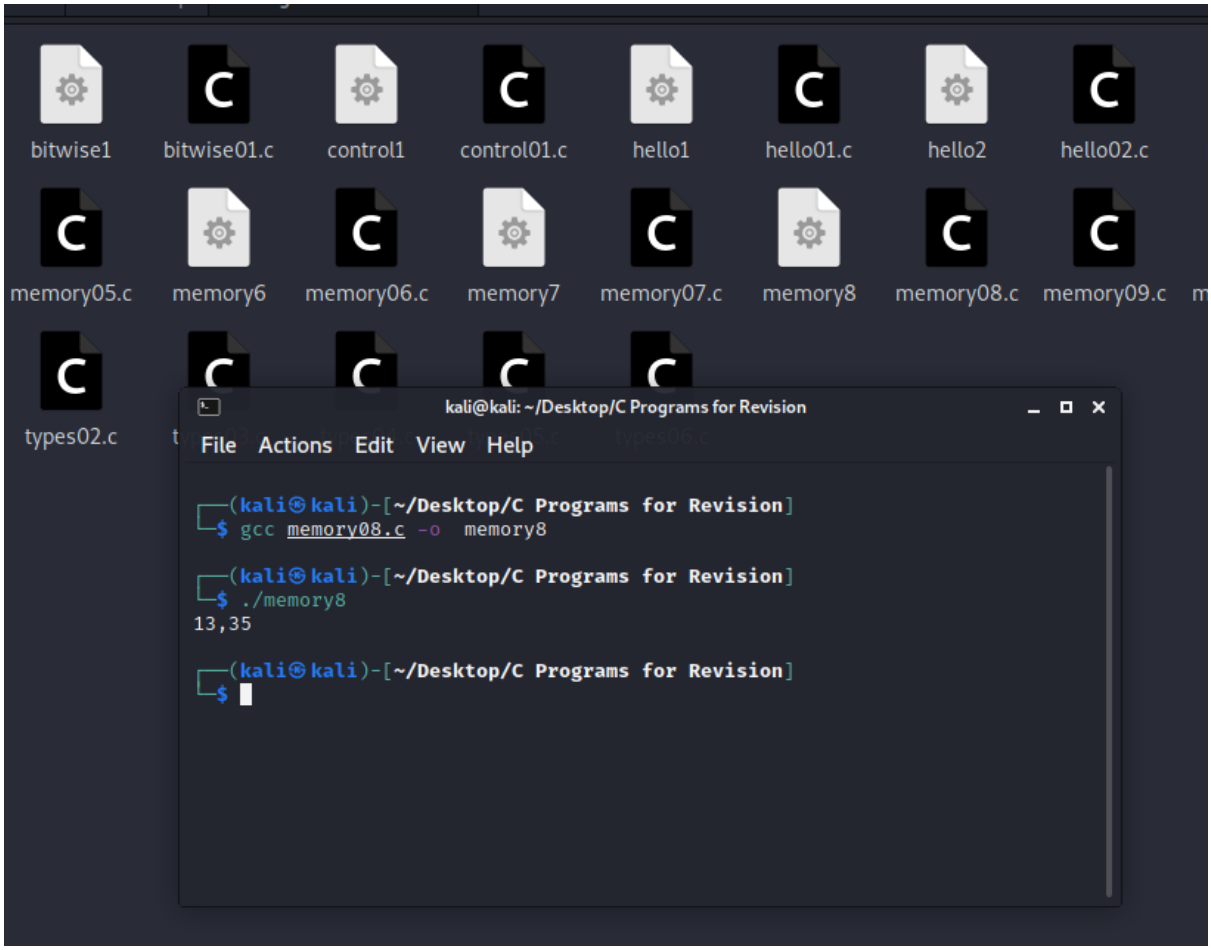
```
#include <stdio.h>
#include <stdlib.h>
typedef struct  {
  int a;
  int b;
} pair;

int main() {
  pair x;
  x.a = 12;
  x.b = 34;
  printf("%d,%d,%ld\n", x.a, x.b, sizeof(pair));
  return EXIT_SUCCESS;
}
```



12. memory08

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

typedef struct {
  int a;
  int b;
} pair;

void inc(pair *w) {
  w->a = w->a + 1;
  w->b = w->b + 1;
}
```

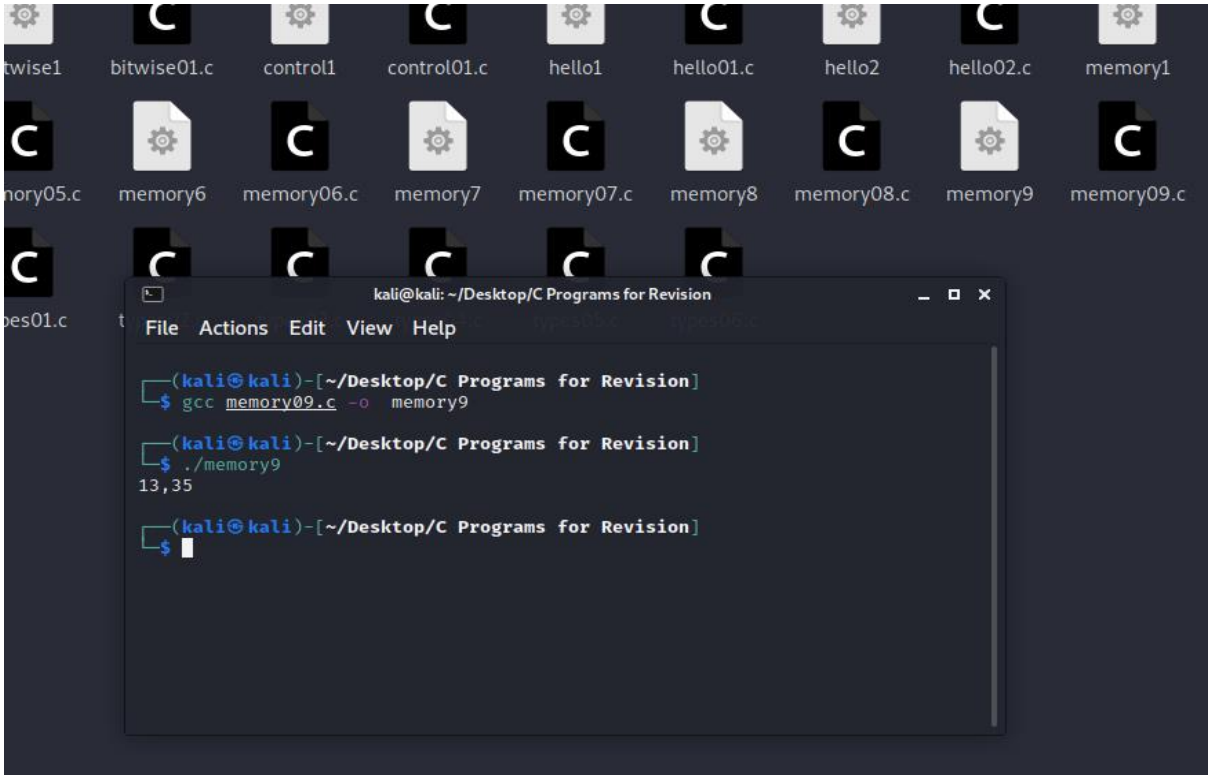
```
int main() {
  pair x;
  x.a = 12;
  x.b = 34;
  inc(&x);
  printf("%d,%d\n", x.a, x.b);
  return EXIT_SUCCESS;
}
```



13. memory09

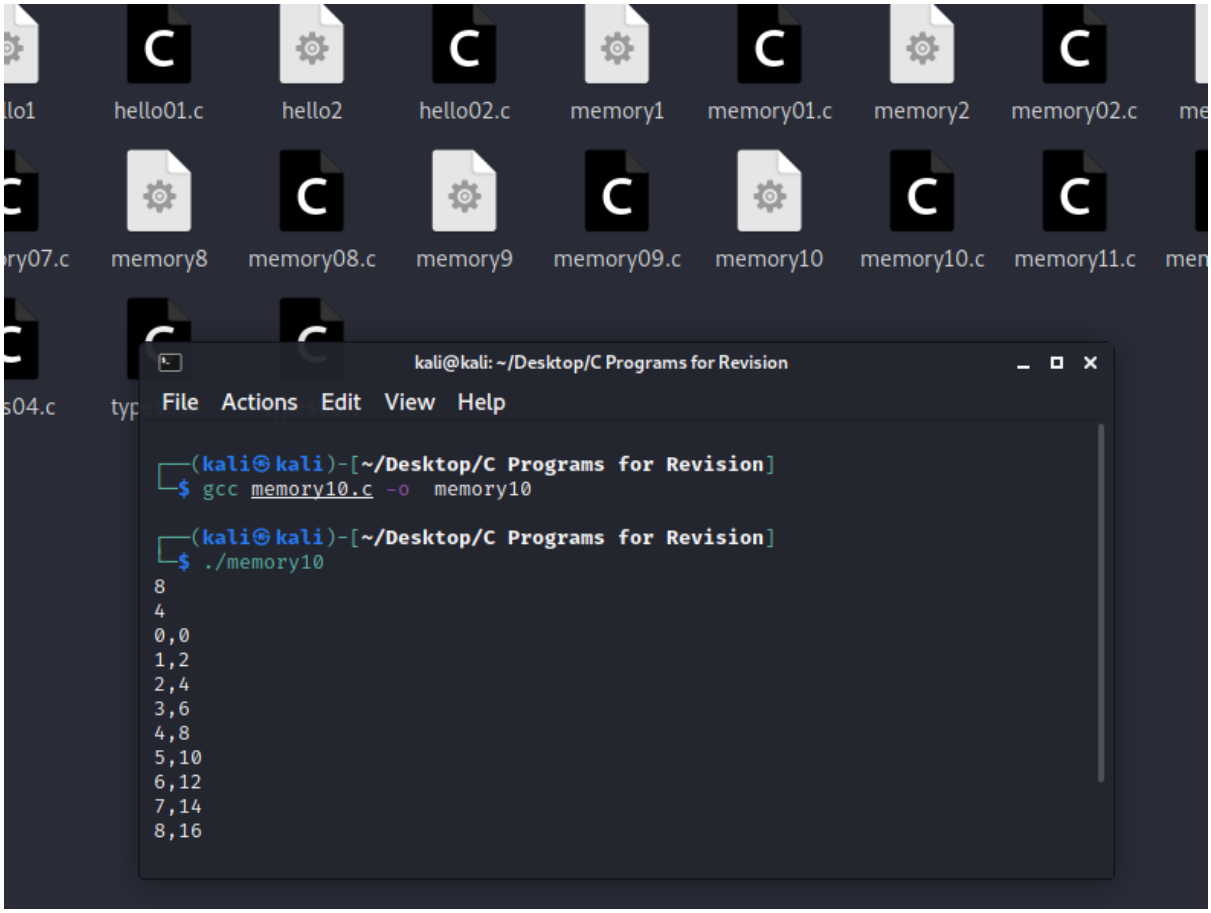
```
#include <stdio.h>
#include <stdlib.h>
#include <malloc.h>

