```
#include <iostream>
#include <cstdlib>
#include <cerrno>
#include <unistd.h>
#include <fcntl.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <time.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <sstream>
#include <pwd.h>
#include <ctype.h>

using namespace std;

/**
@param argc the number of arguments
@param argv char array of arguments
function that prints out the specified number of lines of a file
*/
int main(int argc, char * argv[])
{
  bool n = false;
  bool difOutput = false;
  int c;


  while((c = getopt(argc, argv, "n")) != -1)
    {
      switch(c)
        {
        case 'n':
          n = true;
          break;

        default:
          return EXIT_FAILURE;

        }
    }

  if(argc == 1) //just ./head - read from standard input
    {
      int n =0;
      int numLines = 0;
      char buffer[100000];
      while((n = read(0, buffer, 1024)) > 0)
      {
        buffer[n] = '\0';
        write(STDOUT_FILENO,buffer,n);
        numLines ++;
        for(int i = 0; i < 1024; i++)
```

```
        {
          buffer[i] = '\0';
        }

      if(numLines == 5)
        return EXIT_SUCCESS;
    }
  }

else if(n && (argc == 2 || argc == 3)) //n specified without file, error
  {
    {
    cout << "head: option requires an argument -- 'n'" << endl;
    cout << "Try 'head --help' for more information." << endl;
    return EXIT_FAILURE;
    }
  }

else //correct input
  {
    for(int i = 1; i < argc; i++)
    {
      if(strcmp(argv[i], "-") == 0)
        {
          difOutput = true;
        }
    }


    if(!n)
    {
      for(int i = 1; i < argc; i++)
        {
          char * filename = argv[i];
          if (strcmp(filename, "-") == 0)
          {
            int n =0;
            int numLines = 0;
            char buffer[100000];
            if(difOutput)
              {
                cout << "==> standard input <==" << endl;
              }
            while((n = read(0, buffer, 1024)) > 0)
              {
                buffer[n] = '\0';
                write(STDOUT_FILENO,buffer,n);
                numLines ++;
                for(int i = 0; i < 1024; i++)
                {
                  buffer[i] = '\0';
                }

                if(numLines == 5)
```

```
                break;
              }

            }
            else
            {
              int fd = open(filename, O_RDONLY); //don's forget to close
              if (fd != -1)
                {
                  char buffer [100000];
                  int n = 0;
                  if(difOutput)
                  {
                    cout <<"==> " <<filename<< " <=="<< endl;
                  }
                  while ((n = read(fd, buffer, 1024)) > 0)
                  {
                    buffer[n] = '\0';
                    write(STDOUT_FILENO, buffer, n);
                    for(int j = 0; j < 1024; j++)
                      {
                        buffer[j] = '\0';
                      }
                    cout << '\n';
                  }
                  close(fd);
                }
              else
                {
                  cout << "Could not open " << filename << "\nerror: " <<
strerror(errno) << endl;
                  cout << '\n';
                }
            }
          }
      }
      else //n specified
      {
        char * end;
        int num = atoi(argv[2]);

          if(num == 0 && argv[2] != "0")
            {
            cout << "head: " << argv[2] <<": invalid number of lines" <<endl;
            return EXIT_FAILURE;
            }
        else
          {
            for(int i = 3; i < argc; i++)
            {
              char * filename = argv[i];
              if (strcmp(filename, "-") == 0)
                {
                  int n =0;
```

```
    int numLines = 0;
    char buffer[100000];
    if(difOutput)
    {
      cout << "==> standard input <==" << endl;
    }
    while((n = read(0, buffer, 1024)) > 0)
    {
      buffer[n] = '\0';
      write(STDOUT_FILENO,buffer,n);
      numLines ++;
      for(int i = 0; i < 1024; i++)
        {
          buffer[i] = '\0';
        }

      if(numLines == num)
        break;
    }

  }

else
  {
    int fd = open(filename, O_RDONLY); //don's forget to close
    if (fd != -1)
    {
      char buffer [100000];
      int n = 0;
      int index = 0;
      int numLines = 0;
      if(difOutput)
        {
          cout <<"==> " <<filename<< " <=="<< endl;
        }
      while ((n = read(fd, buffer, 100000)) > 0)
        {
          buffer[n] = '\0';
        }
      while(numLines != num)
        {
          cout << buffer[index];
          if(buffer[index] == '\0')
         break;
          else if(buffer[index] == '\n')
         numLines ++;
          index++;
        }
      for(int p = 0; p < 100000; p++)
        {
          buffer[p] = 0;
        }
      cout << '\n';
      close(fd);
```

```
                }
                else
                {
                  cout << "Could not open " << filename << "\nerror: " <<
strerror(errno) << endl;
                  cout << '\n';
                }
              }
            }
          }

      }//else n is specified
    } //else correct input
}//main
```