

Question 1:

```
#include <bits/stdc++.h>
```

```
std::vector<std::string> reserved = {"while", "for", "switch", "do", "return"};  
std::string inputStr;
```

```
bool number(std::string string) {  
    for (auto i : string) {  
        if (!isdigit(i)) {  
            return false;  
        }  
    }  
    return true;  
}
```

```
bool reserve(std::string string) {  
    auto it = std::find(reserved.begin(), reserved.end(), string);  
    if (it != reserved.end()) {  
        return true;  
    }  
    else {  
        return false;  
    }  
}
```

```
bool ident(std::string string) {  
    for (auto i : string) {  
        if (std::isalnum(i) || i == '_') {  
            continue;  
        }  
        else {  
            return false;  
        }  
    }  
    return true;  
}
```

```
int main() {  
    std::string inputStr;
```

```

bool isNum;
bool isIdent;
bool isRes;
bool flag = true;
while (flag) {
    std::getline(std::cin, inputStr);
    if ((int(inputStr[0]) >= 65) && (int(inputStr[0]) <= 122) || (inputStr[0] == '_')) {
        isNum = false;
        isRes = reserve(inputStr);
        isIdent = ident(inputStr);
    }
    else if (isdigit(inputStr[0])) {
        isIdent = false;
        isRes = false;
        isNum = number(inputStr);
    }

    if (isNum) {
        std::cout << inputStr << " is a number" << std::endl;
    }
    else {
        std::cout << inputStr << " is not a number" << std::endl;
    }
}
////////////////////
if (isIdent) {
    std::cout << inputStr << " is a identifier" << std::endl;
}
else {
    std::cout << inputStr << " is not a identifier" << std::endl;
}
////////////////////
if (isRes) {
    std::cout << inputStr << " is a reserved word" << std::endl;
}
else {
    std::cout << inputStr << " is not a reserved word" << std::endl;
}
std::cout << std::endl;
}

```

```
    return 0;  
}
```

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K-mart

K-mart is not a number

K-mart is not a identifier

K-mart is not a reserved word

23andMe

23andMe is not a number

23andMe is not a identifier

23andMe is not a reserved word

456

456 is a number

456 is not a identifier

456 is not a reserved word

Tax 2018

Tax 2018 is not a number

Tax 2018 is not a identifier

Tax 2018 is not a reserved word

While

While is not a number

While is a identifier

While is not a reserved word

switch

switch is not a number

switch is a identifier

switch is a reserved word

do\_it

do\_it is not a number

do\_it is a identifier

do\_it is not a reserved word

\_Fall\_20

\_Fall\_20 is not a number

\_Fall\_20 is a identifier

\_Fall\_20 is not a reserved word

\_Jan 19

\_Jan 19 is not a number

\_Jan 19 is not a identifier

\_Jan 19 is not a reserved word

Question 2:

```
#include <bits/stdc++.h>
```

```
int main() {
    int table[4][3] = {
        {0, 1, 2},
        {2, 1, 3},
        {0, 3, 3},
        {3, 3, 3}
    };

    std::string inputStr;
    std::string variable;
    std::string equalSign;
    std::cin >> variable >> equalSign >> inputStr;
    int finState1 = 1;
    int finState2 = 2;
    int currState = 0;

    for (auto i : inputStr) {
        if (i == 'a') {
            currState = table[currState][0];
        }
        else if (i == 'b') {
            currState = table[currState][1];
        }
        else if (i == 'c') {
            currState = table[currState][2];
        }
        else if (i == '$') {
            break;
        }
    }

    if (currState == finState1 || currState == finState2) {
        std::cout << variable << " is Valid" << std::endl;
    }
    else {
```

```
    std::cout << variable << " is Invalid" << std::endl;
}
return 0;
}
```

```
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COMPILER/Assignment
w1 = abbbcaaa$
w1 is Invalid
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w2 = ccccbbb$
w2 is Invalid
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COMPILER/Assignment
w3 = aabbaac$
w3 is Valid
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COMPILER/Assignment
```