typedef struct {
  int a;
```

```
  int b;
} pair;

void inc(pair *w) {
  w->a = w->a + 1;
  w->b = w->b + 1;
}
int main() {
  pair *x;
  x = malloc(sizeof(pair));
  x->a = 12;
  x->b = 34;
  inc(x);
  printf("%d,%d\n", x->a, x->b);
  free(x);
  return EXIT_SUCCESS;
}
```



14. memory10

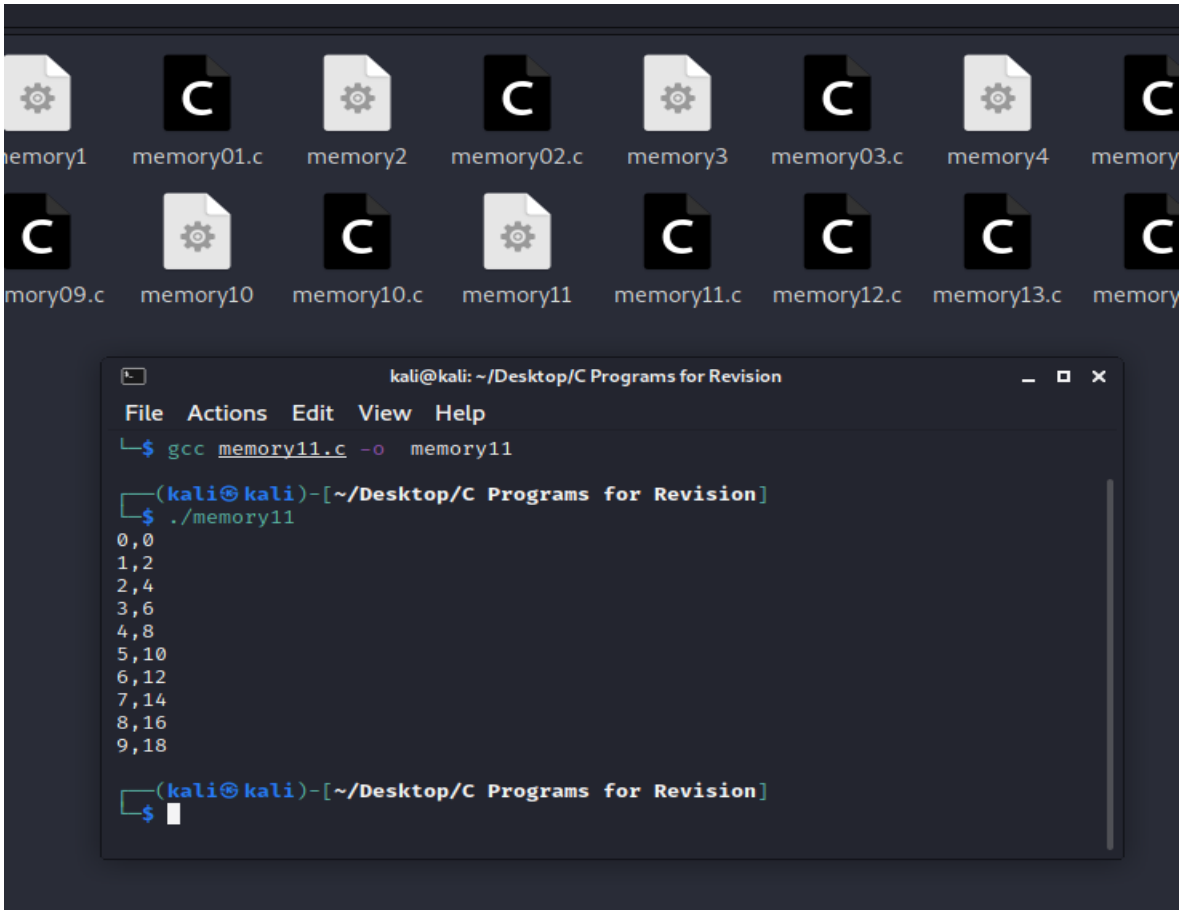
```
#include <stdio.h>
#include <stdlib.h>
#include <malloc.h>

int n = 10;

int main() {
  int i;
  int *x;
  x = malloc(sizeof(int) * n);

  printf("%ld\n", sizeof(x));
  printf("%ld\n", sizeof(*x));

  for(i=0;i<n;i++){
    x[i] = 2 * i;
  }

  for(i=0;i<n;i++){
    printf("%d,%d\n", i, x[i]);
  }

  free(x);
  return EXIT_SUCCESS;
}
```



15. memory11

```
#include <stdio.h>
#include <stdlib.h>
#include <malloc.h>
int n = 10;

int main() {
  int i;
  int *x, *y;
  x = malloc(sizeof(int) * n);
  y = x;

