Problem Solving through Programming in C
Week 05 Assignment Solution

1. Which looping construct is best when the number of iterations is known beforehand?

    a) while loop
    b) do-while loop
    c) for loop
    d) all of the above

Solution: (c) for loop

The for loop is generally used when the number of iterations is known, as it allows initialization, condition, and increment/decrement in one line.

2. In a 'do-while' loop, when is the condition tested?

    a) Before the first iteration
    b) After the first iteration
    c) At the middle of each iteration
    d) At the end of each iteration

Solution: (d) At the end of each iteration

3. Which for loop has range of similar indexes of ‘i’ used in for (i = 0;i < n; i++)?
    a) for (i = n; i>0; i–)
    b) for (i = n; i >= 0; i–)
    c) for (i = n-1; i>0; i–)
    d) for (i = n-1; i>-1; i–)

Solution: (d) i will be ranging from 0 to n-1 in both the cases.

4. What is the output of the following code?

```
#include <stdio.h>
int main() {
  for(i = 0;i < 10; i++);
  printf("%d", i);
  return 0;
}
```

    a) 10
    b) 0123456789
    c) Infinite loop, no output
    d) Syntax error

Solution: (a) 10

Due to semicolon(;) at the end of the for loop, after 10 iterations for loop will be terminated and the result will be 10.

5. Find the output of the following C program

```
#include <stdio.h>
int main()
{
int i = 0;
   if(i==0)
```

```
    {
   i=i+1;
   break;
   }
   printf("%d",i);
   return 0;
}
```

a) 0
b) 1
c) No output
d) Compiler error

Solution: (d) Break statement is applicable in loop and switch statements. It is not allowed inside if statement. Thus the program will show compiler error.

6. What is the output of the following C program?

```
#include <stdio.h>
int main()
{
   int a = 0, i, b;
   for (i = 0; i <= 2; i+= 0.5)
   {
      a++;
      continue;
   }
   printf("%d",a);
   return 0;
}
```

a) 5
b) 4
c) 1
d) No output

Solution: (d) As i is initialized as an integer variable, integer value of i after the operation (i=i+0.5) will be zero. Thus, the loop will never be ended and the control will not come to the printf statement at all. So, nothing will be printed.

7. What will be the output?

```
#include <stdio.h>
int main()
{
int i=0;
for(;;)
   {
      if(i==10)
         break;
    printf("%d ",++i);
   }
   return 0;
}
```

a) Syntax error
b) 0 1 2 3 4 5 6 7 8 9 10

c) 1 2 3 4 5 6 7 8 9 10
d) 0 1 2 3 4 5 6 7 8 9

Solution: (c)

for(; ;) is possible in c, there is no need to place condition with in the for(), you can place condition within the body of the loop. The ++i makes it printing from 1 to 10.

8. If the following loop is implemented

```
#include <stdio.h>
int main() {
int num = 0;
do {
- - num;
printf("%d", num);
num ++;
}
while(num >= 0);
return 0;
}
```

a) A run time error will be reported
b) The program will not enter into the loop
c) The loop will run infinitely many times
d) There will be a compilation error reported

Solution: (c) The loop will run infinitely many times

9. What is the output of the below C program?

```
#include <stdio.h>
int main()
{
   short int k=1,j=1;
   while (k <= 4 || j <= 3)
   {
                    k=k+2;
                    j+=1;
   }
printf("%d,%d",k,j);
return 0;
}
```

a) 5,4
b) 7,4
c) 5,6
d) 6,4

Solution: (b) The loop will be continued till any of the condition k<=4 or j<=3 is satisfied. So, the loop will be executed 3 times. Thus, the value of k and j would be 7 and 4.

10. How many times is the loop executed in the following code?

```
for (int i = 0; i <= 10; i += 2) {
    printf("%d ", i);
```

```
}
```

a) 5
b) 6
c) 10
d) 11

Solution: (b) The loop starts at 0 and increments by 2 each time until it reaches 10, inclusive. The values of i would be 0, 2, 4, 6, 8, 10.