C programming Tutorial

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Hello, World!

```c
#include<stdio.h>

int main()
{
   printf("Hello, World!\n");
   return 0;
}
```

```
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc hello.c
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out
Hello, World!
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

Data Types

```c
#include<stdio.h>

int main()
{
  int i = 3;
  float j = 3.14;
  char c = 'A';
  printf("The value of variable i is %d\n", i);
  printf("The value of variable j is %f\n", j);
  printf("The value of variable c is %c\n", c);
  return 0;
}
```

```
[psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc datatype.c
[psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out
The value of variable i is 3
The value of variable j is 3.140000
The value of variable c is A
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

Command line arguments

```c
#include<stdio.h>

int main(int argc, char *argv[])
{
  if(argc == 1){
    printf("%s\n", argv[0]);
  }
  if(argc > 1){
    for(int i = 0; i < argc; i++)
      printf("%s\n", argv[i]);
  }
  return 0;
}
```

```
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc cmd_line_args.c
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out 1 2 hi bye
./a.out
1
2
hi
bye
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

Functions

```c
#include<stdio.h>

float compute_area(int r)
{
  float area = 3.14 * r * r;
  return area;
}

int main()
{
  int r = 2;
  float a = compute_area(r);
  printf("The area is %f\n", a);
  return 0;
}
```

```
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc func.c
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out
The area is 12.560000
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

Pass by value

```c
#include<stdio.h>

int decrement(int a){
  a--;
  return a;
}

int main()
{
  int i = 100;
  decrement(i);
  printf("%d\n", i);
  i = decrement(i);
  printf("%d\n", i);
  return 0;
}
```

```
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc pass_by_value.c
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out
100
99
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

Array

```c
#include<stdio.h>

int main()
{
  int a[5];
  for(int i =0; i < 5; i++){
    a[i] = i + 1;
  }
  for(int i =0; i < 5; i++){
    printf("%d\n", a[i]);
  }
  return 0;
}
```

```
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc array.c
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out
1
2
3
4
5
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

String

```c
#include<stdio.h>
#include<string.h>

int main()
{
  char a[6] = "apple";
  int length = strlen(a);
  printf("The length of string %s is %d\n", a, length);
  return 0;
}
```

```
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc string.c
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out
The length of string apple is 5
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

Practice 1

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

int main(int argc, char *argv[])
{
  if(argc < 2){
    printf("Error : too few arguments\n");
    return -1;
  }

  int lines = atoi(argv[1]);
  int i = 0;
  while(i < lines){
    for(int j = 0; j <= i; j++)
      printf("*");
    printf("\n");
    i++;
  }
  return 0;
}
```

```
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc pattern.c
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out 10
*
**
***
****
*****
******
*******
********
*********
**********
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

Practice 2

```c
#include<stdio.h>
#include<string.h>

int main()
{
  char a[6] = "apple";
  int i = 0;
  printf("%s\n", a);
  while(a[i] != '\0'){
    a[i] = a[i] - 32;
    i++;
  }
  printf("%s\n", a);
  return 0;
}
```

```
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc strfun.c
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out
apple
APPLE
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

String and pointer

```c
#include<stdio.h>
#include<string.h>

int main()
{
   char a[30] = "apple";
   char *p = a;
   printf("%s %s\n", a, p);
   while(*p != '\0'){
      *p = *p - 32;
      p++;
   }
   printf("%s %s\n", a, p);
   return 0;
}
```

```
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ gcc strfun2.c
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $ ./a.out
apple apple
APPLE
psandh3@teaching ~/fall2018_comp206_tutorial/tutorial2 $
```

Keep Exploring !