  for(i=0;i<n;i++){
    *y = 2 * i;
    y++;
```

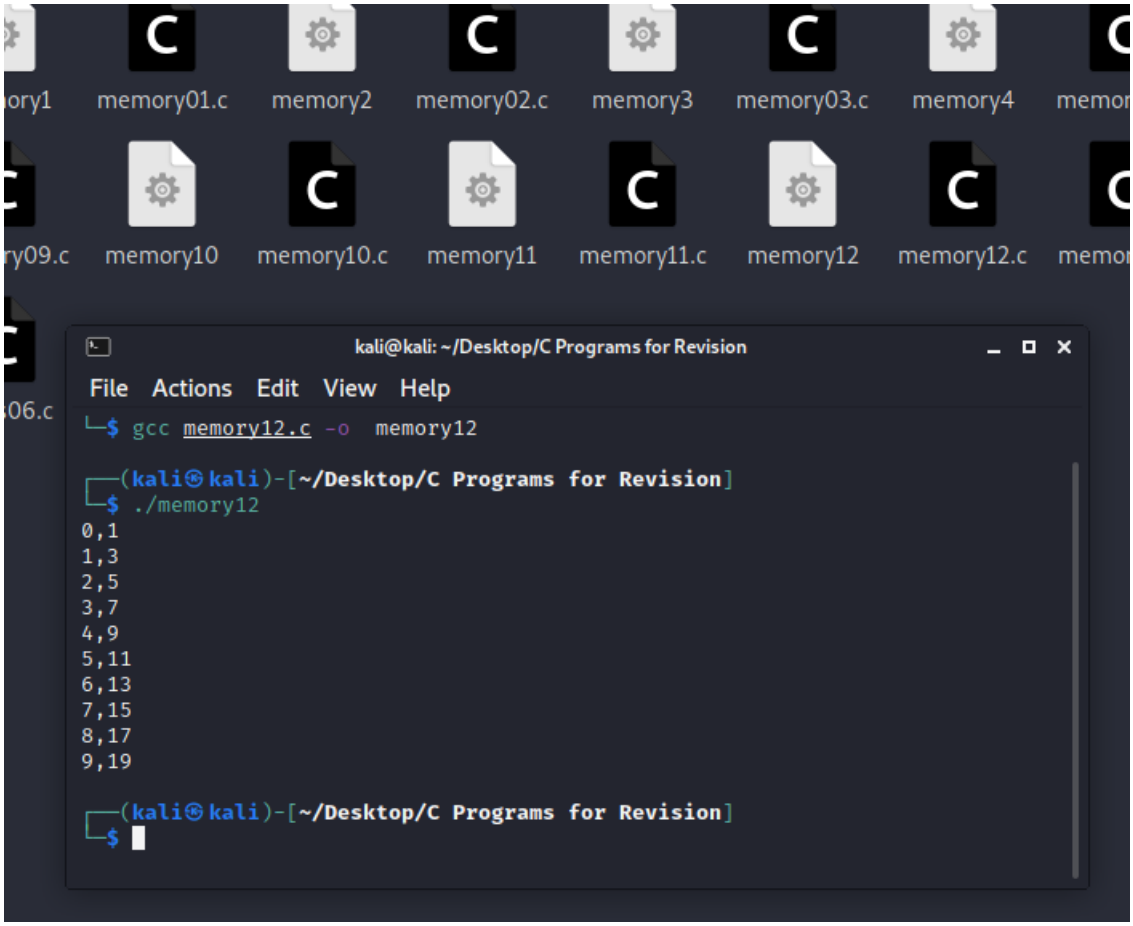
```
  }

  y = x;

  for(i=0;i<n;i++){
    printf("%d,%d\n", i, *y);
    y++;
  }

  free(x);
  return EXIT_SUCCESS;
}
```



16. memory12

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

int n = 10;

void inc(int *w) {
  int i;
  for(i=0;i<n;i++){
    w[i] = w[i] + 1;
  }
}

int main() {
  int i;
  int *x, *y;
  x = malloc(sizeof(int) * n);
  y = x;

  for(i=0;i<n;i++){
    *y = 2 * i;
    y++;
  }

  inc(x);
  y = x;

  for(i=0;i<n;i++){
    printf("%d,%d\n", i, *y);
```

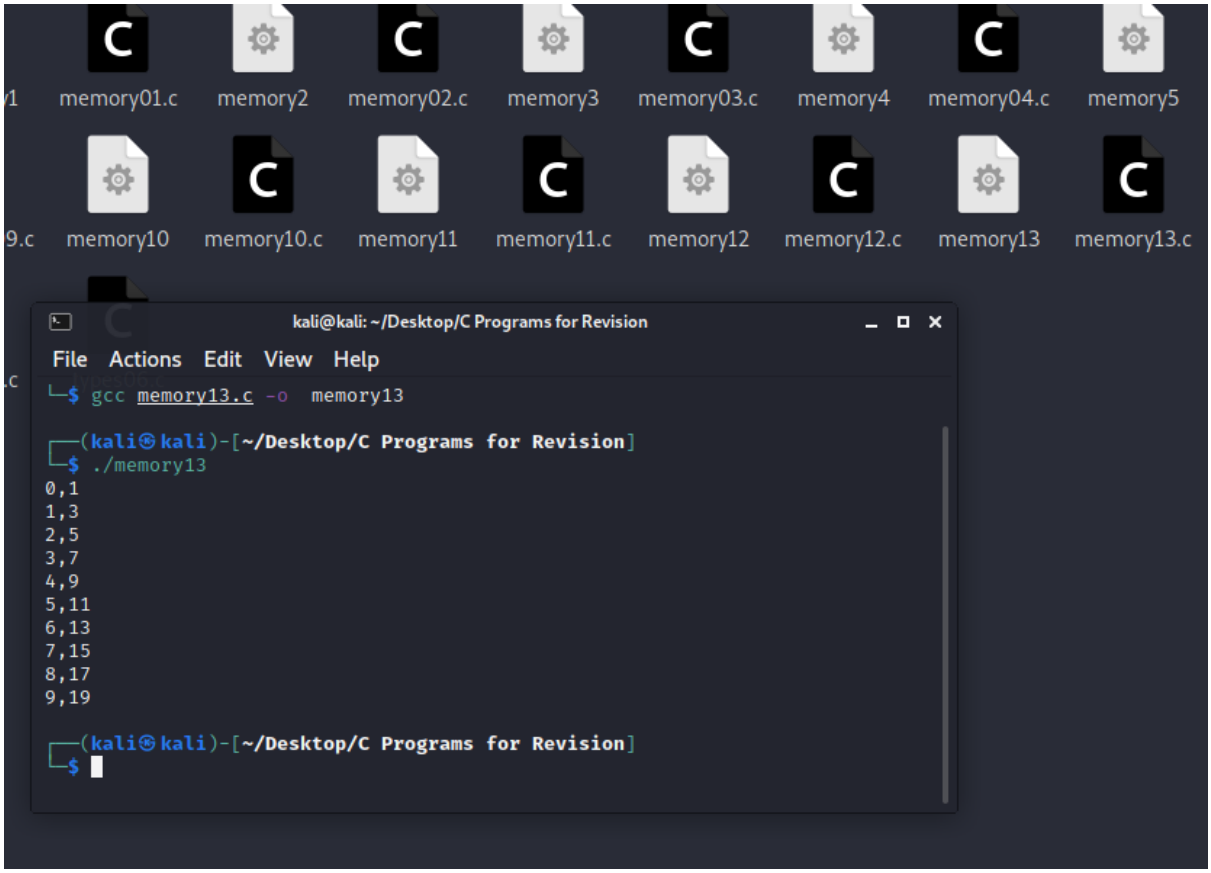
```
    y++;
  }
  free(x);
  return EXIT_SUCCESS;
}
```



17. memory13

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

int n = 10;

void inc(int *w) {
  int i;
  for(i=0;i<n;i++){
```

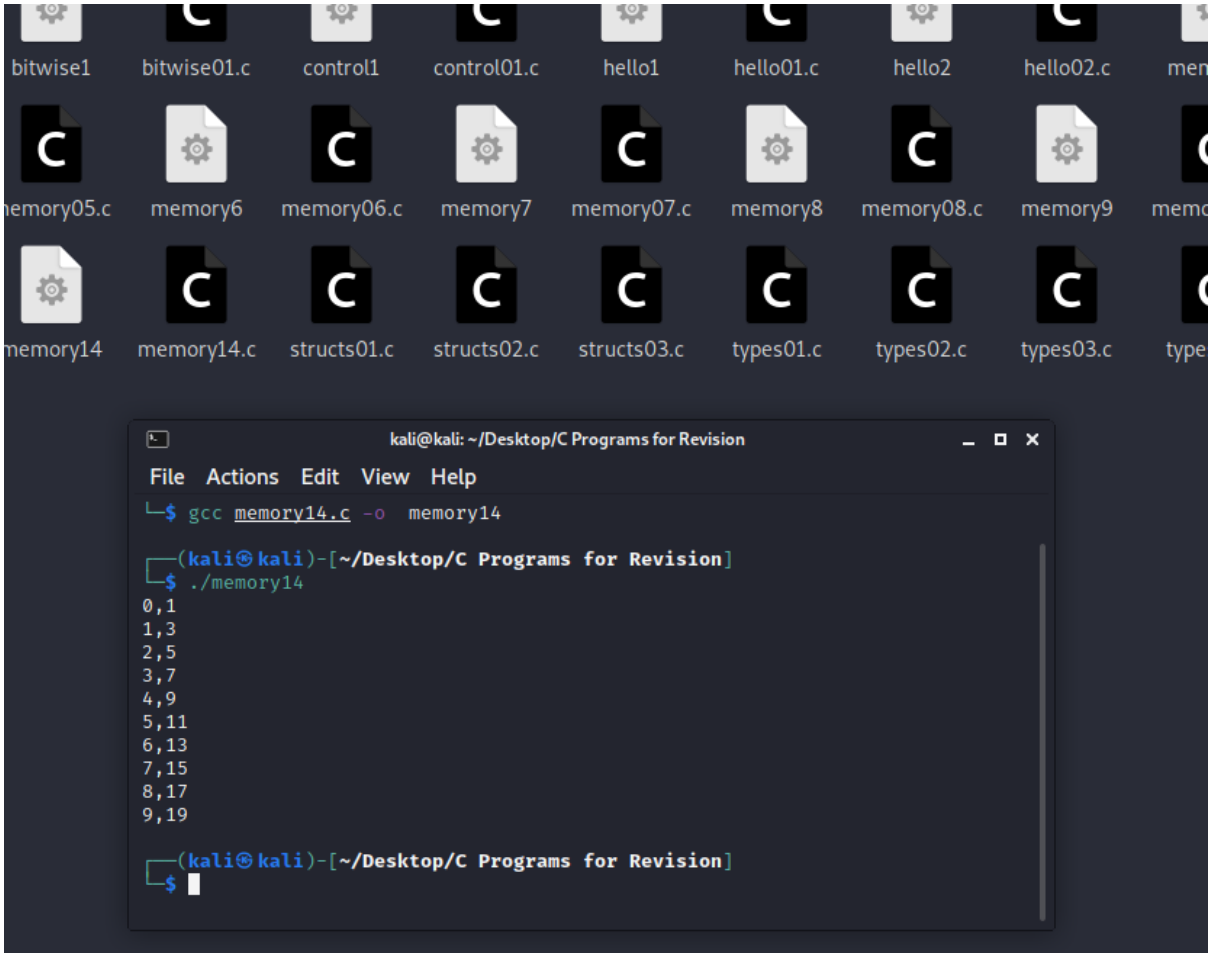
```
    *w = *w + 1;
    w++;
  }
}

int main() {
  int i;
  int *x, *y;
  x = malloc(sizeof(int) * n);
  y = x;

  for(i=0;i<n;i++){
    *y = 2 * i;
    y++;
  }

  inc(x);
  y = x;

  for(i=0;i<n;i++){
    printf("%d,%d\n", i, *y);
    y++;
  }
  free(x);
  return EXIT_SUCCESS;
}
```



18. memory14

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

int n = 10;

void initialise(int *w) {
  int i;
  for(i=0;i<n;i++){
    *w = 2 * i;
    w++;
  }
}

void inc(int *w) {
```

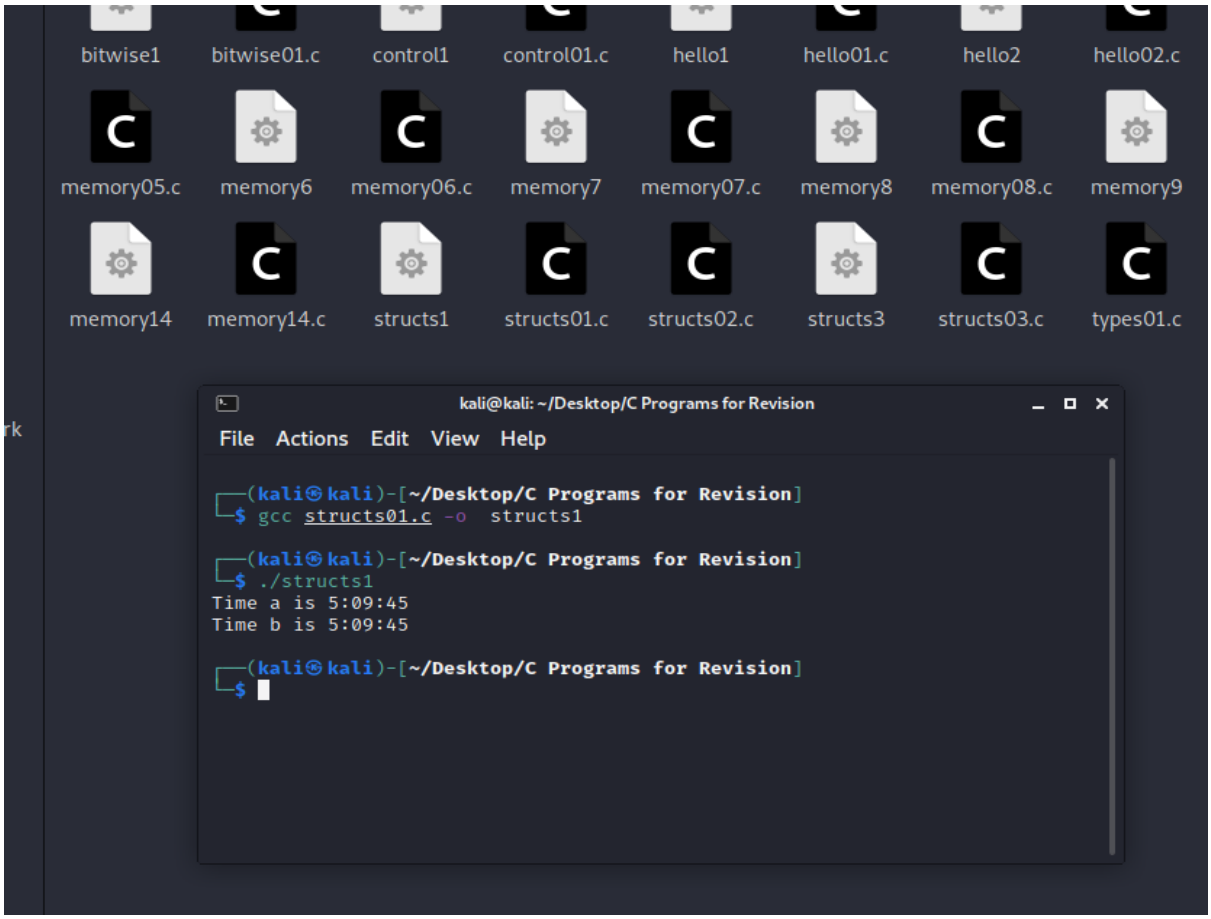
```
  int i;
  for(i=0;i<n;i++){
    *w = *w + 1;
    w++;
  }
}

void output(int *w) {
  int i;
  for(i=0;i<n;i++){
    printf("%d,%d\n", i, w[i]);
  }
}

int main() {
  int *x;
  x = malloc(sizeof(int) * n);

  initialise(x);
  inc(x);
  output(x);



  free(x);
  return EXIT_SUCCESS;
}
```



19. structs01

```
#include <stdio.h>
struct t {
  unsigned int h;
  unsigned int m;
  unsigned int s;
};

int main() {
  struct t a;
  struct t *b;

  a.h = 5;
  a.m = 9;
```

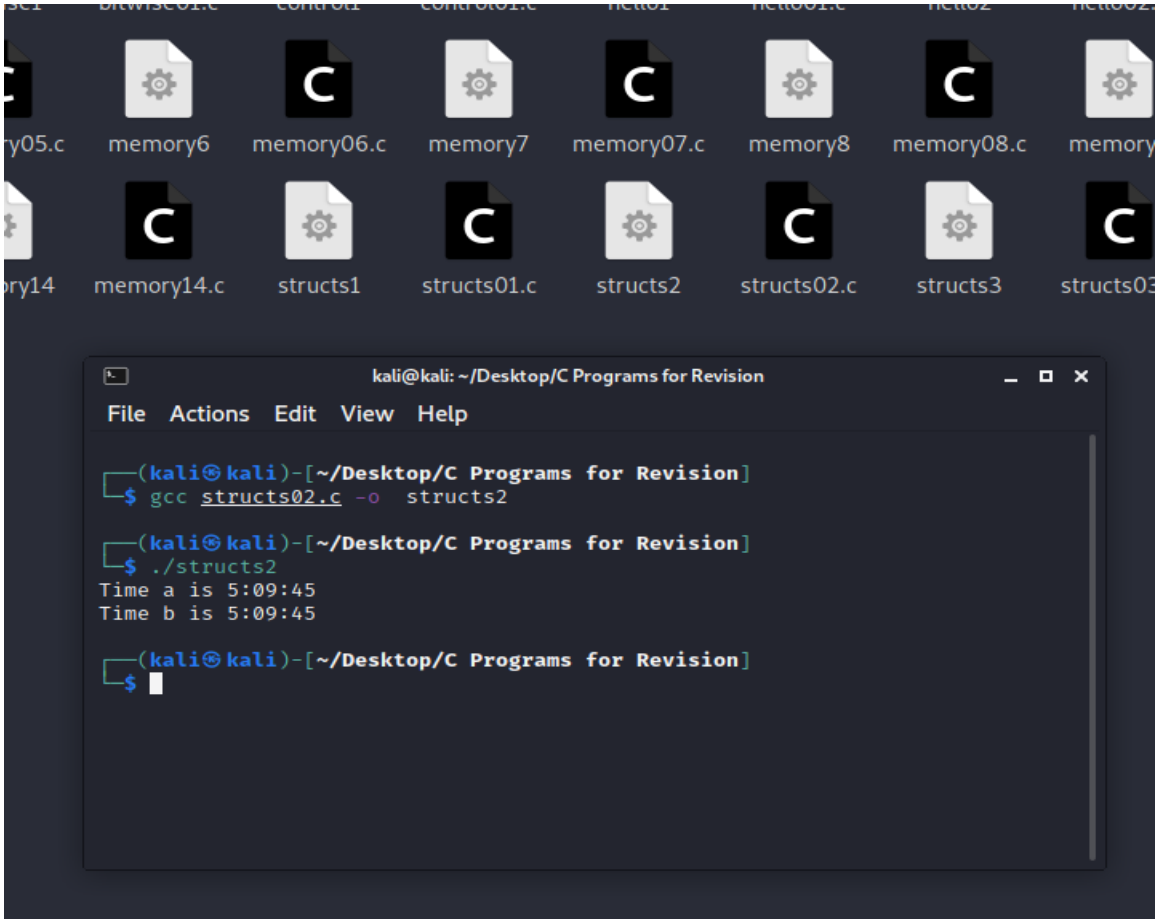
```
  a.s = 45;

  printf("Time a is %u:%02u:%02u\n", a.h, a.m, a.s);

  b = &a;
  printf("Time b is %u:%02u:%02u\n", b->h, b->m, b->s);

  return 0;
}
```



20. structs02

```
#include <stdio.h>

typedef struct {
  unsigned int h;
  unsigned int m;
```

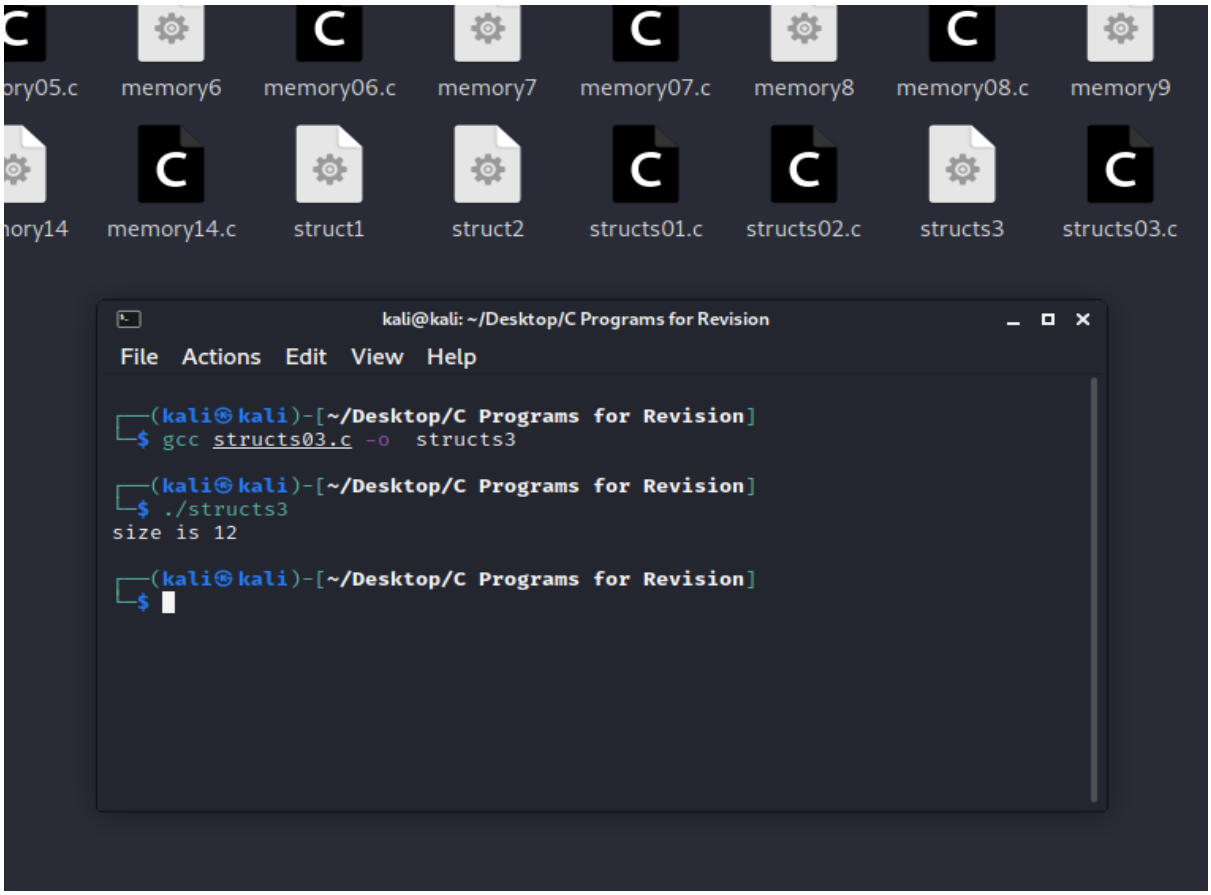
```
  unsigned int s;
} t;

int main() {
  t a;
  t *b;

  a.h = 5;
  a.m = 9;
  a.s = 45;

  printf("Time a is %u:%02u:%02u\n", a.h, a.m, a.s);

  b = &a;
  printf("Time b is %u:%02u:%02u\n", b->h, b->m, b->s);

  return 0;
}
```



21. structs03

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

typedef struct {
  unsigned int h;
  unsigned int m;
  unsigned int s;
} t;

int main() {
  t *a;

 a = (t *) malloc(sizeof(t));
```

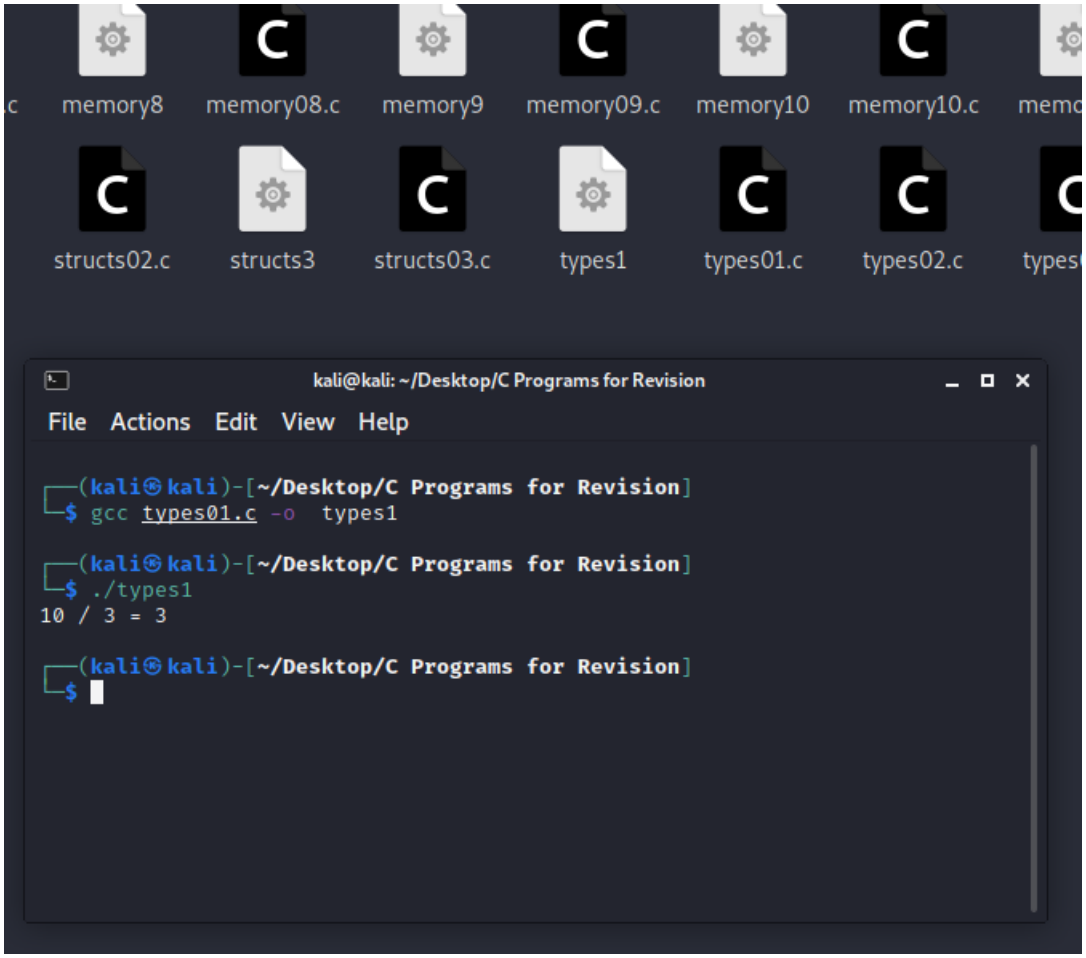
```
  a->h = 5;
  a->m = 9;
  a->s = 45;
  //printf("Time a is %u:%02u:%02u\n", a->h, a->m, a->s);

  printf("size is %d", sizeof(t));

  //free(a);
  return 0;
}
```



22. types01

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

int main() {
```

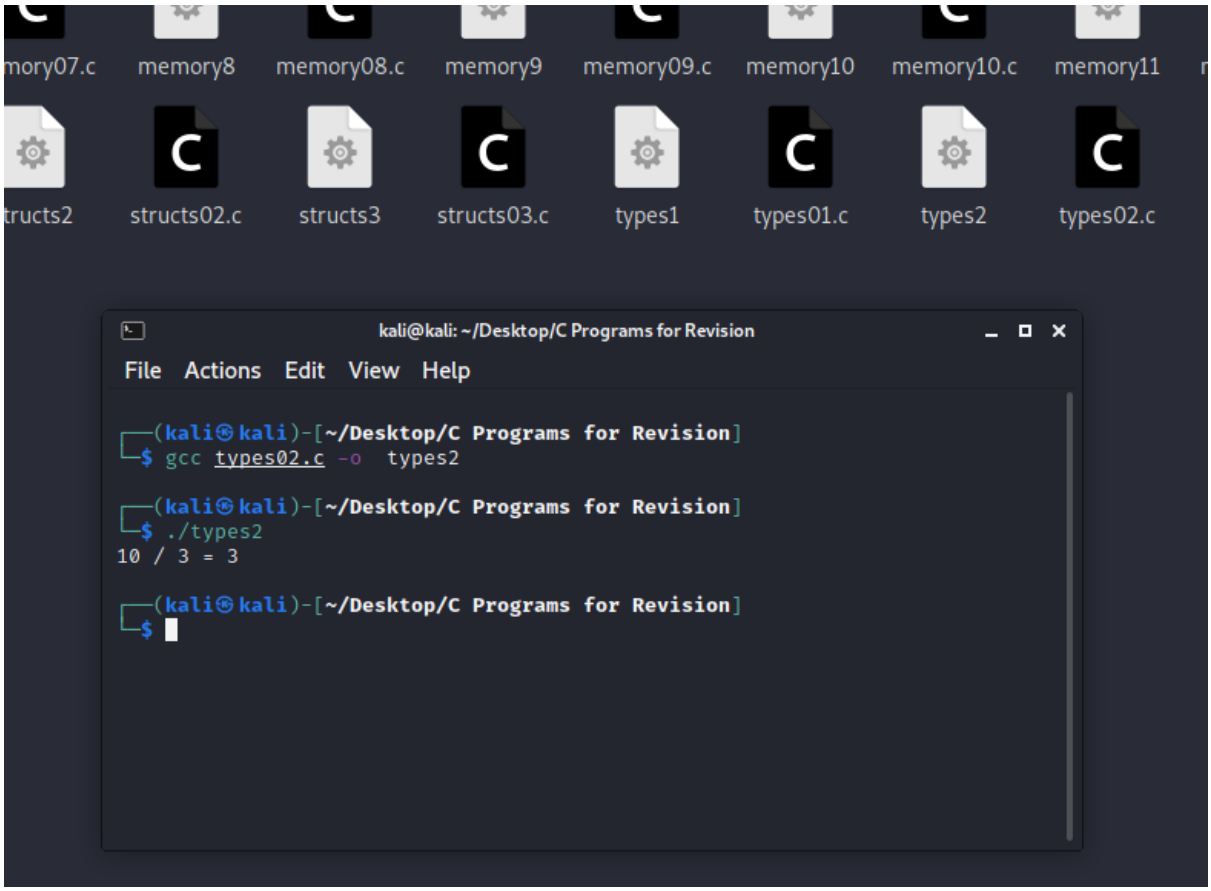
```
  int x = 10;
  int y = 3;

  printf("%d / %d = %d\n", x, y, x/y);
  return EXIT_SUCCESS;
}
```



23. types02

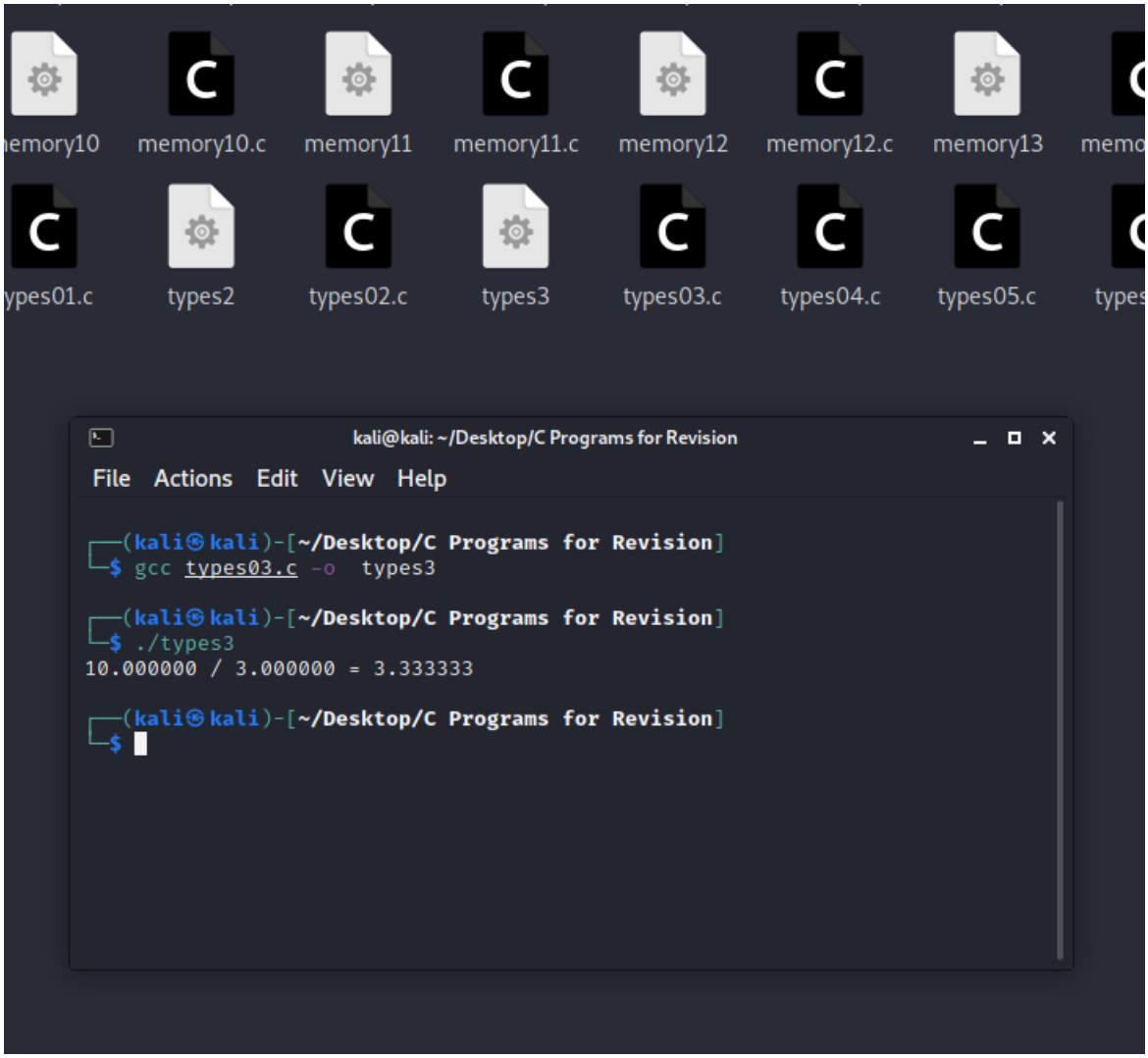
```
#include <stdlib.h>
#include <stdio.h>

int main() {
  long int x = 10L;
  long int y = 3L;
```

```
  printf("%ld / %ld = %ld\n", x, y, x/y);
  return EXIT_SUCCESS;
}
```



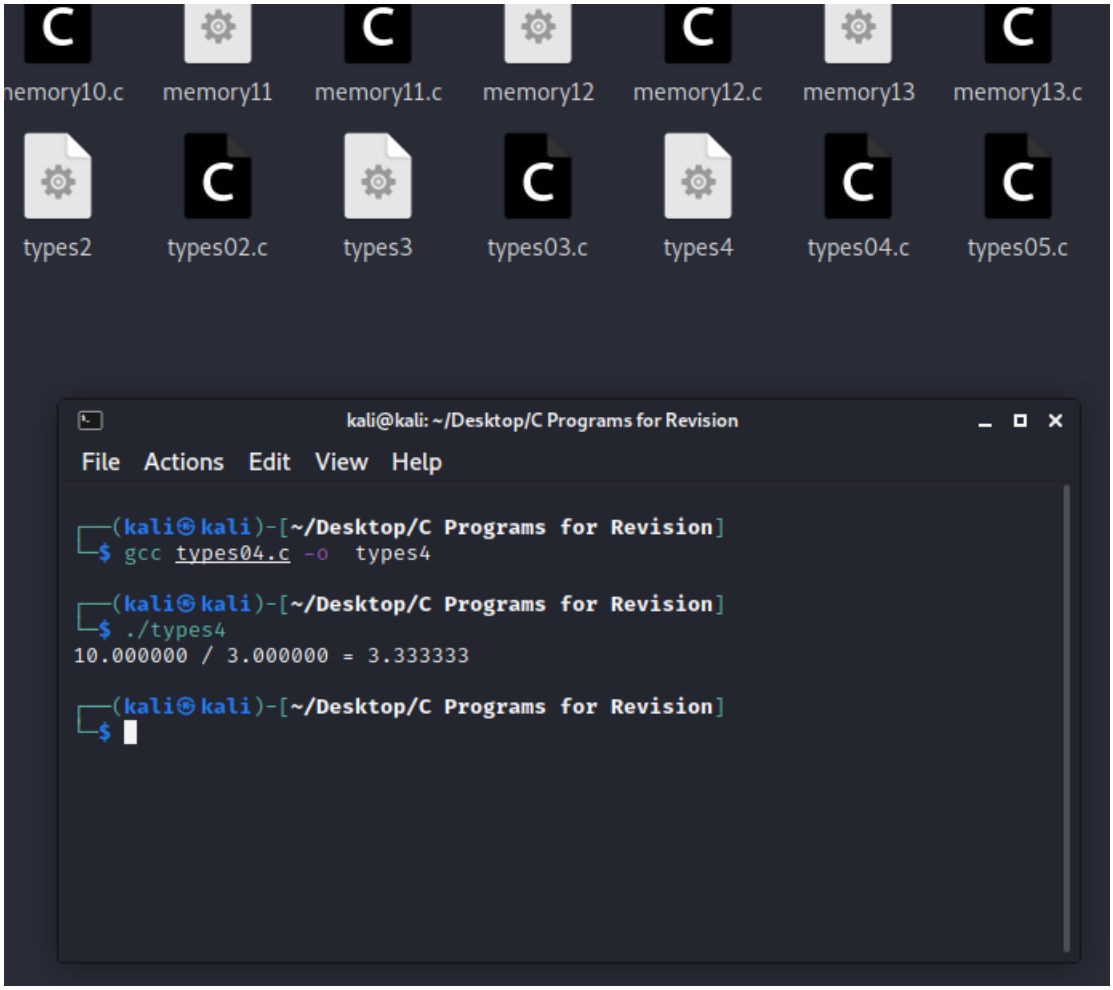
24. types03

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

int main() {
  float x = 10.0f;
  float y = 3.0f;

  printf("%f / %f = %f\n", x, y, x/y);
  return EXIT_SUCCESS;
}
```



25. types04

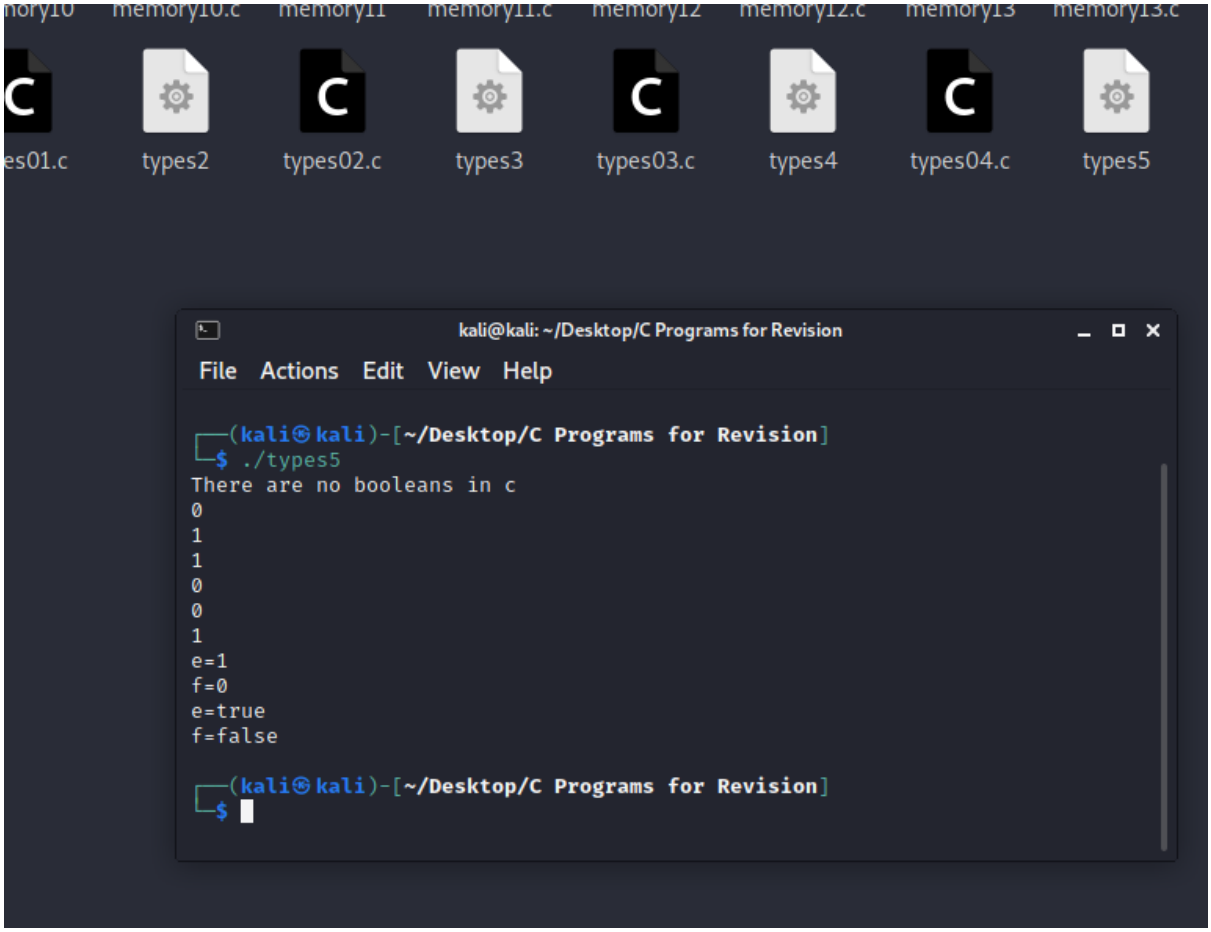
```
#include <stdlib.h>
#include <stdio.h>

int main() {
  double x = 10.0;
  double y = 3.0;

  printf("%lf / %lf = %lf\n", x, y, x/y);
  return EXIT_SUCCESS;
}
```



26. types05

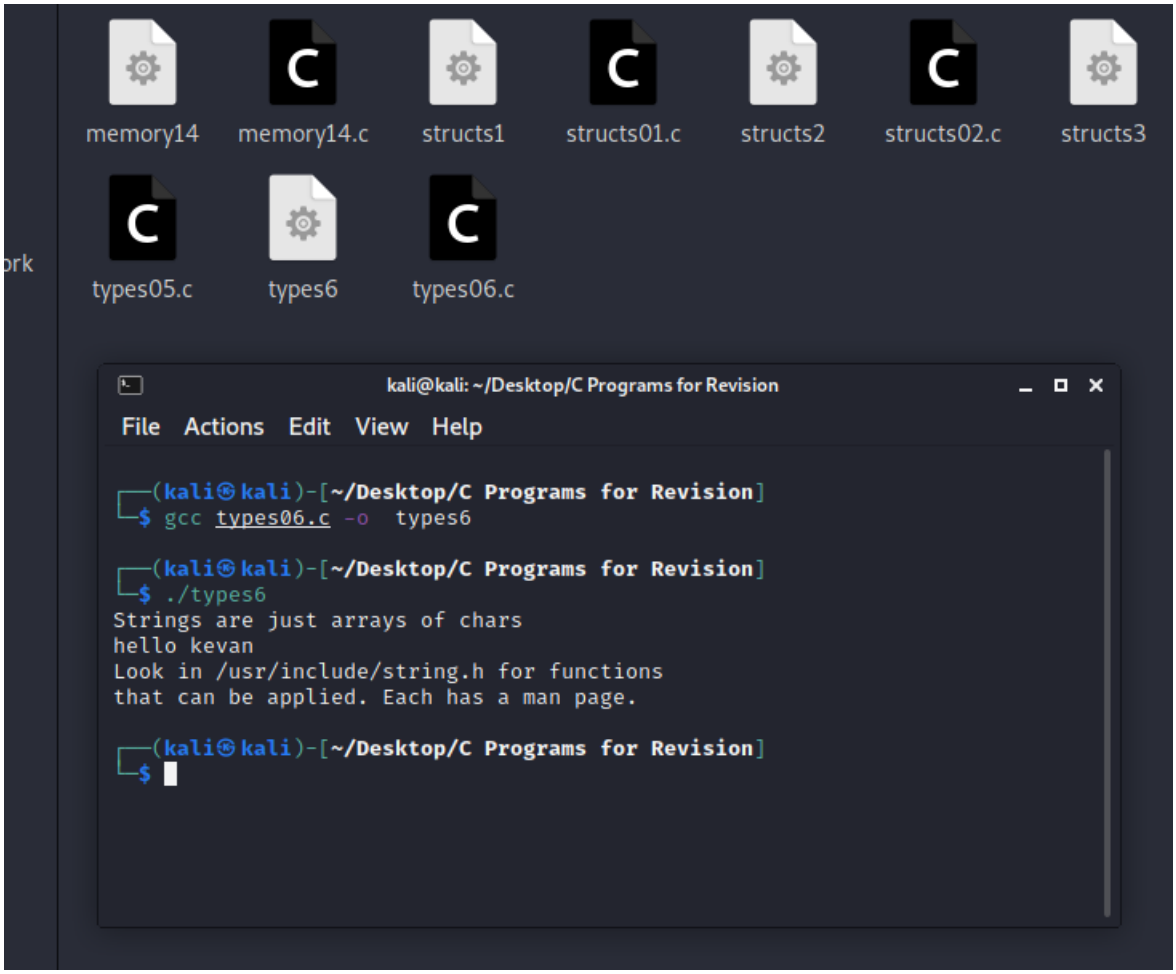
```
#include <stdlib.h>
#include <stdio.h>

int main() {
  int a = 2;
  int b = 3;
  int c = 2;
  int d = 4;

  printf("There are no booleans in c\n");
  printf("%d\n", a==b);
  printf("%d\n", a==c);
  printf("%d\n", a!=b);
```

```
  printf("%d\n", a!=c);
  printf("%d\n", a==b);
  printf("%d\n", !(a==b));

  int e = (a == b) || (a == c);
  int f = (a == b) && (a == c);

  printf("e=%d\n", e);
  printf("f=%d\n", f);

  if(e) {
    printf("e=true\n");
  } else {
    printf("e=false\n");
  }

  if(f) {
    printf("f=true\n");
  } else {
    printf("f=false\n");
  }

  return EXIT_SUCCESS;
}
```



27. types06

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

int main() {
  printf("Strings are just arrays of chars\n");

  char *message1 = "hello";
  char *message2 = "kevan";

  printf("%s %s\n", message1, message2);
  printf("Look in /usr/include/string.h for functions\n");
  printf("that can be applied. Each has a man page.\n");
  return EXIT_SUCCESS;
}
```


memory14
memory14.c
structs1
structs01.c
structs2
structs02.c
structs3
types05.c
types6
types06.c
kali@kali: ~/Desktop/C Programs for Revision
File Actions Edit View Help
(kali㉿kali)-[~/Desktop/C Programs for Revision]
$ gcc types06.c -o types6
(kali㉿kali)-[~/Desktop/C Programs for Revision]
$ ./types6
Strings are just arrays of chars
hello kevan
Look in /usr/include/string.h for functions
that can be applied. Each has a man page.
(kali㉿kali)-[~/Desktop/C Programs for Revision]
$